

Learning and Labor.
LIBRARY
OF THE
University of Illinois.
CLASS. BOOK. VOLUME.
666.05 CL 27-28
Accession No.
REMOTE STORAGE



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVII, No. 1.

INDIANAPOLIS, IND., JANUARY, 1897.

\$2.00 a Year in Advance.

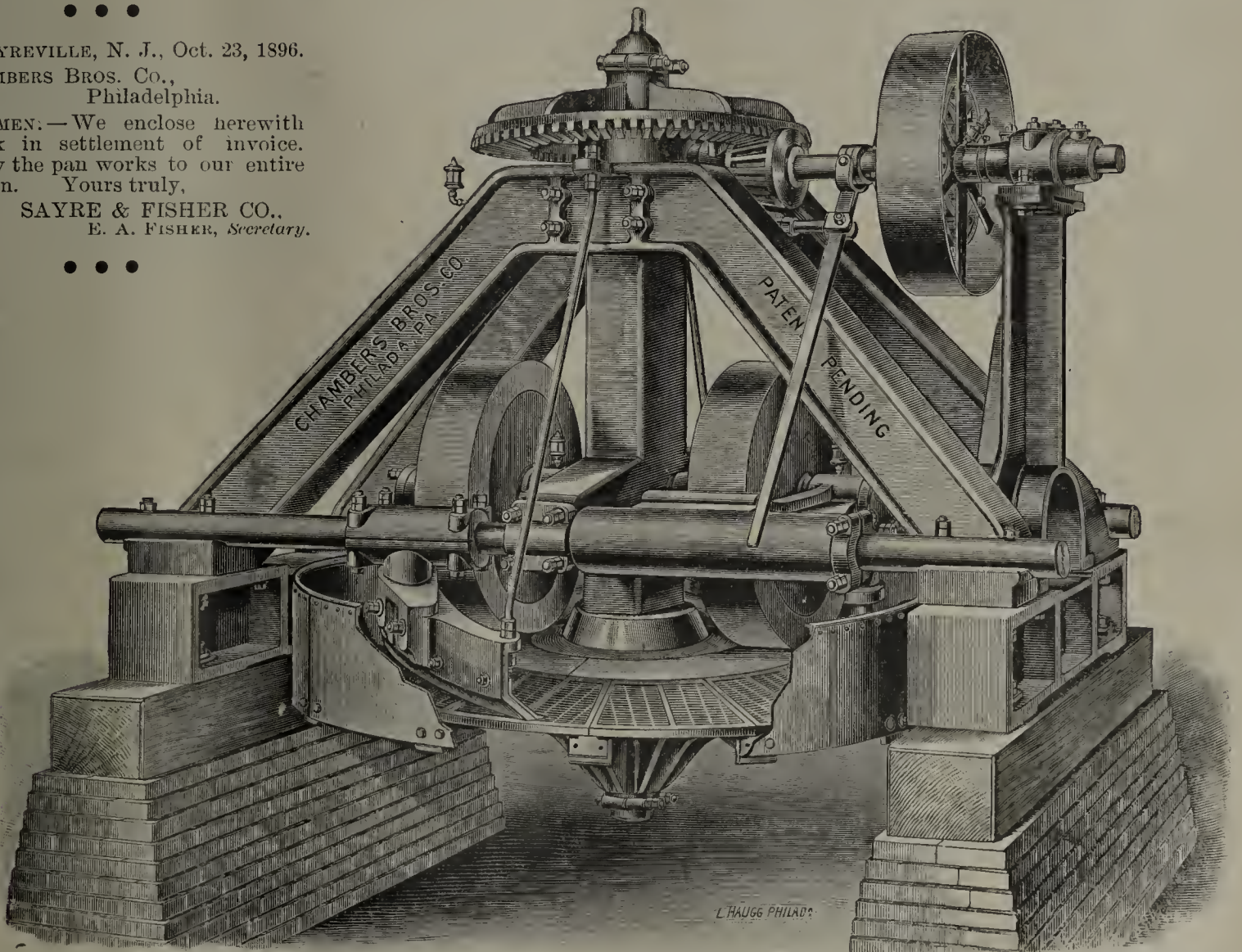
BRICK MAKING MACHINERY.

SAYREVILLE, N. J., Oct. 23, 1896.

THE CHAMBERS BROS. CO.,
Philadelphia.

GENTLEMEN:—We enclose herewith
our check in settlement of invoice.
Would say the pan works to our entire
satisfaction. Yours truly,

SAYRE & FISHER CO.,
E. A. FISHER, Secretary.



New Self-Contained All Iron and Steel Dry Pan. U. S. Pat. No. 511,380, Dec. 26, 1893.

Manufactured by

CHAMBERS BROTHERS CO.,

Fifty-Second Street, below Lancaster Avenue,

J. E. EASTES, Chicago Agent,
174 South Clinton Street.

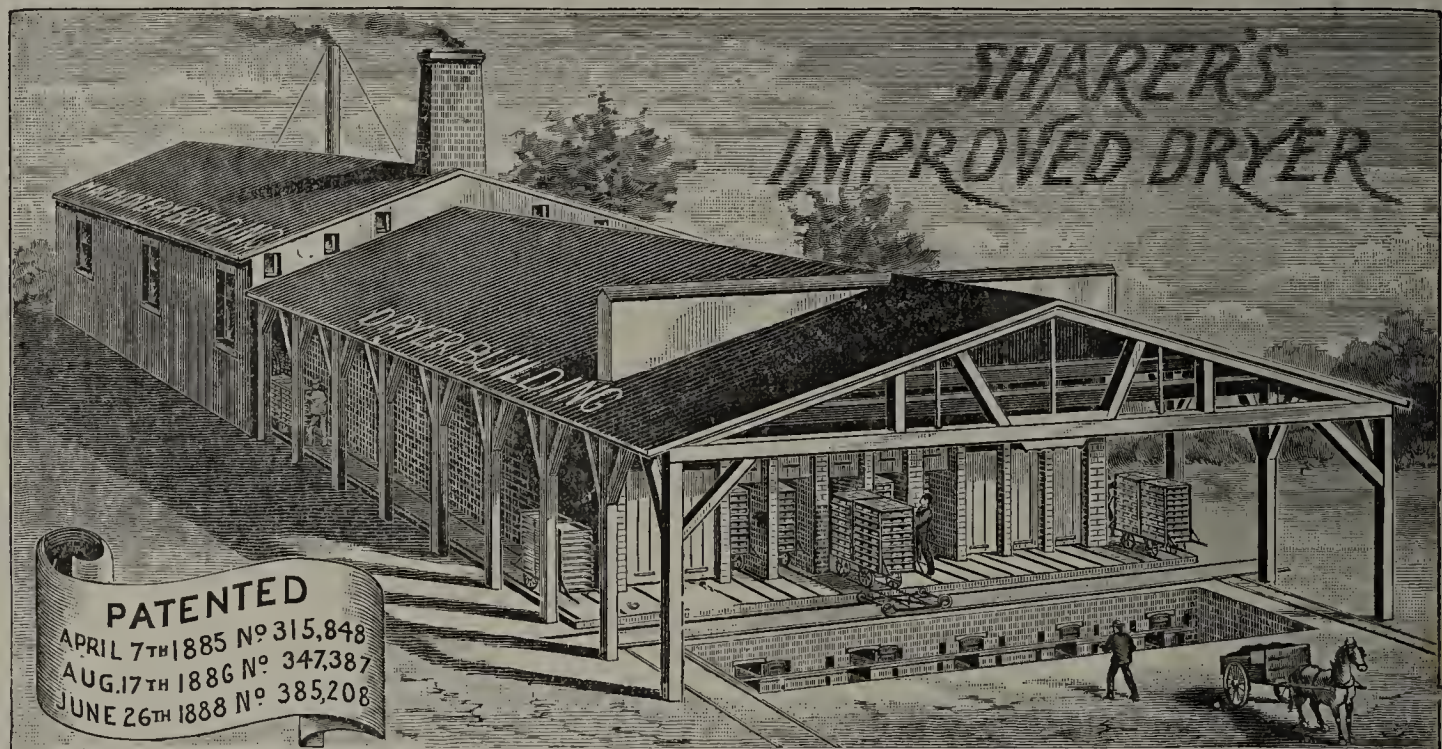
PHILADELPHIA, PA.

Geo. W. Sharer,

Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.

Sharer's Improved Dryer Saves Fuel, Saves Brick, Saves
Time, Saves Money.

Sharer's Improved Calorific Kiln Burns the Largest Per
Cent of Hard Brick at the Lowest Cost for Fuel.



ECONOMY is the Road to Success in all manufacturing lines particularly in brick-making. To insure the highest measure of success clayworkers must use the best and most economical appliances, for therein lies the key to a profitable business. Many years experience enables me to build and equip new brick plants or remodel old ones on practical lines that insures the largest and best output at the least expense.

Complete plants a specialty.

Clays tested and estimates furnished free of charge.

Address, **GEO. W. SHARER,**

2224 Tioga Street,

PHILADELPHIA, PENN.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.

IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

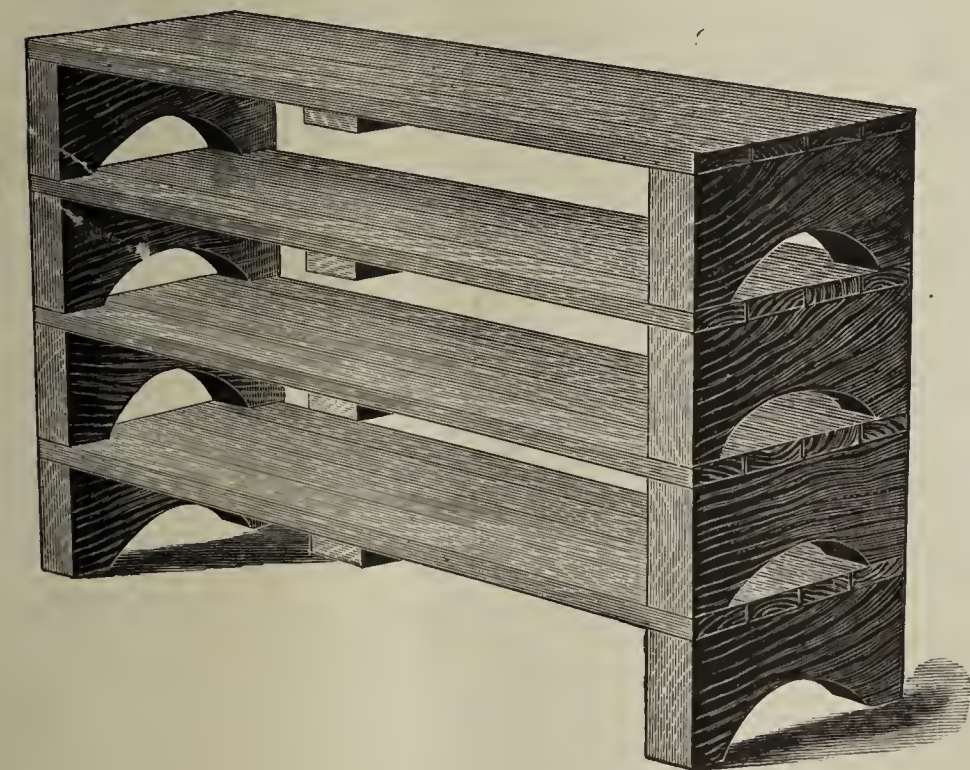
Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.



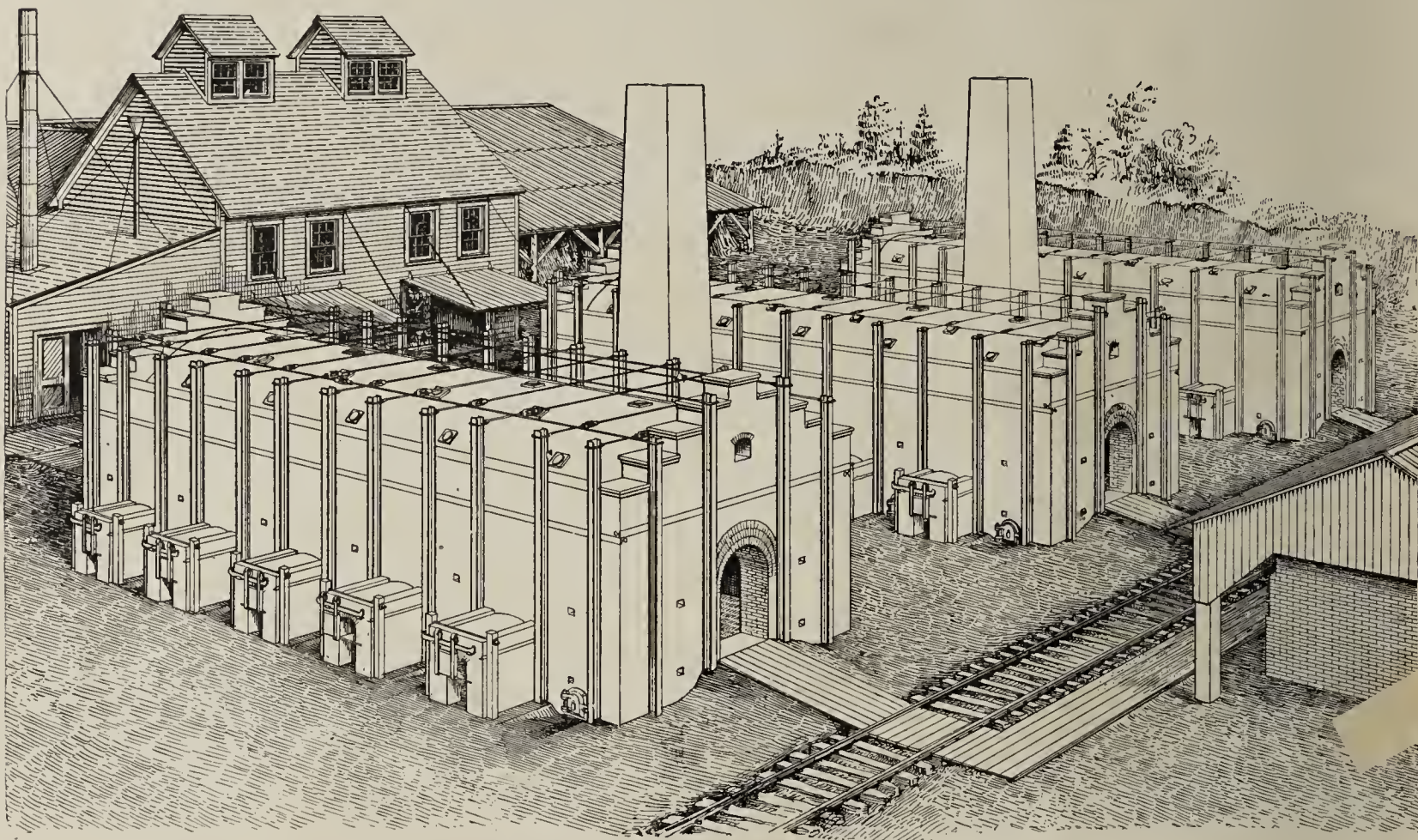
Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., = Saginaw, East Side, Mich.

A Modern Brick Plant

Brick Plants designed by us have the highest reputation for efficiency. They are modern, up-to-date, compact, convenient in arrangement, and not encumbered with unnecessary or useless machinery or appliances.

The Boyd Presses, Flood Up and Down Draft Kilns and Self-Contained Grinding Pans are money makers and money savers, first, last and all the time.



A SURE THING.—For Wise People.

We will construct and equip a Brick Plant of any capacity desired for any responsible party, furnishing Brick Presses, Power, Kilns, Clay-preparing Machinery, Shafting, Belts, etc., and erect the necessary Buildings. We will make and burn one or more kilns of brick, and turn the Plant over to him in proper working order under guarantee of satisfactory results as to quality of product and cost per 1,000; the loss to be ours in case of failure.

CHISHOLM, BOYD & WHITE CO.,

OFFICE AND WORKS:
57th and Wallace Streets.

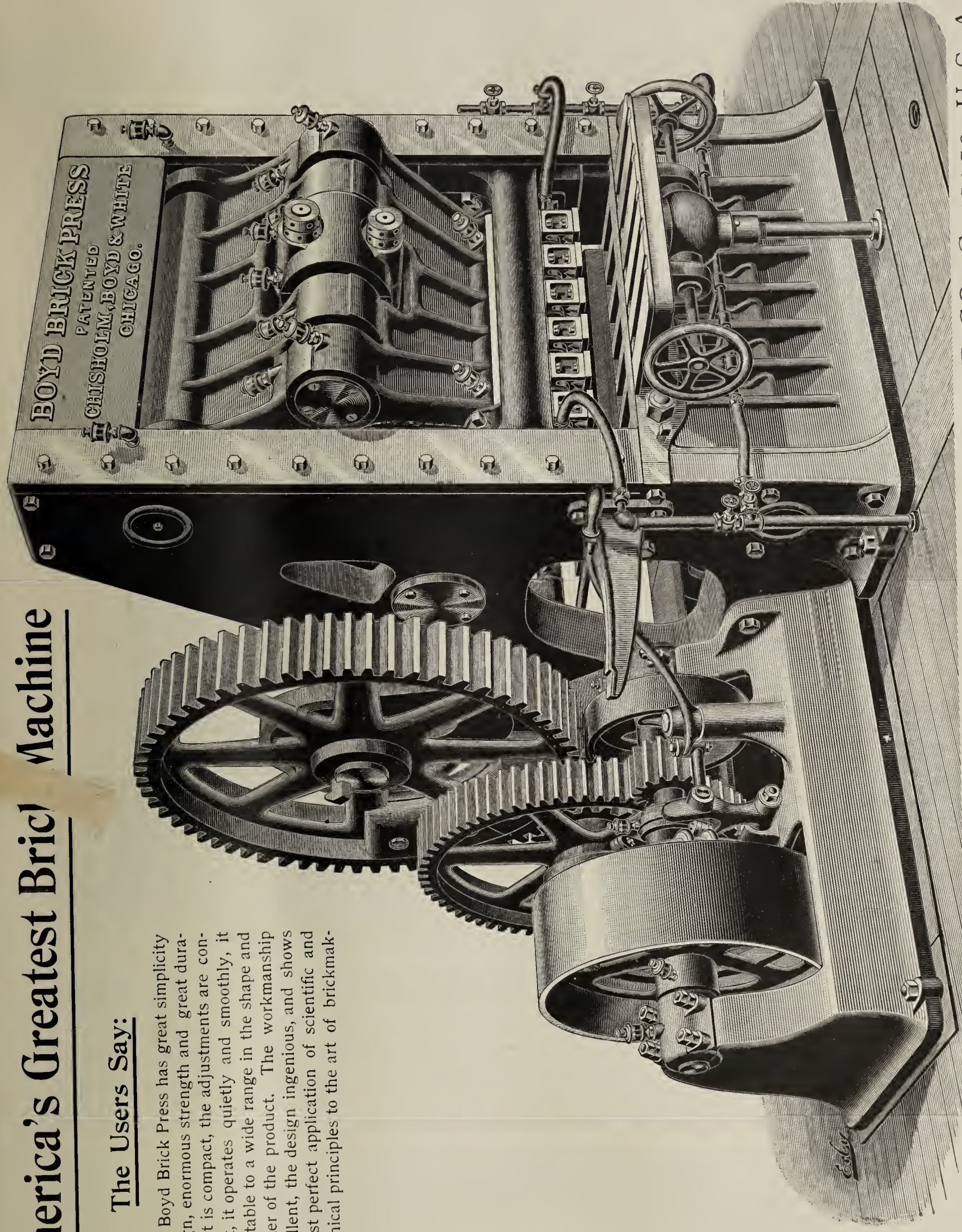
CABLE ADDRESS:
"CHISHOLM, CHICAGO,"
A. B. C. CODE USED.

CHICAGO, U. S. A.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

"NEMO ME IMPUNE LACESSIT."

Clay=Working Machinery.

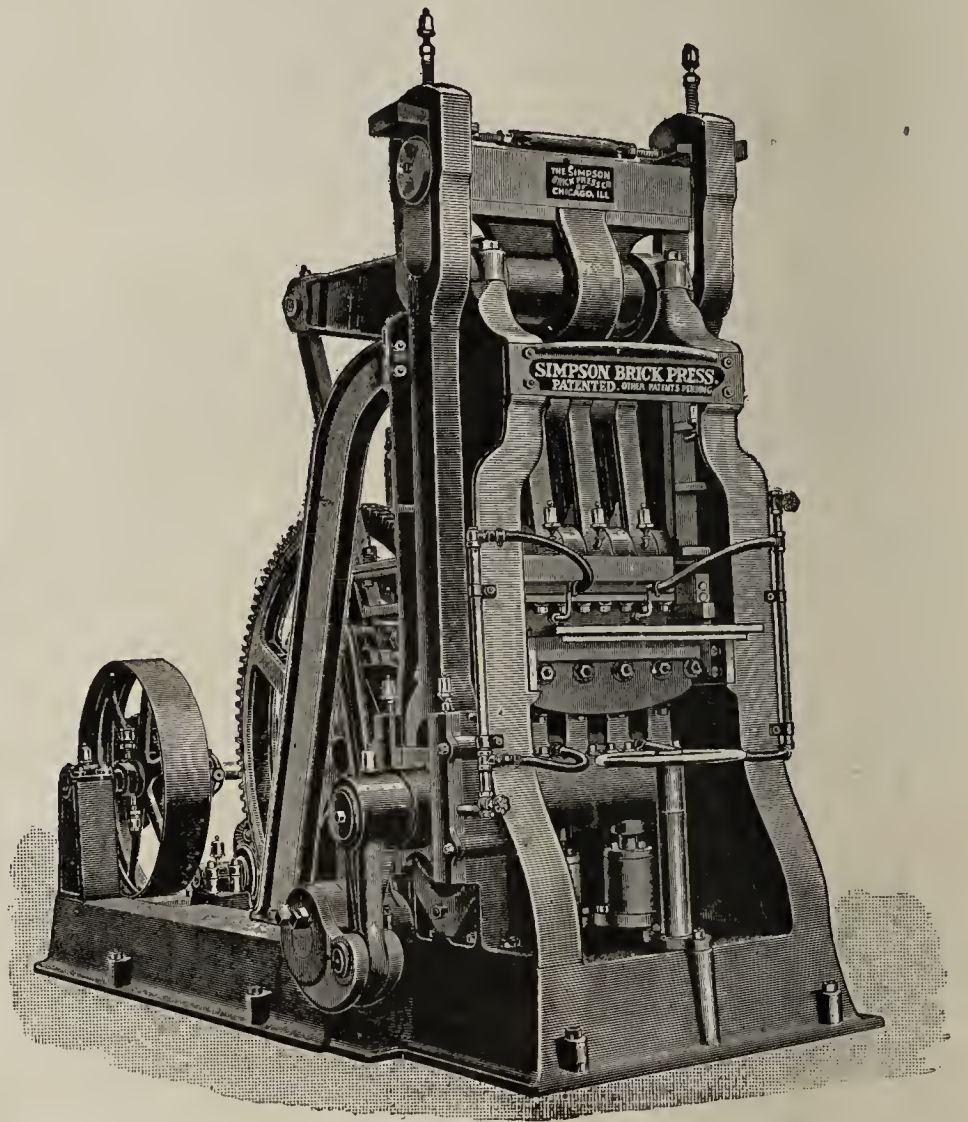
The
Simpson
Brick
Press Co.,

MANUFACTURERS OF THE

Simpson Brick Press,
Automatic Screens,
Clay Steamers,

And a Full Line
of Brickyard
Equipments. . .

Complete Plants
Constructed and
Guaranteed. . . .



OUR MACHINERY has long since passed the experimental stage, and is considered the standard by competent brickmakers.
Write for catalogues.

THE SIMPSON BRICK PRESS CO.,

Agents for Canada:

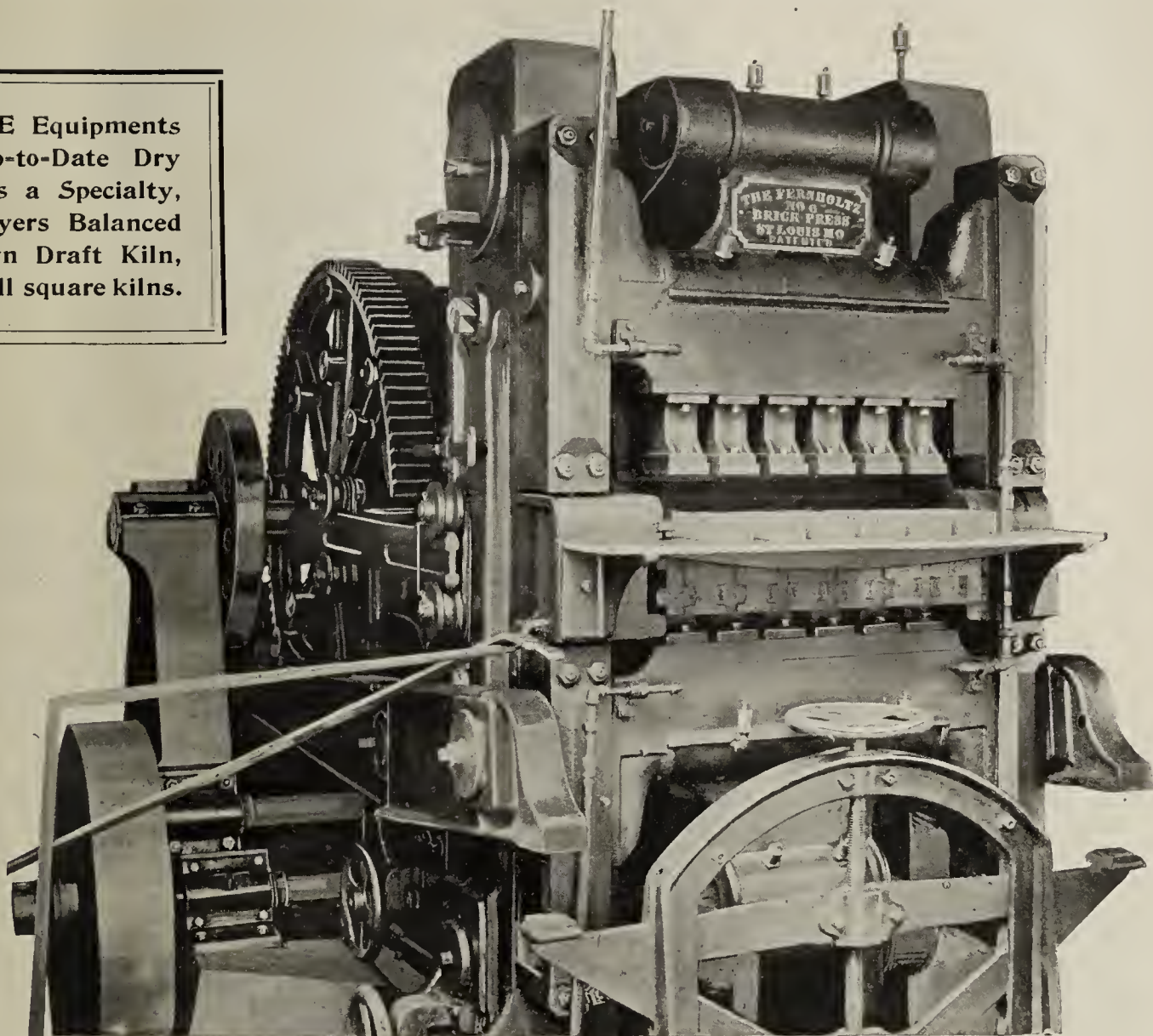
WATEROUS ENGINE WORKS CO.,
BRANTFORD, ONTARIO.

Chamber of Commerce
Chicago...

The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMPLETE Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

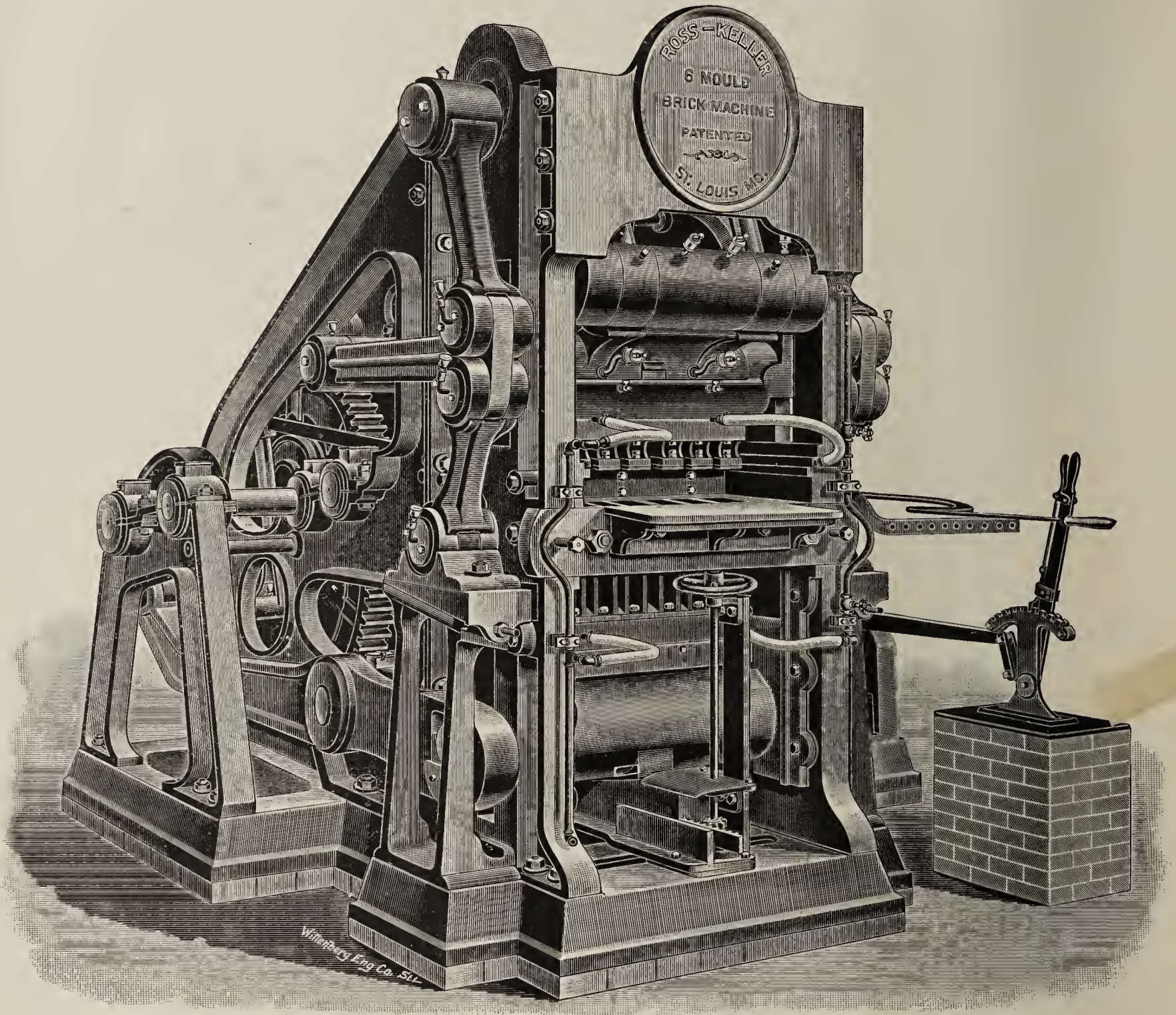
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

————— **BRICK SET IN KILN DIRECT FROM MACHINE.** —————



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

ST. LOUIS, MO., U. S. A.

"A Clay Pulverizer of Wonderful Capacity."

SO SAY ALL WHO HAVE USED IT.

St. Louis, Dec. 24, 1896.

Messrs. Milton F. Williams & Co.,

Gentlemen:-- We take pleasure in advising you of the very satisfactory service obtained from the Combined Crusher and Pulverizer bought from you six months ago, which we have used almost continuously on hard burnt clays. We find that it will pulverize much faster and finer than any grinding machine we have ever used, its capacity up to this time having been limited by the size of our screens. When we provide adequate screening attachment we are confident that the pulverizer will develop a capacity almost treble that of our old grinding pans.

Wishing you success, and with compliments of the season, we remain

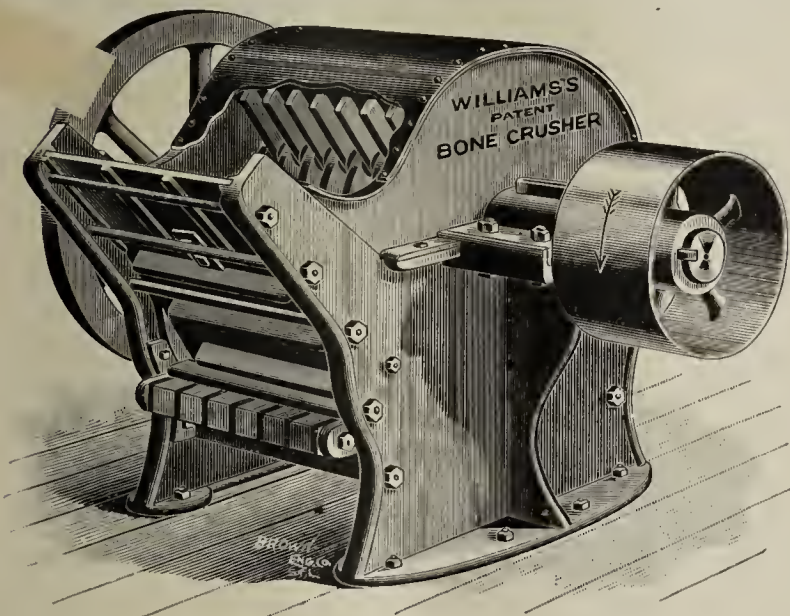
Yours truly,

J. B. CLEMENTS,

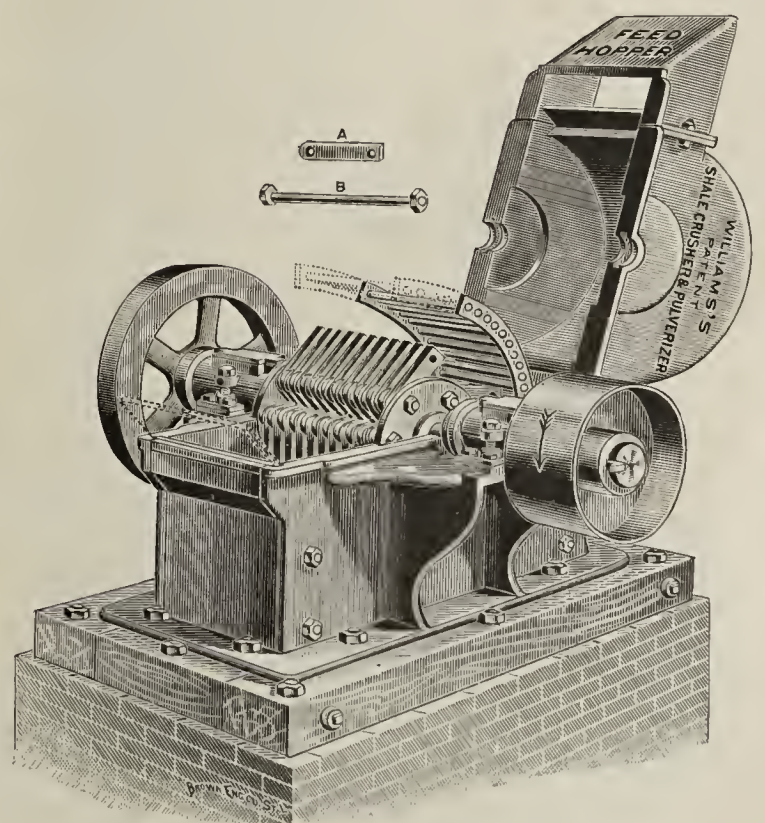
V.P. & Gen. Mgr. Christy Fire Clay Co.

We can send you many more like this.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER



Williams's Shale Breaker.



Williams's Shale and Clay Pulverizer.

THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

MILTON F. WILLIAMS & CO.,

2705 North Broadway, - - St. Louis, Mo.

Columbia Brick Press.

All working parts are made of Steel.

The pressure is exerted from both top and bottom; consequently there is no lateral strain on the machine.

The pressure is absolutely equal on top and bottom of brick.

A brick with granulation cannot be made on this machine.

The liners on mould can be taken out and replaced in five minutes, without removing any other part of the machine.

Any part of the gearing can be removed without taking machine apart.

The mould box can be taken out in a few minutes, without disturbing the other parts of machine.

The "COLUMBIA" presses clay or shale as dry as a hydraulic press, or so damp as to approximate a stiff mud brick, so that the range of products is from building brick to pavers. No other press does such a variety of work.

The "COLUMBIA" is the only brick press on the market that meets ALL the needs of a brick plant.

For circulars and prices, address

H. B. HILGEMAN,

General Agent "COLUMBIA Brick Press,
... and "COLUMBIA" Mould,

306 Oriel Building, ST. LOUIS, MO.

Terrazo Cement Tiles.

Complete Plants furnished for making the celebrated "TERRAZO" Tiles. Used to the exclusion of all other tiles in all floors, halls, etc., of the following among hundreds of structures in Germany:

JOHANNIS CHURCH, ROYAL AGRICULTURAL COURT, ROYAL DEPARTMENT OF THE INTERIOR, DRESDEN; GERMANIA PALACE, BERLIN AND ANHALT RAILROAD DEPOT, IMPERIAL ART AND MECHANICAL MUSEUM, ROYAL MILITARY ACADEMY, BERLIN; IMPERIAL POST OFFICES, DRESDEN, BERLIN AND
..... LEIPSIG.

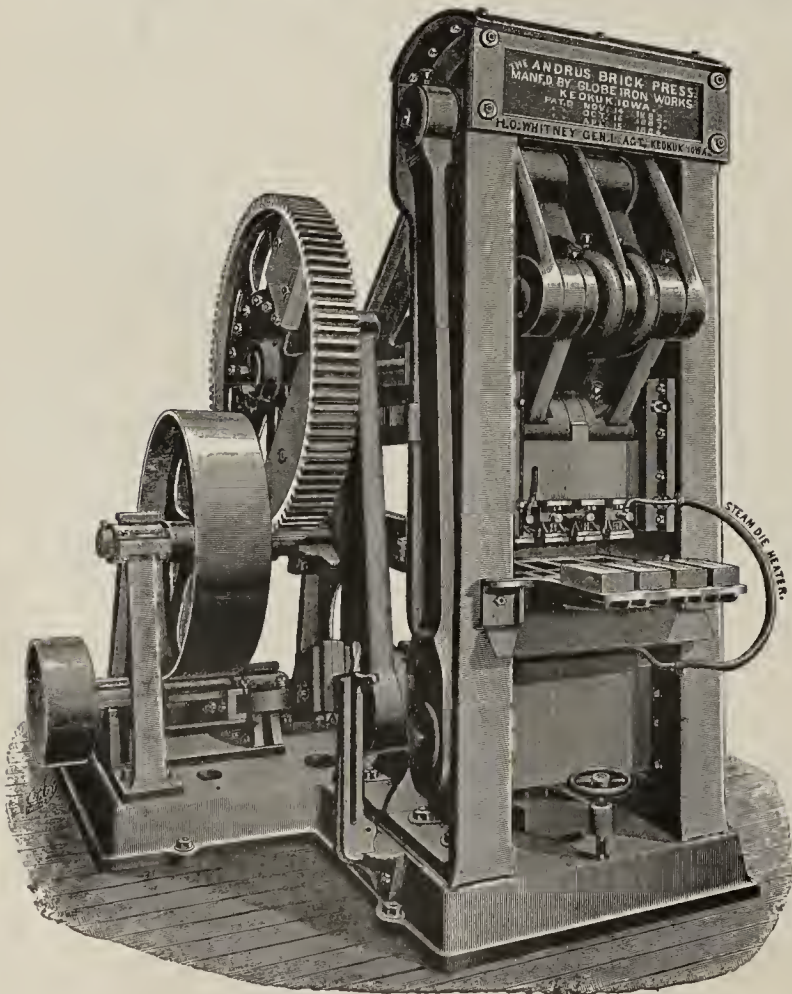
Terrazo Tiles, any color, design or size. For circulars, estimates, etc. Address

H. B. HILGEMAN,

General Agent of THEO. WELGE, for the sale of Dr. BERNHARDI SOHN, G. E. DRAENERT, GERMANY, Machinery and Processes for making TERRAZO CEMENT TILES.

306 Oriel Building, ST. LOUIS, MO.

THE ANDRUS DOUBLE PRESSURE BRICK PRESS.



We build at our Factory, Keokuk, Iowa, 2, 3 and 4-mold Andrus Presses.

They are the simplest and have the fewest wearing parts, and will accomplish all that the more complicated presses can accomplish, but with less friction and wear. Hence greater economy.

We guarantee them against breakage for Five Years.

Send for descriptive Catalogue, address

H. O. Whitney,

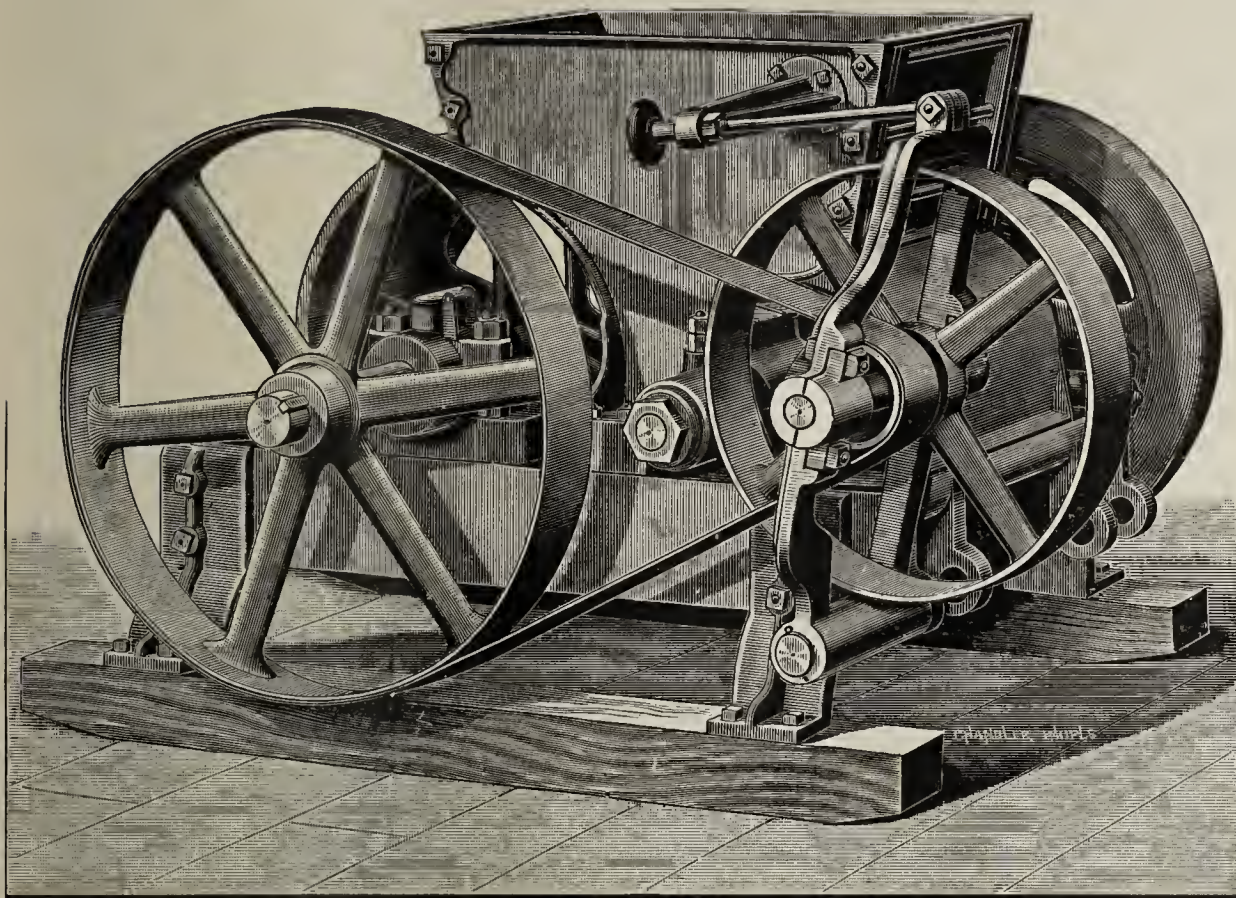
General Agent,

KEOKUK, IOWA.

Begin the New Year Right

BY PURCHASING

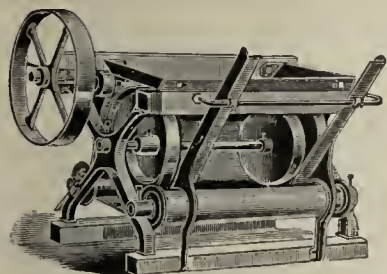
➤ A POTTS DISINTEGRATOR.



PATENTED.

Warning:—All machines now on the market using a roll having projecting bars working in combination with a rigid abutting surface, or feed rolls; are infringements of our patents. This is the decision given and sustained by the Supreme Court of the United States.

They work the clay direct from the bank; do not choke or clog with hard dry lumps, or wet, sticky lumps of clay. Separate the large stones and grind the small ones. They are Simple in Construction, Strong and Durable.



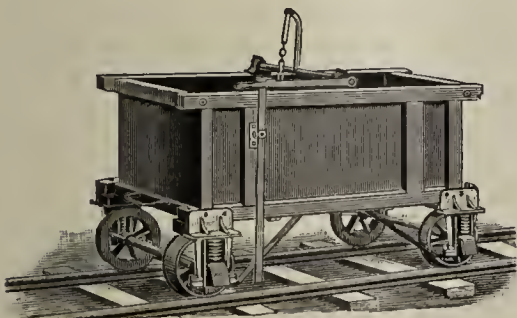
For the next few months you can purchase a

Potts Mould Sander \$100

for considerable less than

These Sanders are Simple in Construction, Strong and Durable, no place for the moulds to catch and cause delays. Moulds are better sanded than can be done by hand.

WE MANUFACTURE A COMPLETE LINE OF YARD SUPPLIES.



CLAY CARS.



BARROWS.



TRUCKS.



MOULDS, for Hand or Machines.

We cannot be beaten in quality of goods, nor prices. Send for catalogue.

C. & A. POTTS & CO.,

INDIANAPOLIS,
.... INDIANA.



COMPLETE SUCCESS!

That's the verdict of The National Brick and Terra Cotta Co., (see letter below). Moreover its the verdict, without exception, of **ALL** users of .

The Standard

Improved Brick and Tile Drier.



G. D. BOGART, President.

WM. MALCOLM, Sec'y and Treas.

The NATIONAL BRICK AND TERRA-COTTA CO.,

PASSAIC, N. J., November 14th, 1896.

THE STANDARD DRY KILN CO., Indianapolis, Ind.

DEAR SIR:—After running your Drier for some time would say it is a complete success and is drying our brick **free** from **checks** or **cracks**. We are making and drying 40 M soft mud brick every day that are acknowledged by all expert brickmakers as being the strongest and most perfect brick in this market. Your Mr. Wirsching has put up the Drier in a first-class and workman-like manner, and after regulating it to suit our clay, we had no trouble whatever, and would cheerfully recommend the "**Standard**" as being the best Drier in the market. You can refer to us at any time. Wishing you success, we remain,

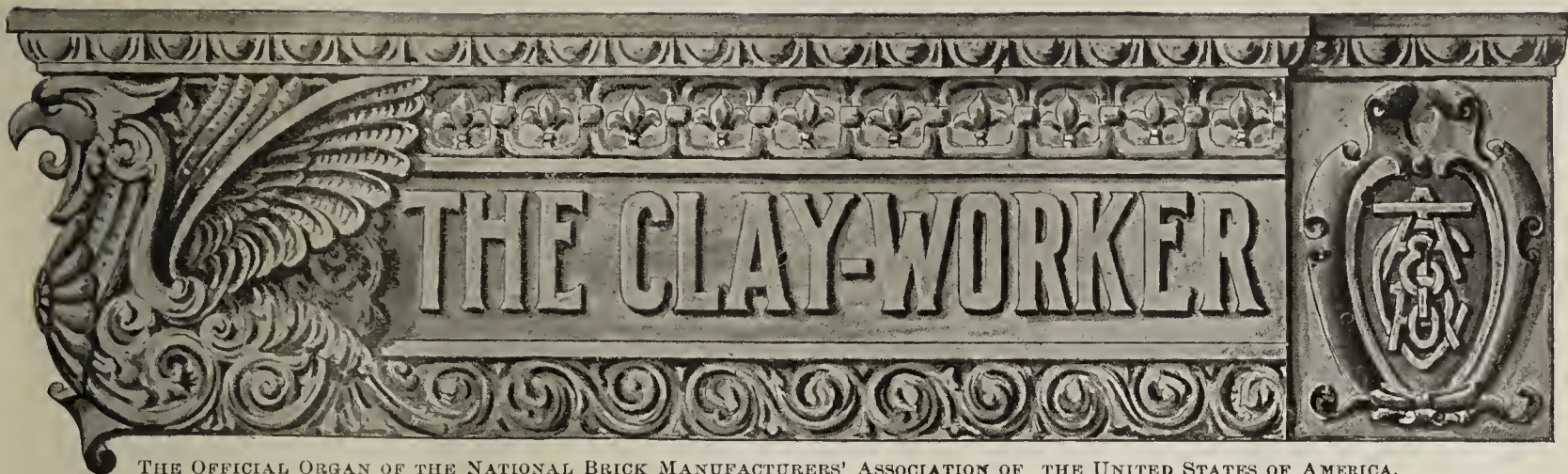
Yours very truly,

G. D. BOGART, President.

Its adaptability to different clays and the varied clay products has made **The Standard Drier** successful where others have failed. If you have this subject under consideration our Catalogue will surely interest you. May we send you a copy?

ESTIMATES CHEERFULLY FURNISHED.

The Standard Dry Kiln Co., 186 South Meridian St.,
INDIANAPOLIS, IND.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVII.

INDIANAPOLIS, IND., JANUARY, 1897.

No. 1.

Written for the CLAY-WORKER.

BUFFALO'S GREAT COMMERCIAL STRUCTURES.

Monuments in Brick and Terra Cotta as Enduring as the Hills.

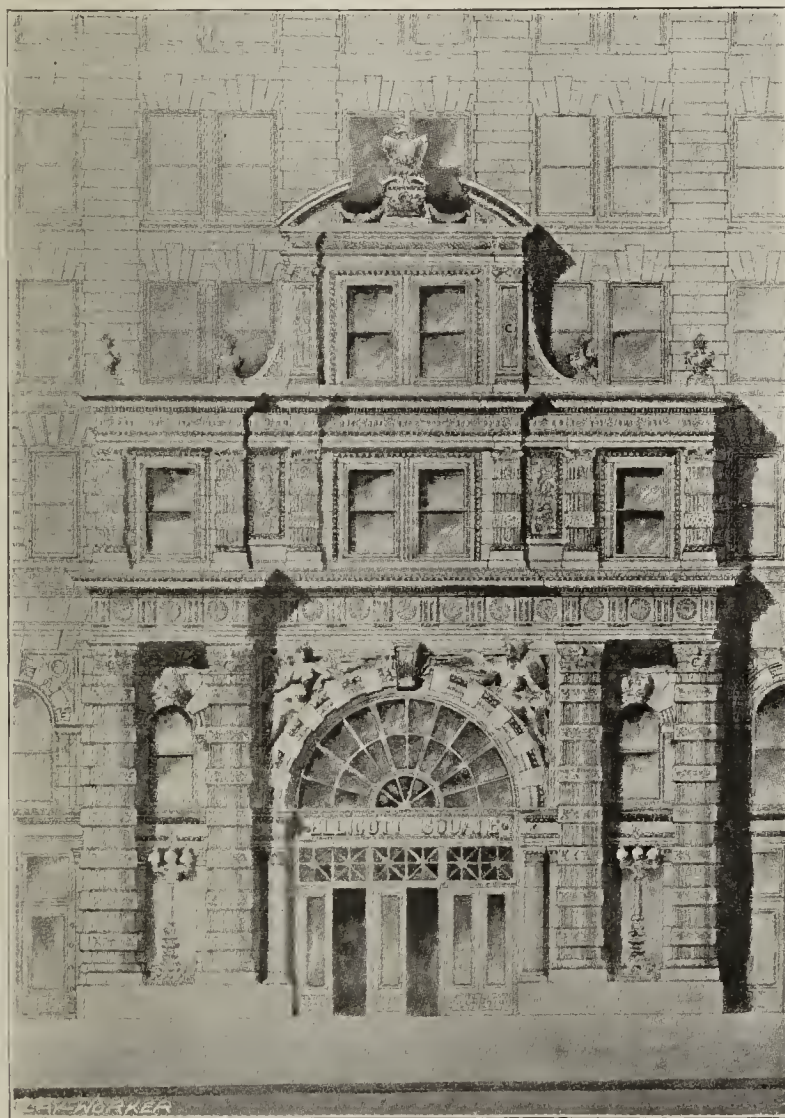
THOSE OF US who attend the N. B. M. A. Convention at Buffalo may see two great commercial structures, one the Guaranty Building, which we illustrated in the September Clay-Worker, the other the Ellicott Square Building, a cut of which is shown on the following page. The Guaranty Building is unquestionably the most beautiful commercial structure in the world. It is possessed of a simple majesty in outline and elegance of composition, a richness, refinement and profuseness of detail unknown to any other commercial structure. It is original, withal. We invite the attention of our clayworkers to the excellence of the terra cotta work in this building and the superior quality of the modeling of the decorative parts.

The Ellicott Square Building is one of the largest commercial structures in this country. The exterior of this building is also terra cotta and pressed brick—burned clay—the only material which can properly be used for the facing of the structural work of a fire-proof building. The brick and terra cotta for this building were furnished by the Perth Amboy Terra Cotta Company, and are a peculiar grayish white shade. This building was named in honor of Joseph Ellicott, the agent of the Holland Land Company, who laid out the village of New Amsterdam, now Buffalo, just one hundred years ago. Subsequently his heirs have retained title to what is

known as Ellicott Square, now occupied by the Ellicott Building. The structure is ten stories high, with a frontage of 240 feet and a depth of 200 feet. The foundation is of a character to sustain ten additional stories if they should be needed. The frame work of the structure is of steel, and the fire-proofing of the floors, partitions and roof of terra cotta, furnished by the Pittsburg Terra Cotta Lumber Company. The weight of the fire-proofing material in this structure is 12,000 tons.

A structure of this character is a community in itself of not less than four to five thousand men and women of many callings. It contains forty stores, six hundred offices, sixteen counting rooms, splendid club rooms and a great central court, which, when the building is fully occupied, may be visited by not less than fifty thousand persons daily. There is an advantage in being in a structure occupied and visited by so large a number of people, and this fact alone must tend to produce relatively large buildings in all of our cities, even those of moderate size. For those who have material or service to sell there is the greatest opportunity where there is the greatest number of people. With an office in such a building the lawyer may meet a new client; the one who would sell building material is conveniently at hand for those who would buy. The storekeeper exposes his wares where they may be seen by a large number of people. Thus there is the opportunity for the purchase and sale of material, labor and brain. A great structure like this is a time saver and provides unsurpassed facilities for the prompt dispatch of business.

Every branch of business may be transacted within its four walls. The telegraph, the mail chutes, the messenger service,



MAIN ENTRANCE ELLICOTT SQUARE BUILDING, Buffalo.

the facilities in every detail for the prompt, convenient and rapid discharge of business are all within arm's reach, as it were.

The richness of materials which are now used in a commercial structure, the conveniences provided, are wonderfully in contrast with those of a few years ago. Here we have in the grand court and the main corridors mosaic floors, marble wainscoting, decorative metal work. There are in the offices every possible convenience and arrangement for personal comfort.

The club room in such a structure means not a little. Business advantage, a spirit of co-operation and good-fellowship, a freshness and vigor, are brought about through contact with a large number of people. And because of the convenience of doing business under the best of conditions one is able to use a little time in this way. With a view of attracting lawyers to this building a great reference library, which is held free to all its tenants, is placed on its upper floor.

An authorized description of this building says: "The architecture of Ellicott Square may be termed Italian renaissance. * * * The general effect of this architectural treatment will be an ensemble which will reproduce the quiet dignity, repose and impressive grandeur of the great palaces of Rome and Florence.

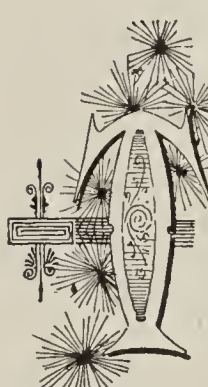
"The entrances are emphasized by pretentious architectural forms and sculptural decoration." L. H. GIBSON.

Written for the CLAY-WORKER.

CLAY GLAZES.—No. 1.

BY PROF. EDWARD ORTON, JR., E. M.

—The General Nature of Glazes.—



THE LITERATURE of all branches of the clay industries abounds in discussions on the subject of glazes. The instant attention which these efforts receive is a fair index of the fascination which it seems that clayworkers instinctively feel for that most beautiful but comparatively little understood portion of their art. Hitherto there has been much difficulty in getting thoroughly practical and skillful workers in glazes to tell what they know on the subject. Men holding important and lucrative positions in the Ceramic industries on account of their skill in glazing, naturally value the knowledge which their years of persistent and self-denying labor have brought them, and very generally feel that to make any part of their knowledge public would be to give away their stock in trade.

Hence, those best able to make genuine contributions to the public knowledge, as a rule, have been only willing to ridicule and condemn the statements of others without setting them right. But the bulk of the writings on the subject have come from practical men nevertheless. By practical I mean those who have learned what they know by empirical rules and constant practice in daily life, as opposed to those who learn from books and from scientific experiments.

But with men whose knowledge is wholly practical it is often, indeed, usually the case that they cannot understand each other's way of working, or thinking, or talking; and hence their discussions and debates generally fail to convince each other, or to educate the public to any material extent. It will be the intent in the following series of articles to treat of this subject from a somewhat different standpoint from that which has characterized most of those previous writings which have appeared in contemporary American literature. An effort will be made to weave out of the facts at hand a reasonable and consistent discussion of the fundamental principles, which science leads us to believe must surely exist, beneath the vast array

of disjointed facts and baffling contradictions which the practical writers have published.

—We Must Begin at the Beginning.—

In order to get anything like a systematic understanding of glazes and an idea of the way to proceed, in order to cure their faults and adapt them to our various needs, it is plain that our first care should be to learn what these substances really are, and just where they must be classified in the scale of inorganic nature. We must certainly thoroughly understand their chemical constitution before we can expect to alter this constitution to suit our ends. In order to present these first and fundamental facts in the clearest way possible it will be necessary for us to make an assumption at this point, which will not be proved to be true until later.

—A Glaze in Glass.—

I refer to the fact that glazes are a special subdivision of a still larger class of bodies, very familiar to mankind, and known as "glasses." That these two possess similar qualities is patent to all, but the distinctions between them are not so clearly visible. We shall proceed then, first, to try to get an understanding of the nature of the whole group, before attacking its subdivisions. What is a glass? Chemically we would say, "It is a silicate." But this explanation does not explain anything, for we must first know what a silicate is, and indeed, what silica is, before we can get any real idea from this term.

—What Silica Is.—

Silica is the most abundant compound existing in the earth's crust. It is not an element. It is a compound of two elements: oxygen, which is the same gas which supports our life with every breath, and silicon, a semi-metallic substance, not found anywhere in nature in its uncombined form. We can produce this semi-metallic material, free from oxygen and in its pure elemental state, by certain chemical processes; indeed, vast quantities are produced in iron blast furnaces, and it forms a percentage of the weight of every piece of pig iron which is sold.

But silicon, once produced, readily takes up oxygen again by chemical means, or by direct oxidation, and constantly tends to go back to its former condition, silica. In the manufacture of Bessemer steel the enormous temperatures generated are due to the combustion of oxidation of the silicon present in the pig iron. It literally burns like a fuel under the influence of a steady blast of air, and is almost wholly consumed before the carbon, also present in the pig iron, begins to catch fire appreciably. And when it oxidizes or burns, whichever you may call it, it only goes back to the very same form again in which it went into the blast furnace which produced the pig iron.

—Our Common Name For It.—

Silica, then, is the oxide of silicon, chemically speaking. In ordinary terms, it is the sand of the sea shores, or the quartz of the mountain ranges, or the flints of our inland hills, or the agate of the jeweler's shop. It is the hundreds of other forms which many will recognize by sight or by name. And we only begin to realize what a vast amount of silica there is in our world, when we know that no less than 60 per cent of the known crust of the earth is composed of it alone. Think of the vast ranges of mountains, the plains, the valleys, the ocean beds, as far up as we can go and as deep down as we can penetrate we find everywhere silica the predominating compound over all others put together.

And, when we see the fierce heat generated in a converter by the union of a few hundred pounds of silicon and oxygen, and think that every grain of sand on our seashores and every crystal of quartz in our mountains has given up its quota of heat, when its silicon and its oxygen first combined, our imagination shrinks back appalled at the immensity of the temperature which must have presided at the nativity of our planet.

—Acids and Bases.—

But all substances are not as simple in composition as sand.

In fact, it is a type of the simplest possible chemical combination, though many others equally simple are known to exist. But with most of these simpler compounds it is found that they are capable of acting almost like a simple element; that they can go on and form an almost endless variety of new combinations with other elements and other compounds like themselves. And in all of these complex substances there are two great classes of compounds—those which act as acids, and those which act as bases.

It is too much to undertake now to make it wholly clear what constitutes an acid, and what constitutes a base. But, in a word, they are positive and negative substances, which are always seeking more or less ardently for a union with a substance of the opposite sort. The product of such a union is called in chemistry a "salt." Our common salt furnishes a typical illustration of such a union. An acid, separated from a base, is an active and sometimes a dangerous thing; it is continually seeking something with which to combine, hence free acids do not long exist in nature, except those of the very weakest sort. Similarly, a strong base, if left exposed, will find an acid somewhere, if it has to draw it from the gases of the atmosphere.

In short, the acids and bases are like the sexes of the animal world, incapable of continuous separate existence, even though their unions are not always strictly harmonious or indissoluble.

—Silica an Acid.—

Now, silica is an acid. It is not what is called a strong one at ordinary temperatures. It does not seek combinations at the heat of a summer day, for instance. If it did we should not see such a world as that on which we now look out, for every

grain of sand would be combined, and the crust of the earth would be a solid rock.

Even when it is put with a chemical opposite, like caustic soda, one of the very strongest of bases, sand does not unite to form a new compound except in the slowest and most invisible ways, while one drop of nitric acid, when applied to the same soda instantly forms a new compound having qualities of its own, different from either those of the soda or the acid. But if the soda and the sand be mixed together, and heated to a point above redness for a while, a change begins to take place, and the final product melts to a clear and glass-like substance, while the nitric acid and soda, similarly treated are again broken up into acid and base, and are separated instead of combined by the heat.

We know from this and from other parallel facts that silica is a powerful and stable acid at high temperature, and a faint and feeble one at low temperature, and that its compounds are not likely to be easily divorced, when they have been married by so violent a means as fusion at white heat.

—The Compounds of Silica.—

At last we arrive at the point to which all this discourse has been tending. The compounds, which silica or sand or silicic acid, as it may be variably called, is capable of making with bases of any sort, are called silicates, and this name can now be easily understood to mean the marriage of two substances of which silica always acts as the acid. And, as silica is the commonest simple substance known, so the silicates are the commonest of all salts.

It is to this great division of inanimate nature that glasses



THE ELLICOTT SQUARE BUILDING, Buffalo. D. H. Burnham & Co. Architects.

belong. No good or permanent glass is made whose acid members are not wholly or partly composed of silica. As we will see later on, there may be several other components present, which act, in conjunction with silica, as acids, but they cannot be used alone to furnish the acid for a glass or glaze.

—Are all Silicates Glasses?—

The next point which naturally occurs is whether the converse of this proposition is true: If all glasses are silicates, in whole or in part, are all silicates glasses? Let us see. Most people have seen the slags or cinders flow forth from an iron blast furnace in a fiery torrent, and gradually cool into a porous gray stone. This is unquestionably silicate, for it contains the sand and the clay of the ores, the ashes of the coke, the limestone and all sorts of mineral debris which go into the furnace with the ores. On analysis we find that the slag is a silicate of lime and alumina, principally, containing from 30 to 40 per cent of silica. Is it a glass? No. It is stony in appearance, has a rough fracture and rounded edges, and, in short, does not resemble a glass in any respect.

But once in awhile a furnace will send out a flush of cinder which on cooling becomes smooth and glossy, and whose edges are sharp as a knife. A thin splinter of such a cinder may be translucent to the light, though deeply colored by the iron oxide with which it is stained. In fact, if a small ladleful of hot fluid cinder be dipped up from the runway and poured quickly

would take too much space at this time. But, in a word, we know that a stony silicate is composed of minute crystals or separations, floating in a matrix of clear uncrystallized matter. They are so thickly placed that they prevent the light from passing through and around them and hence the material is opaque; we also know that when the same silicate becomes glassy by sudden cooling from a fluid state that these crystals or segregations do not have time to form, and hence the entire mass remains homogenous and more or less transparent. Also, we know that we can produce this crystallizing process in any glass, simply by cooling it slowly enough, and that it thus loses its glassy character almost entirely.

Hence we can fairly say: "A glass is any amorphous (non crystalline) silicate, having smooth surfaces and sharp fractures."

—Not the Popular Idea.—

But such a definition is a long ways from satisfying our ordinary ideas on the subjects. We are accustomed to think of a glass as the smooth, transparent, generally colorless substance, which is used in such a multitude of ways for our comfort and health. But a moment's reflection will show one that after all color or the absence of it is not an essential attribute of glass, for we now get it in any tint of the artist's palette, from black to virgin white. Similarly, transparency cannot be counted as a requisite, for our glassworkers now produce opaque



W. H. BRUSH.



WM. C. BRUSH.



S. C. BRUSH.

BUFFALO'S OLDEST BRICKMAKER.

onto a cold slab of iron it will be a beautiful piece of black glass when it is cooled, no matter how stony the rest of the flush may be, which has cooled off slowly in the usual way.

Clay also is a silicate, as all of us well know. It is sometimes a pure silicate of alumina, but more generally a mixture of this silicate with free sand and many other minerals. When such a clay is buried to vitrification it forms a new and compound silicate of all the bases in the different minerals present in the clay. This vitrified clay silicate is, as you know, generally a stony mass of a texture varying from that of pumice stone to that of the hardest trap rock. But who of you have not seen a common arch brick, whose exposed end has become a black glassy mass by some sudden overheating and cooling? And who has not noticed that clay trial pieces drawn from the kiln while very hot show always a glossy and often a glassy fracture when broken?

—A Physical Difference.—

What is the deduction from these and many similar facts which your own memory will supply? A glass is obviously a silicate, but a silicate is not always a glass. And, since the same silicate may be made into a glassy or a stony mass by varying its treatment, it follows that the difference is not a chemical one, but is connected with the physical structure after all.

To thoroughly explain the mystery of this transformation

glasses, which are not to be distinguished readily from the precious stones which they imitate, such as the jade, opal, carnelian, malachite and chrysoprase.

And, though our definition is a wide one, and seems at first sight to take in many things widely different from our ideas of typical glasses, still we can readily see that it is impossible to draw a line between them, on account of any chemical or physical differences.

It is not necessary at this time to go into any extended statement of the origin of artificial glasses, but a few words on this point may make our previous position more clear. To begin with, do we find any natural glass in the world? Yes, a little. And where would be the place to look for it, judging from what has been said about its origin? Wherever we could expect to find fluid silicates which have been quickly cooled off. And, as a matter of fact, wherever we can find recent flows of lava from volcanoes we will find along the edges and extremities of the outflow a black volcanic rock called obsidian, which is as perfect a glass as much that is used for the manufacture of bottles and other inferior wares.

And, following up the same lava flow towards its source, where we find larger masses which have been much longer in cooling, we find the obsidian gradually changing into the crystalline and commoner varieties of igneous rock.

—The First Artificial Glass.—

Primeval man discovered glass by the accidental overburn-

ing of his claywares, and in trying to reproduce it he learned to select an impure and limy clay for this purpose. Later, he learned to add still more lime to his clays to make them melt more completely. There is little doubt that from some such crude event has come our beautiful art of glassmaking.

It is probable that man knew a great deal about the manufacture and use of glass before the application of it to the purposes of a glaze for pottery was thought of. The glazing of the older forms of pottery is very imperfect or lacking altogether, and it is only after many centuries of history had been made that glazes, in the sense with which we speak of them, began to find use.

But before going further, we must agree on what a glaze is. We found that no definition for a glass can be framed, which includes the glasses of commerce, and excludes a great number of other substances which are more or less unlike the manufactured sort, and that the title glass, really is a generic one which covers a great group of chemical compounds, without distinction as to their use or usefulness.

—What is a Glaze?—

Similar difficulty is met in limiting the definition of a glaze to the well known forms in common use. In fact, there can be but two points made as the limiting conditions of a glaze: First, that it shall be a glassy silicate, and second, that it is not complete in itself, as glass is, but that it must be fused fast to the

surface, whether of to-day or centuries past, show their first attempts at decoration and ornamentation by the application of slips or pastes made of some clay dissimilar in color to that of which the ware is made. The use of these colors finally resulted in the discovery of a clay which fused to a black glass on burning, and this, spreading over the ware, greatly enhanced its beauty and desirability. And, old as is the potter's art, we still employ these natural "slip" clays as glazes for vast quantities of our coarser and cheaper wares, and all our skill has failed to supply a cheaper substitute which is in any way better or more beautiful.

The ease with which comparative perfection of dark-colored glazes may be obtained from such simple materials as a natural "slip" clay has caused many a man to wonder why any departure from this simple type towards the more beautiful clear glazes should lead to such immensely different results and such a series of profitless failures. The inwardness of this well-known fact will become apparent as the subject progresses. Just now, suffice it to say, that we have little understood or reckoned on the great physical differences which exist between a clear glass used as such, and a clear glass used as a pottery glaze.

—Distinction Between Glass and Glaze.—

In the former case the glass is melted in a pot; its gases are given time to escape, while the heat is maintained to the



OLIVER A. JENKINS, President.



GEORGE CARTER, Vice-President.



O. J. SWEGLES, Secretary.

EXECUTIVE FORCE OF THE LANCASTER
BRICK CO.

surface of some other substance, on which it depends for support and preservation. From this, it follows that a glaze is always a glass, but glasses are glazes only when used as such.

Do we mean to say by this that there is no difference, chemically, between a typical window glass, for example, and a typical whiteware glaze? Not at all. We mean only, that no line can be drawn between glasses and glazes, except that of the use of which they are put, but that the typical glass and the typical glaze are quite sharply distinct, chemically, because the physical requirements put on them are so widely different; yet isolated examples could be collected which would make a complete connecting chain between the compositions of the two types. In other words, the chemical distinctions between glasses and glazes are not structural; both have the same general kind of formula, but the substances which are chosen to make up the ingredients of the glass, are partly and often largely replaced by other ingredients in making up a glaze.

—The Earlier Glazes.—

It is probable that the original uses of glazes began with just such an accidental discovery as that by which glass was obtained from an over-burned clay. All crude pottery from savage

highest point and the fluid is in its most liquid stage. When all chemical action is past and the liquid lies like a clear lake in the bottom of the pot, it is cooled slowly down till its consistency is that of taffy, and while in this condition it is taken out and blown and molded into the forms which we desire. When finished, each article is composed of a homogeneous material. It is material which has been fluid, like water, and, therefore, must be the same in all of its parts. This material has its own rate of expansion and contraction, as it is heated up by the air or by its hot liquid contents, or is cooled down by sudden immersion in water. One portion is as free to move molecularly as another, and the molecules of one part are moving at the same rate as those of another. Therefore, no internal strains or stresses are produced which would tend to break it, except occasionally those which are the fault of bad workmanship or haste in the manufacture. As a rule, glass is a strong, stable material, which only breaks by exposure to a sudden blow, or very rapid change of temperature or other unfair treatment.

But consider the case of a clear glaze, which is applied to a piece of pottery. To begin with, the ware is the principal thing and the glaze is secondary. The heat treatment of the

glaze must be always arranged with reference to that which the ware itself can endure without detriment. That is to say, the glaze must be so compounded that it will fuse fast to the ware and attain its perfection at a temperature lower than that required to affect the stability of form of the clayware.

Not only that, but its full perfection can only rarely be obtained, because it is not possible to bring it to perfect and long continued fusion such as a glass received in its clearing stage, because it would either run off or soak into the ware. Hence its burning must be stopped when it has attained a certain stage of perfection; if it is stopped a little too soon the glaze is full of bubbles of gas, which could not escape from the sticky, semi-pasty mass. If it is carried too far gases again escape and bring a second eruption of bubbles, which would not have been disengaged at all at a little lower heat, and which cannot be entirely driven out of the glaze without going to extremes of heat, entirely beyond the range permitted by the body of the ware. So a glaze never gets the thorough knitting of its parts which a glass enjoys, but has to content itself with such combination as is permitted without too great fluidity.

Not only must the glaze be held subservient to the ware as to burning temperature, but it must be made to expand and contract at the same rate, as nearly as possible. For if two dissimilar substances are fused fast to each other, and then allowed to cool the stronger of the two will be very liable to break the weaker in its efforts to contract at its own normal rate. If the body is a quarter of an inch thick and the glaze is one one-hundredth of an inch thick, it is plain that the advantage will rest with the heavier mass, other things being equal. And, as it is always the ware which we want to preserve, it is always the glaze which must be made to suit its contraction or expansion.

Enough has been said, it is hoped, to show something of the relations existing between the glasses and glazes, and between both of them and the stony silicates. The next paper will take up the chemical composition of glazes in detail, and discuss the various substances which can be used in them in their commercial manufacture.

Written for the CLAY-WORKER.

IN DEUTSCHLAND. No. 11.



CONTINUING OUR NORTHWARD JOURNEY, we made Frankfurt our headquarters for two days. By the way, the city boasts of the finest railway station in Germany. The patriotic festivals which we had witnessed already more southward seemed to have their continuation here,

and it was our privilege to see a grand illumination on the evening of our arrival, throwing the city into a blaze of light. The streets were crowded with people, enjoying the celebration to their hearts' content. We might state here that a better behaved and a more good-natured crowd could not be met anywhere, and even in the poorer quarters no vulgar scenes were witnessed. Politeness seems to be universal among Germans, and we had occasion to test this many times. An inquiry, whatever it may be, is always replied to pleasantly, and more than once people went out of their way in order to direct us to our destination in the clearest manner possible. However, we did not meet with much success in investigating clay works around Frankfurt. On calling at the most prominent brick works, situated some twenty miles from the city, admission was not granted us by the Superintendent. This, by the way, was the only instance where we were not admitted to a brick plant.

The next stop laid out on our route was Giessen, a town famous for its university, where Liebig, the celebrated chemist, taught for a number of years. But the attraction for us was a brick factory, the Gail Brick Works, about which we had heard quite a good deal, and which represents the most modern stage of the German brick industry. A large variety of goods is manufactured by this concern, all kinds of front

brick, fire brick and roofing tiles, glazed and unglazed. The Superintendent, Mr. Wagenschien, received us with a hearty welcome and escorted us through the various departments, keeping up, on the way, a highly interesting talk concerning his methods of producing the different kinds of ware. Of special interest was his experience with conveyors as used in the brick industry for the transportation of clay and coal. The factory offers an imposing appearance, being a brick building, with a tower at the middle containing a clock. On the tile roof the name of the concern appears in large letters, composed of dark and lighter colored roofing tiles. The clay bank is situated about three hundred feet from the factory, and is about fifty feet deep. Different kinds of clay are obtained from it, the two main strata being a fire clay and a buff-burning material. Both are exceedingly hard and difficult to mine. A novel arrangement is in use here for transporting the clay to the factory, being a cable conveyor, consisting of buckets suspended from iron rollers which run on a cable as on a track. The steel rollers are double flanged and connected by a strong frame. A wire rope in continuous motion, to and from which the buckets are alternately attached and released, propels them up the steep incline. The manner of attaching the buckets to this rope is contrived in a very simple way by means of two discs, which, on pulling a lever, are brought together, thus taking a firm grip on the rope. The empty buckets coming into the clay bank are released from the pulling rope automatically, and are then shoved on to a switch, where they are loaded.

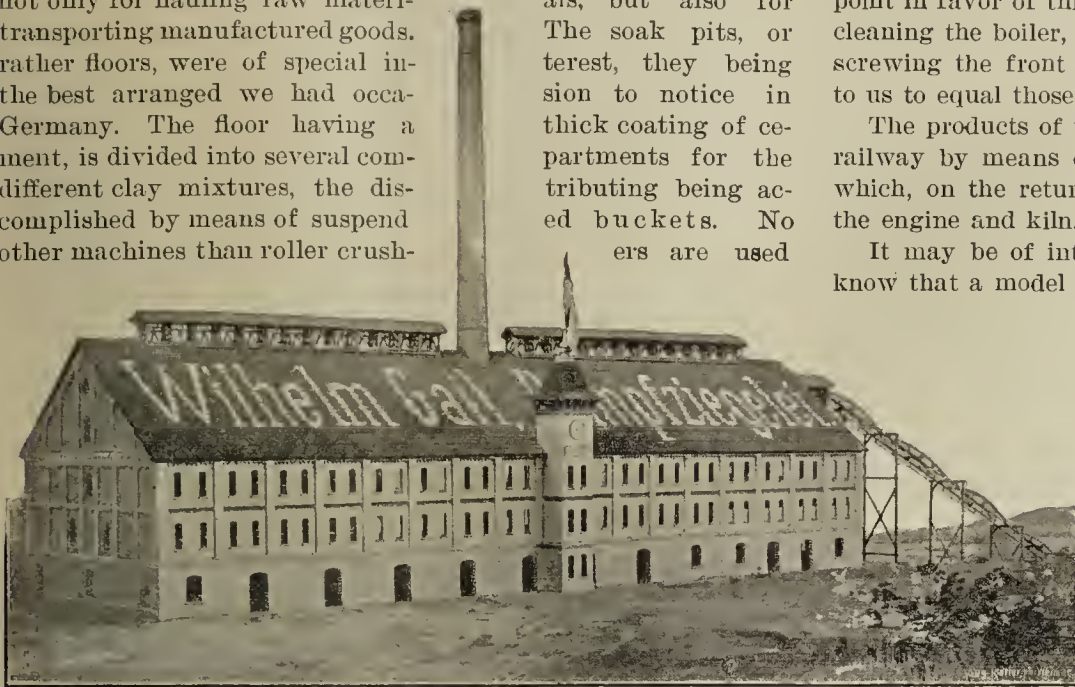


END VIEW OF THE GAIL BRICKWORKS. Factory B.

When ready for the ascent they are returned to the main track, attached to the power cable and commence their upward journey to the soak pits. It is one of the advantages of this system that any number of buckets may be kept in motion, limited only by the strength of the cables and the ability to handle the loads at the two ends. At the soak pits the buckets are released automatically and pushed on to a suspended rail track forming a loop around the room. The empties are, of course, again transferred to the main track and descend to the bank. Thus an endless line of cable connects the factory with the bank, one side for the ascending, the other one for the descending buckets.

Such cable conveyors are used quite extensively in Germany and seem to give satisfaction wherever operated. In their construction the main stress must be laid upon the erection of proper supports at suitable distances, usually from one hundred to two hundred feet; however, in hilly regions the distance may be as much as 1,500 feet. Our cut represents an iron support for normal topographical conditions and ordinary loads. It will be observed that it consists of two legs bolted down to a solid foundation. However, wood constructions are most frequently used. It seems, at first sight, as if such cable conveyors would cause constant trouble, considering the fact that the rollers run on a swaying cable, but according to the testimony of a number of owners this is not the case. In fact, we were told that they are less troublesome than the ordinary tracks on

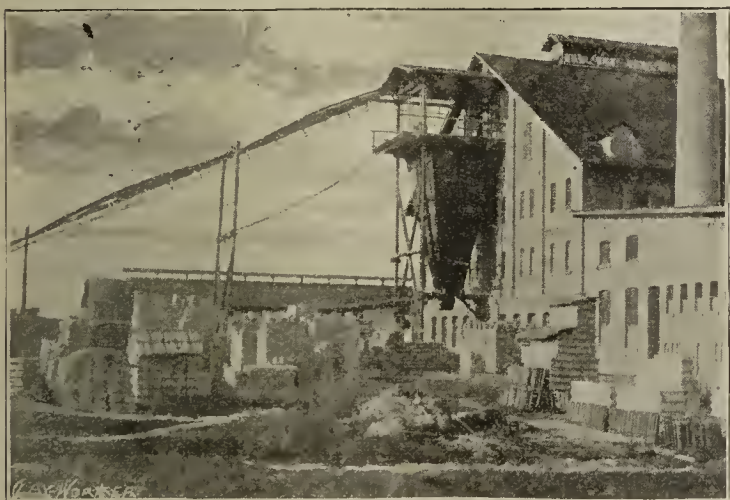
terra firma. At any rate, the writer believes that this system might be advantageously operated on some of our clay works, not only for hauling raw materials, but also for transporting manufactured goods. The soak pits, or rather floors, were of special interest, they being the best arranged we had occasion to notice in Germany. The floor having a thick coating of cement, is divided into several compartments for the different clay mixtures, the discharging being accomplished by means of suspended buckets. No other machines than roller crushers are used



THE GAIL BRICKWORKS, GIESSEN. Factory A.

for grinding the clay, which then passes through a pug mill before entering the auger machines. The drying is accomplished, as usual on top of the continuous kiln. Platform elevators are used for conveying the dried ware to the kiln level. Some of the roofing tiles are glazed, others colored with clay slips, the glazed ware being set in the kiln without any special precautions. The kiln is of the up-draft style, with return watersmoking, and gives perfect satisfaction, this being evidenced by the high quality of ware turned out. In fact, we may say that this type represents the most advanced specimen of a continuous kiln with direct firing. The coal is elevated to the top of the kiln by a bucket elevator, which empties it into suspended buckets. By means of these the fuel is distributed. All the waste from the kiln is ground up into grog in a ball mill which has a capacity of grinding 30,000 pounds of grog per day. For the manufacture of fire brick the calcined clay is also disintegrated by means of this machine.

It was something of a surprise to us to find that the power for driving the machinery in this concern was furnished by a semi-portable engine of the compound type, and we were told



GAIL BRICK WORKS, Cable Elevators.

that this engine was put in after due deliberation and comparing it with the usual stationary engine. Thus, it was considered that such an engine occupies less space, does not need a foundation and connecting steam pipes, and comes from the shop ready for immediate use. In addition to this, the semi-portable engine consumes less steam, owing to the fact that

no steam pipes occasion any loss by radiation, the cylinder being constructed within the steam dome of the boiler. Another point in favor of this type of engine is the convenient method of cleaning the boiler, out of which the flues can be drawn by unscrewing the front head. But these advantages did not seem to us to equal those offered by a separate engine and boiler.

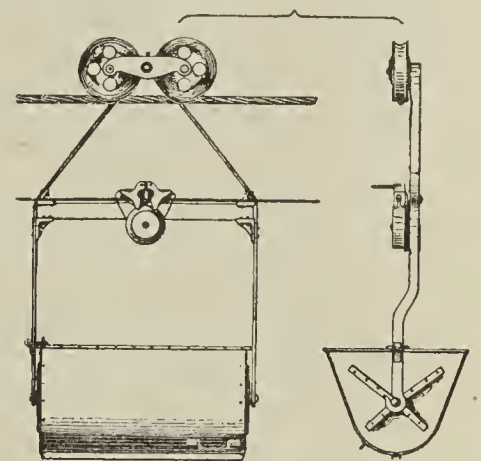
The products of the Gail Brick Works are transported to the railway by means of the suspended buckets mentioned above, which, on the return from the place of loading, bring coal for the engine and kiln.

It may be of interest to the readers of the Clay-Worker to know that a model of this brick plant was exhibited at the Columbian Exposition by the builder, Mr. Otto Bock.

Besides this factory, Mr. Gail owns another brick works, situated a short distance from the one described, where front brick are made exclusively. Factory B has three auger machines and a continuous kiln of sixteen chambers, each holding 10,000 brick. With the works are connected large stock sheds, holding the various kinds and shades of brick. The offices and draughting rooms are located in an elegant brick building adjoining factory A

—Brick Conveyors.—

Some novel methods of handling brick to and from the drying rooms are to be met in German brick plants. In the following we will attempt a short description of two of these conveying systems: In one, as shown by the cut, the brick are put on cars suspended from an overhead track, like the clay buckets discussed previously. In the cut the car is shown in position at the brick elevator, where it is loaded. The cars are provided with three wheels at the bottom so that they can be wheeled on the floor after being unhooked from the overhead track. Special switches are provided for turning the top rollers from the track and letting the car touch the floor. In this manner such a suspended car is loaded at the elevator, taken to the racks and derailed at the right place, so that it can be wheeled between the racks to be unloaded. In order to enable the men to take the car off the track at any place, movable switches are constructed, corresponding to the transfer cars of our driers. These switches are simply movable lengths of rails with somewhat pointed ends, which rest upon the main track. Thus the brick cars run on to this siding and are derailed. Similar to the cars, the derailleurs are suspended from overhead rollers and are moved along in this manner. This conveyor, which must be acknowledged to have at least the advantage of smooth motion, has been designed by Mr. O. Bock.



CLAY BUCKET RUNNING ON CABLE.

The other system to be considered is that invented by E. Hotop, depending on a principle somewhat similar to that of the preceding one. Hotop, instead of using cars, uses numerous brackets, suspended from rollers which run on an overhead rail and are connected by a chain. By means of this chain the brackets are moved along by power. Our cut shows the mechanism, consisting simply of a sprocket wheel, by means of which the chain conveyor is set in motion, and which also enables it to turn around corners. Such a conveyor may have almost any length, and there are some in use 2,400 feet in length. By arranging the brackets at short intervals a large number of brick can be transported per day, and a daily capacity of 80,000 brick is common.

Written for the CLAY-WORKER.

SMALL PLANTS HERE TO STAY — COME TO BUFFALO.

BY R. B. MORRISON.



ONE MONTHS AGO a writer in the Clay-Worker used the following language in reference to low prices of brick and the fact that the supply was greater than the demand:

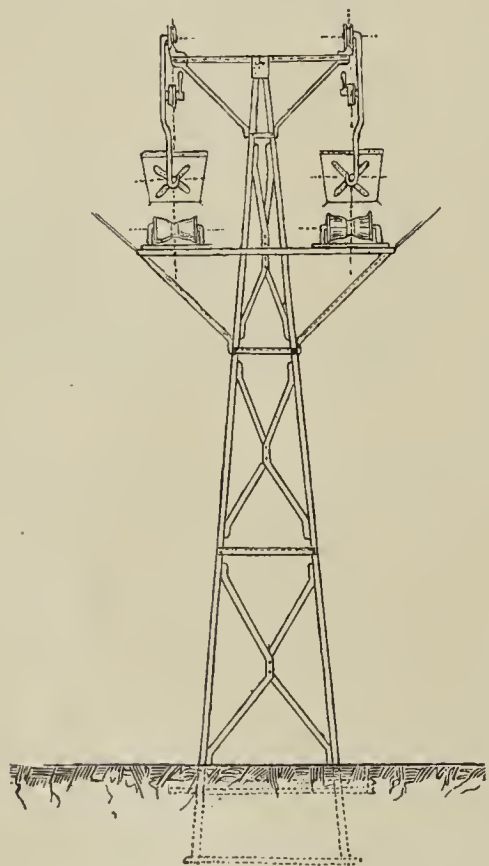
"This business is getting into the hands of large concerns, and it is only a question of time when the men of small means must step down and out, or lose the little they have."

The writer no doubt expressed the prevailing sentiment among brick-makers. Let us consider this statement for a little while and see whether it is really true or not. It may be true of large cities. Where there is enormous consumption within a limited territory conditions are favorable for this state of affairs, and the large concerns can make bricks cheaper than they can be made in a small way, and the small manufacturer may be crowded to the wall.

But in the smaller cities conditions are quite different. Should a large brick plant be established in a city where local market was limited, they must then depend upon orders from other cities, at a greater or less distance, and the expense of transportation becomes a factor. In a section where clay and fuel are well distributed the cost of freight will be greater than the advantages a large plant may have over a smaller one in the cost of production. For this reason alone the small manufacturer will be able to cope with his stronger competitor in certain localities. And as the smaller cities outnumber the larger at least fifty to one, it is plain that we must always have in this country a very large majority of smaller manufacturers

of brick. In other lines of manufacturing where the product is much more valuable in proportion to its weight there is danger of large firms monopolizing the business.

This, however, is not the only factor in favor of the small plant. The brick plant, like any other manufacturing plant, is valued by its dividend-earning qualities. If a plant with a capital of \$10,000 earns \$1,000 per annum and another of \$100,000 capital earns \$8,000, the small plant has earned a dividend of 10 per cent., while the larger has earned only 8 per cent. The fixed expenses of the large plant are many times greater than those of



IN DEUTSCHLAND—CONSTRUCTION OF TRESTLE FOR BUCKET CONVEYOR

the smaller one. If both are idle three months in the year, during that time the smaller plant is earning just as much as the larger, and yet the expense of the larger plant is perhaps \$5 to \$1 of the smaller. For this reason during hard times the strain is much greater on the larger establishments, and, in

proportion to their numbers, I believe there are more failures among the large plants than among the smaller ones.

Another advantage in favor of the latter: They are usually owned and managed by a practical brickmaker, while stock companies are necessarily composed of capitalists who have been educated in other lines of business. This fact has in many instances crippled large concerns engaged in brick manufacture.

These alleged arguments are offered for the encouragement of those who are in the business on a small scale. In my opinion the time will never come in this country when brickmaking will be monopolized by large concerns. We will always have the well-to-do small brickmaker, and I am glad this is the case. It has been demonstrated beyond a doubt that it requires a high order of business ability on the part of the managers to make a financial success of a large brickmaking enterprise. This goes to prove that it is a rather difficult undertaking.

If the small manufacturer will keep up with the procession



IN DEUTSCHLAND—A NOVEL BRICK CAR.

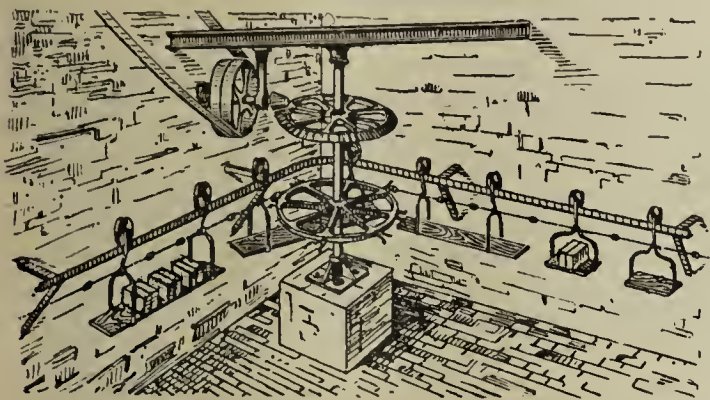
in improvements, keep well posted in all that pertains to his business, he is in no danger of being crowded out. He can only do this by reading the clay journals and standard books written for clayworkers, and by keeping in touch with clayworkers, as far as possible, in all parts of the country. There is nothing like personal acquaintance and association, and this is only possible by local and national associations. Every brickmaker should be a member of one or both of these organizations. The advantages these afford a brickmaker cannot be enumerated.

Who can estimate the lasting benefits that have accrued to the brickmaking world from the labors and through the influence of our National Brick Manufacturers' Association? It has made the literature we have to-day. Many of the late improvements in brickmaking appliances are the direct result of the experiences of practical men, garnered and sifted, classified and harmonized, crystallized and systematized. Here science and practice meet and join forces, to make plain that which was dim and uncertain, to make crooked paths straight and light to shine where darkness has prevailed.

While it is true that all brickmakers are more or less benefited by the work of our National Association, yet those who fail to attend our annual gatherings miss many good things that cannot be otherwise obtained. Members of our National

Association have friends in all parts of our country to whom they can go for information and advice at all times; they are friends upon whom they can depend. It is simply a great bureau of information, upon which we may draw at will.

The next Annual Convention will be held during the first



IN DEUTSCHLAND—HOTOP'S BRICK CONVEYOR.

week in February, at Buffalo, N. Y., a place centrally located, easily accessible, a large and beautiful city. Here may be seen the greatest electric power plant in the world, whose source of power is the mighty Niagara, one of the natural wonders of the world. To those who have never seen the Falls this feature alone will be worth the entire expense of the trip. It is especially interesting in the winter season. Then, judging from the programme in the December number of the Clay-Worker, we will have a most interesting and instructive Convention. The brickmakers of Buffalo, with our esteemed and beloved Brother Brush in the lead, will assure us a warm and hearty welcome. I feel confident we will have a large attendance from every section of our country, as well as from Canada and Europe. Come, and urge your brickmaking friends to join you.

Written for the CLAY-WORKER.

FOUNDATIONS AND FLOORS OF KILNS.



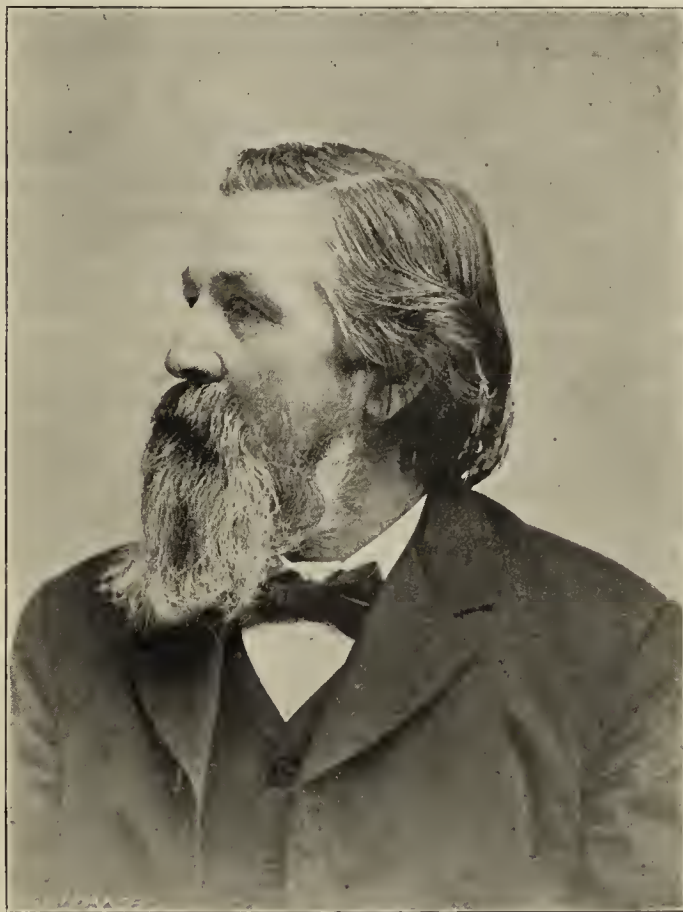
THE LOCATION OF KILNS is of the utmost importance. If possible, the kilns should be located first and the plant built conveniently around them. The worst location is on low ground; the next worse on a side hill or between a hill and its natural drainage outlet. In either case the

foundations must be laid on a thick bed of concrete, but even with the best preventive care there will be great loss of heat in the foundations, and much steam rising through them into the kilns, however they may be constructed, unless the ground is thoroughly drained at a lower level than the bottom of the foundations. In making the concrete only the best hydraulic cement should be used, with either hard, broken brickbats, quartz gravel or some hard, close-grained stone. Limestones, unless crystallized, and sandstones are too porous.

As the kilns are the foundations of successful output, so the foundations of the kilns are the groundwork of successful burns. There is no place about a brickmaking plant where the best work is so imperative. After construction the foundations will be out of sight. If they are faulty, many misleading reasons for poor results are likely to be accepted. Economy of fuel requires dry foundations. Roof drainage should be carefully kept away from them. This is most likely to be overlooked. Engine condensation should be conducted to a lower level than the foundations. This is also easily neglected.

It is a scientific fact that in solid bodies, protected from currents of air or gases, heat conduction goes equally down or up. A vertical copper rod, covered from the air, except its middle and ends, and heated at the middle, will melt wax on the top and bottom ends at the same time. We would not expect good results with an arch constantly soaked in water, however thick

the arch might be. It is worse to have a wet foundation, because all the water evaporated is sucked into the kiln or flues. Discoloration of bricks, loss of fuel, loss of draft, uneven heats and many other troubles result, such as weakened foundations, cracked walls, and uneven floors and distorted flues. With damp foundations in a down-draft kiln it is almost impossible to get the lower courses of bricks well burned. In an up-draft kiln even more heat is lost in the foundations because the high heat is at the bottom. At one of the stations of the Chicago Gas Light Company, about 1880, there were twenty-four retort ovens, built together on one foundation, the bottom of which was below the drainage level. Although there was a very thick bed of concrete on the bottom, the lower retorts in the ovens could never be got to a high heat. A tube well driven down twelve feet, just outside the foundations, was pumped and gave a continuing stream as long as the pumping was kept up. The foundations of that whole structure were in hot water. A new stock of ovens was afterwards built there above the ground, and the heats were all that could be wished. This is but one of many practical proofs that can be cited of the downward loss of heat in wet foundations. It is best to have foundations laid broad, so that the walls can be made much wider at the bottom and gradually sloped upwards on the outside, for this construction helps very much to keep the walls in place. Buttressed walls are very objectionable where they can be avoided. The most uniform construction is the best for economy and durability, so that expansion and contraction may be even. The greater evenness of expansion and contraction in round kilns is the chief reason of their greater durability, but square kilns seem to be more easily set with varied materials



LOUIS KIRKOVER, Buffalo.

and more easily regulated in burning. Buttresses are all right for buildings, but where there is constant movement of expansion and contraction anything that makes that movement differential should be avoided as much as possible. It is important that the foundations should be broad enough and deep enough for the weight they are to carry, and that they should be started on solid ground, because they expand also every time a kiln is fired, and if they yield, ever so little, the kiln in time gets out of plumb and becomes useless. There are such

kilns to be seen to-day. Bats should not be used in foundations, but whole bricks, specially bonded. Sometimes this may save a kiln where a part of the foundation may be undermined by drainage or otherwise. Hydraulic cement should be used in the mortar, about one-third cement to two-thirds lime, with the usual proportion of sand. All hydraulic cement is kiln-burned and will stand as much heat as common bricks, and generally more.

In up-draft kilns the floors should have two courses of hard-burned fire bricks. In down-draft kilns the lower flues should be deep enough to hold what light ashes may accumulate in a number of burns, for these flues are likely to be overlooked and



ROME BRICK CO'S ROUND KILN, ALTERED BY W. A. EUDALY.

not cleaned out till a poor burn calls attention to them. They should be wide enough for a man to crawl through, so that they may be inspected, for their side walls often get uneven and sometimes bulge out enough to make poor draft. However, they should not be too wide, or the gases will lose direction, as water does in the pools of a stream. They should be rounded at corners, keeping in mind the fact that the gases are in motion towards an outlet and that they are making their own forward movement in the stack, and also by connection in the flues, and their movements should be as uniform as they can be. The flues should be lined with smooth, hard-burned fire bricks and the joints struck very even, to save friction and accumulation of soot and ashes. Delicate forces require delicate treatment. The openings into the lower flues should be few as possible, those furthest from the outlet somewhat larger than those near it.

Kilns are built to confine heat, and bottoms too open lose very much heat by downward radiation. Where soft coal is used combustion of the gases continues throughout a kiln after the bricks get incandescent, and the longer those gases are kept in the kiln the more heat they yield. No uniform rule can be laid down for kiln bottoms or bottom flues. The location and construction of the furnaces and stacks are so varied that each kiln must have its special system of outlets. In setting kilns the flues leading to the outlets can be made in the bottom courses to great advantage. The outlets should be as far from the fire holes as they can be. In the middle of the kiln, where the furnaces are on both sides, or both ends; but in those fired from one side they should be located near the opposite wall.

Solid, dry foundations have the advantage of retaining a great deal of heat, and of preventing, during the first fires, any condensation on the bottoms or in the bottom flues.

In localities where a very sooty coal is used bottom flues are required to be larger than where semi-bituminous coals, like the Cumberland or Indiana block, are available.

In conclusion, all of the conditions of a locality as to coals, clays and climate may be studied to great advantage in the construction of kilns for burning bricks and clay wares.

GEO. C. HICKS.

Written for the CLAY-WORKER.

A ROAMER AMONG THE ROMANS.

Pres. R. B. Morrison's New Works—His Political Preference.

A FEW WEEKS AGO I had the pleasure of visiting Rome, Ga., the home of the President of the National Brick Manufacturers' Association, the Hon. R. B. Morrison. Say, did you know that Mr. Morrison was elected Mayor of North Rome last November? Well, he was, and not only this, it is the first time the town was ever known to go Republican.

It is thought by some that while Mr. Morrison may be politically all right from a Republican standpoint, that doubtless he is a little shaky on home rule. It is also fair to presume that Mr. Morrison must have made some strong pledges in the right direction in order to have secured so many good stanch Democratic votes. I think he should rise up and explain at the Buffalo "pow-wow."

Since Mr. Morrison's election he has time for a great many things which formerly were out of the question. So with true Georgian gallantry he took a back seat in the carriage which drew up in front of the Rome Brick Company's office to drive a small party of us to visit the company's works.

We found the works situated about one and a half miles from town on the banks of the Etowah River. This is one of the most picturesque spots I have ever seen, with hills and mountains on every hand covered here and there with forests of pines and oaks. In many of these hills are vast deposits of shale clay, while spread out along the river and valleys adjoining are acres and acres of the finest quality of plastic clays.

Now that we have alighted from the carriage, we will take a walk about and through the works, which cover several acres of ground. We soon found ourselves standing on one of two large drying floors. I did not ascertain the size of these floors, but they were very large. Through the center, or rather between these floors, extended two rows of immense coal furnaces, and at the opposite end of either drying floor stood two large smokestacks. The furnaces were connected to the stacks by



ROME BRICK CO'S PLANT.

the ordinary method of a network of small flues beneath the floor connected to cross flues, which in turn were joined to the smokestacks.

Under the same roof we found two large Chambers's machines, crushers, elevators, pug mills, etc., etc. These machines stood one to either side of the large Corliss engine and battery of steam boilers, which furnished the power for pulling the clay, in clay cars, up an inclined plane into a convenient place in the building, as well as for running the machinery. We also found in the same building a large dry press-brick machine, with pulverizers, screens, etc., etc.

At the opposite side of the dryer are a number of the Morrison updraft kilns. These kilns were built by Mr. Morrison a number of years ago, and still continue to do excellent work. Next to the Morrison kilns, on the same line, are four of the old-style, round down-draft kilns, or I should say three, one of the four having only recently been converted into a Eudaly



H. H. McCLURE, W. A. HANCOCK, MRS. W. A. EUDALY, J. L. CAMP AND R. B. MORRISON.

down-draft kiln. They were drawing vitrified street paving brick from the Eudaly kiln the day we were there, and to all appearances, they were far above the average street paver of the country. They had taken the extreme heat well, standing straight and perfectly vitrified from top to bottom. The Board of Directors say they will alter the three remaining round kilns and build a plant of Eudaly square kilns at once for burning street pavers and dry pressed brick of all kinds, including iron spots and the various shades of buffs.

The Rome Brick Company's works are among the largest in the South. They have, in former years, regularly shipped large quantities of their output into several of the surrounding States, and doubtless will continue to do so in the future as in the past.

Now that the company has settled that a No. 1 street paver can be made and burned from their clay they will increase and improve the plant, so as to meet the rapidly growing demand for street pavers all through the South. Mr. J. L. Camp, President of the company, expects to spend much of his time at the works this season. We learned in conversation with Mr. Camp that he supposed his company to be the pioneer paving plant in all that section of the country. One only has to see his energy and the advantages of his plant to believe the truth of his assertion. Why not? He certainly can make the brick, and if Mr. McClure cannot sell them and collect the money no one can. Make, sell and collect are the three things most necessary to any successful plant, all three of which are possessed in abundance by the Rome Brick Company.

After visiting the company's store and other points of interest and making a few pictures, we found we only had time to reach our hotel for a late dinner.

After noon we thought to take a peep at Mr. Morrison's new yard situated almost in the heart of Rome, and on the banks of the beautiful Oostanalla River, near its junction with the Ettawa. I could not resist the temptation to make a picture of the beautiful view here presented. In this, I confess I had a double purpose, one being that you might be tempted to visit this lovely spot, and, leaning against the cemetery fence, as I did, gazing across the river, see, under the bridge to the left, Morrison's brickyard. After making a few snap shots we retraced our steps across one of the bridges and found ourselves in the brickyard proper. Not finding Mr. Morrison in, we proceeded to prow around on a general tour of inspection.

We found a large Chambers machine, engine, boilers, building, mules, carts, etc., etc., including several well-filled kilns.

And at last, but not least, Morrison's bar, chained to which was the "old oaken bucket," which, by the way, only served to deceive the innocent passer-by. Being very thirsty I thought to try the "old oaken bucket" as of yore, when to my astonishment came from across the yard a shrill but warning voice: "Look out dah, Massa Morrison only use dat ar bucket for lecion purposes!" Imagine my disappointment, and yet great satisfaction in having, at last, learned, though at great risk, how Morrison became Mayor of North Rome. Well, I made a picture of this fountain just to show how natural and innocent "Massa Morrison" made it all appear.

I also made a snap shot at what I supposed was the yard office, but was afterward told that the real office where they kept the money was at the store about a block away. Just at this time our friend Morrison came into the yard, and after we had apologized for our intrusion, and had given ample assurance that we had not meddled with anything at the well, we were permitted to inspect clays, kilns, brick, etc., etc.

Mr. Morrison and his partner own several acres of clay lands on the bank of the aforesaid river. They use most of their own brick, being contractors. The company has done a good season's business and still had a good stock of excellent brick on hand.

If the business connected with the mayoralty does not interfere we may expect our President on hand at the first session of the Buffalo meeting.

Say! While I think about it, if I do not miss my guess some one who has political influence in Rome will receive from the incoming administration a good government appointment. Now, don't anybody object. It is all right. But! I am as ever your friend from the other side,

A. ROAMER.

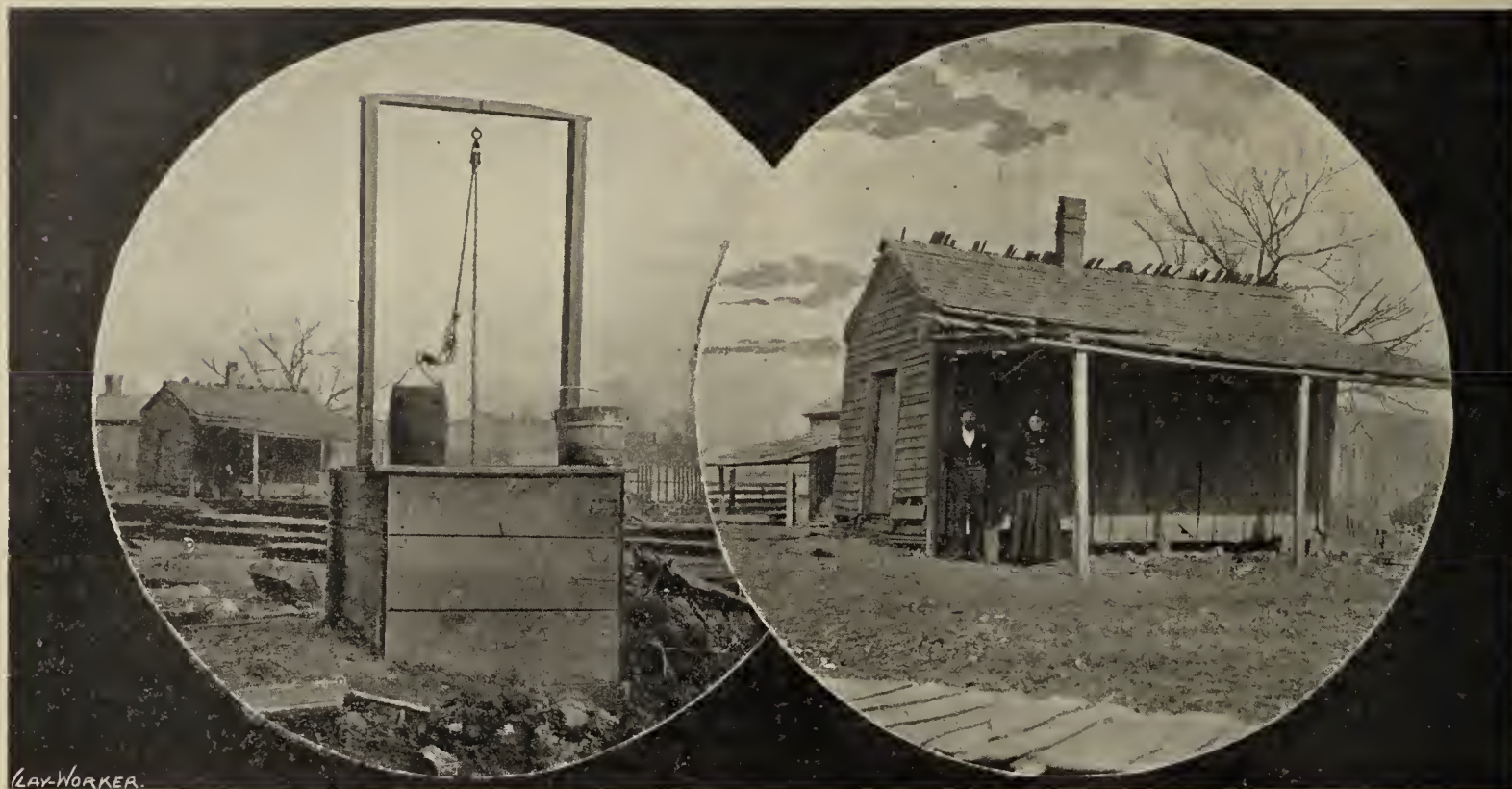
NEW ARRANGEMENT OF CONTINUOUS KILN.

A new system for arranging fires of a continuous furnace has been brought out by the "Societe Anonyme des Tuileries du Pottelberg," the features of which are as follows: (1) The use of a central aid conduit under the whole furnace, with a special branch for each compartment, which, with an opening for air placed opposite each hearth, permits complete regulation of the burning of the products by (a) opening or closing these openings for air in such a way as to supply the greatest amount of air under the fire box and stimulate the combustion wherever desired, or else (b) by closing the damper on the side where the heat is too great and thus prevent irregular burn-



ROME BRICK CO'S FLOOR DRYER, END VIEW.

ing, and so fire the entire compartment regularly throughout. (2) A lever damper to control the introduction of air. (3) Three openings (carreau) are placed in the top of the compartment, two on the edges and one in the center, to carry the gas of combustion and the evaporation of moisture from the wares to the chimney. Those on the edges are provided with hori-



R. B. MORRISON'S "OLD OAKEN BUCKET" AND OFFICE.

zontal dampers and that in the middle with a valve damper to regulate the exit of the gas, the action of which, with the aid of the air ducts below, may increase or diminish the combustion, and thus regulate the firing under all the compartments. These top openings are made of refractory tubes, with male and female ends, with joints fastened by refractory cement.

Written for the CLAY-WORKER.

THE BRICK INDUSTRIES OF GALESBURG, ILL.



THE CITY OF GALESBURG is the county seat of Knox county, Illinois, 163 miles southwest of Chicago. Knox county was long considered the garden of Illinois. It is famous for its enormous yield of corn, the intelligence of its citizens, its educational institutions, beautiful women, bright men, good horses and large manufacturing establishments. It was settled largely by New England people, who were drawn to it by its fertile soil, its salubrious climate, and the hills and valleys, which were to them a constant reminder of the dear country they had left behind them. Galesburg is now a city of about 22,000 inhabitants, and has within its borders Knox College, Lombard University and a large and prosperous young ladies' seminary. The professors in these institutions of learning and the monthly gatherings of attorneys to attend the sessions of court draw together a much larger proportion of educated, cultivated people than is usually found in Western cities of the size of Galesburg, or even much larger ones. These, with the large number of students and an unusually intelligent body of citizens, form a society very desirable to live in.

Mr. Joseph Stafford, a former resident of Galesburg, claims to have been the discoverer of the fact that the deposits of shale could be utilized for the manufacture of paving brick. Whether this is true or not, it is true that the paving brick made at Galesburg have a deservedly high reputation. The first company to engage in the manufacture of paving brick at Galesburg was the Galesburg Brick and Tile Company. Their works were located in Court Creek valley, about two miles east of the city. This company was organized by a retired lumber merchant of Chicago, Mr. A. C. Calkins, and was intended as a manufactory of dry pressed brick from the bed

of clay overlying the shale. When the shale was proven to be available for sidewalk and paving brick the works were changed to the stiff mud process, with dry pans as pulverizers. The history of this yard can be told in a few words. Inexperience, a broken dam, letting the contents of a large pond through the works in the middle of the night, a rebuilding, and within a year a disastrous fire which completely destroyed the machinery. Then a large mortgage, assessments on the stockholders, a reorganization, reduction of the capital stock, a few months of activity preparatory to the appointment of a receiver, a sheriff sale, an old, abandoned brickyard, and there you are.

The next yard to be established was the Galesburg Brick and Terra Cotta Company. They, too, have seen tribulation, have had a fire, poor burns and a full share of bad luck, but have had the nerve and perseverance to hang on until they are at present on a solid basis. They have forty acres of land, a large Frey-Sheckler machine and driers, two Frost Manufacturing Company's dry pans, Eudaly kilns, good engine, with plenty of power, a splendid bank of shale, and one of the best equipped and managed yards of its size in the country. This company has done its full share in giving to the Galesburg paving brick the high reputation they possess. The capital of the company is \$100,000, fully paid, and the General Superintendent is Mr. Albert Warren, who has earned the cognomen of "The Hustler." The capacity of this yard is about 10,000,000 yearly. Mr. Warren labors under the disadvantage of having assumed the charge of this yard after it was built, and has fully realized the inconvenience of a brickyard laid out by machinery men. They have a large and fine stock of pavers on hand, and have been running until recently.

Succeeding the Galesburg Brick and Terra Cotta Company in point of time, and about one mile east, were built the works of the Purington Paving Brick Company. This yard is equipped with two large sized Marion steam shovels, four large Chambers brick machines, eight Frost dry pans, two Corliss engines of 350 horse-power each, four Purington driers, fifteen Eudaly and twelve Graves kilns. Their annual capacity is 60,000,000. The management of the plant is in the hands of W. S. Purington, to whom is due a large portion of the credit of having made it the most convenient yard in the United States. He has a good deal of inventive genius, which has been exercised in the direction of saving labor, and all through the works

are little devices which do much work that otherwise would require men. He has an automatic car coupler on which there is no patent, but which never fails to do its work. This yard was established in 1890, and has had the usual experience of brickmakers, having been burnt out once. They have only run a portion of the past season, making about 25,000,000, and have on hand a splendid stock of pavers. The company has a capital of a half million dollars, fully paid up, and has no mortgages or debts. The output of this yard for one year would pave a roadway, ten feet wide, for almost sixty miles. I mention this simply to demonstrate that good roads are by no means an impossibility.

Between the works of the Terra Cotta Brick and Tile Company and those of the Purington Paving Brick Company is the plant of the Galesburg Paving Brick Company. They have a large tract of land, but labor under the disadvantage of having a railroad and street car line running through their property. This yard is a model of its kind. Its machinery plant differs little in its general appearance from the others, save that its boilers and engines were of a later date and intended to be of great utility. Their engine room is the finest I have ever seen on a brickyard. They have compound condensing engines and superb boilers. Their brick machinery is from the Wallace Manufacturing Company, and the quality of its output compares favorably with any of those previously mentioned. Like the others, they use the Frost dry pans and a steam drier, to which has recently been added a process of utilizing for drying purposes the waste heat from the kiln, which seems to work satisfactorily. The down-draft kilns in use by the other yards find no place on this. They built a Johnson continuous kiln, which, under the direction of Mr. Haigh, underwent radical changes, and the inventor, placed inside of the kiln in use at present, would fail to recognize his own bantling. I am not advertising down-draft kilns or traducing continuous kilns, and I approach the subject of continuous kilns with a good deal of

hesitation. I have watched the operation of this particular kiln for three or four years, and my conclusions, deliberately expressed, are that better paving brick can be burned in this continuous kiln than in any down-draft kiln I have ever seen. I believe I can select brick from the continuous kiln of the Galesburg Paving Brick Company that will show a smaller loss from the abrasion test than any ever burned in a down-draft kiln. There is a toughness to them that is the delight of the paving-brick maker. I am not familiar enough with the details of the results ascertained by use of this kiln to give figures on percentages of good and poor brick burned in it, but from observation while it has been in operation it has seemed to me that the percentages of No. 1 brick were certainly no greater than have been obtained by the other yards, which use down-draft kilns. The difficulty seems to me to be in controlling the heat so as to be able to burn fairly uniform all parts of the chambers. I believe that in the comparatively near future the efforts of progressive brickmakers will result in the development of the continuous kiln, both as to cost of construction and results, but I have never yet seen one that I would like to invest in for the burning of a material requiring the heat the Galesburg shale requires. For common building brick, in localities where fuel is dear, I would not hesitate to recommend them as at present developed. These four yards are connected with Galesburg by one of the best electric street railways in the United States. They all have excellent railroad facilities, being connected with the C., B. & Q. and Santa Fe, both trunk lines, and under able, courteous management.

It would hardly be fair to omit from this letter a brief notice of the Galesburg Vitriified Brick Company. The works of this company are on the C., B. & Q., at Wataga, eight miles from Galesburg. It is a snug, compact yard, in the midst of a large coal field, and, under the able management of Mr. E. S. Gunnell, is rapidly winning its way to success. I notice that while two or three years ago the Galesburg manufacturers



NIAGARA FALLS, A MIDWINTER SCENE.

scarcely thought it worthy of consideration, this year it has been thought prudent to ascertain what Gunnell thought when figuring on contracts. In quality of material and manner of doing business he ranks A 1, and is a dangerous competitor on small contracts. Tell your readers that it is for the interest of those who can possibly do so to attend the annual meeting of the Illinois Association on the 19th and 20th inst., at Galesburg, and that they will be warmly welcomed and well cared for. And now, with regrets that I could not have given you a better idea of the brick factories in the second largest brick manufacturing city of Illinois, and wishing you a happy New Year, I am very truly yours,

D. V. PURINGTON.

Chicago, Jan. 1, 1897.

Written for the CLAY-WORKER.

THE CLAYWORKING INDUSTRIES OF VICTORIA, AUSTRALIA.

BY F. A. CAMPBELL, C. E.



IN A NEW COLONY such as this, not yet fifty years old, the clayworking manufacturers are, as might be expected, engaged in work of a utilitarian rather than of an ornamental kind. Our houses have to be built before they can be ornamented or filled with artistic ware, so building brick stands at the head of the products of our yards. After this comes sewer pipe, fire brick, terra cotta of the flower and chimney pot order, and glazed earthenware such as is required for culinary purposes.

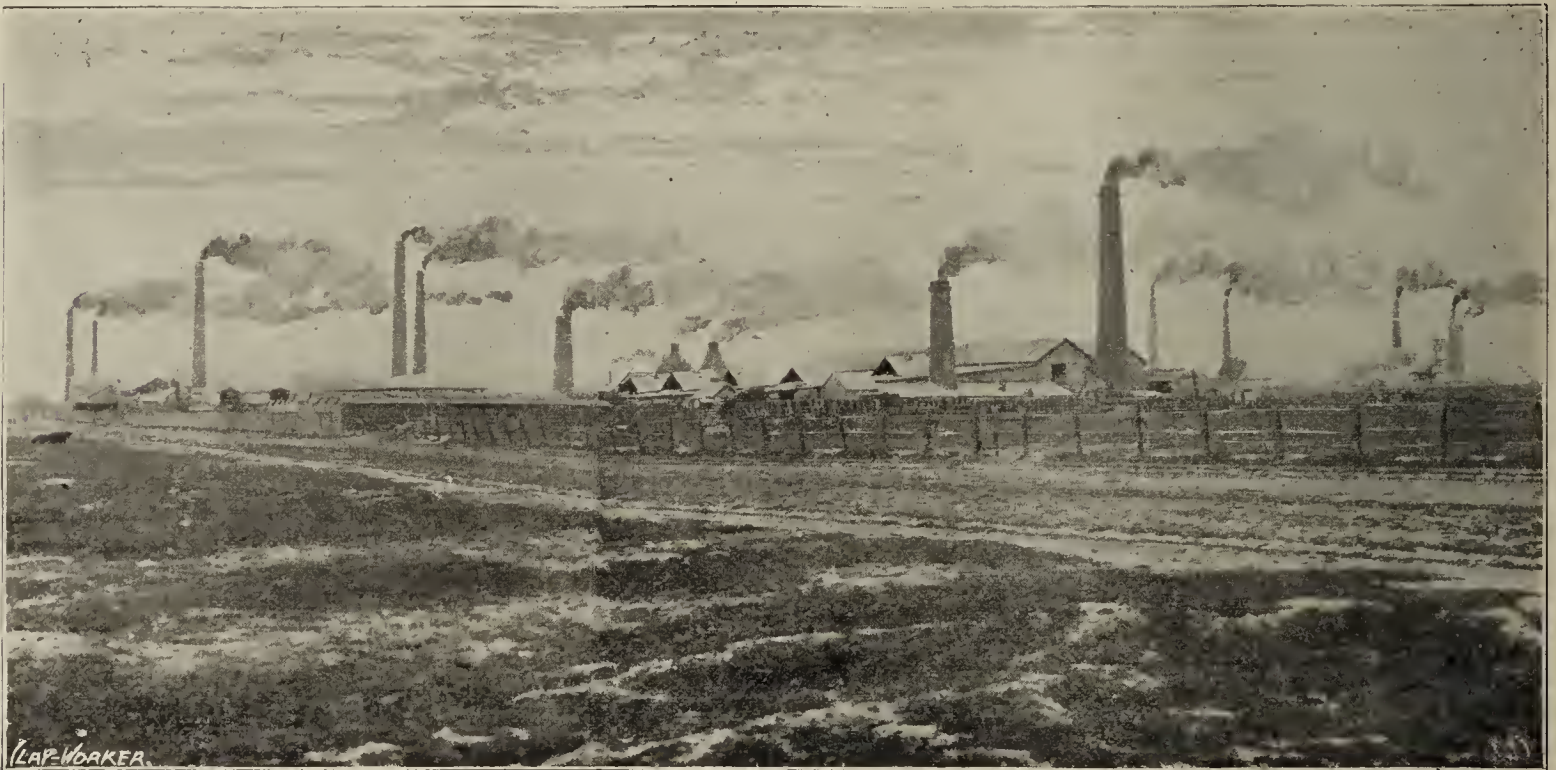
Every town and village through the land has its local brickyard and kiln, mostly primitive in style, making by hand slop brick or sand stocks only. Close to the larger towns the yards become more pretentious in appearance and more scientific in their methods, while near to Melbourne, the

within a few decades, out of burnt clay, means that this industry must have been, even if it is not so now, a very thriving one. Up to 1890 there is no doubt that it was so. For some years previous to that the demand was greater than the supply, and though new factories sprang up by the score, and most of them were working day and night, they could not keep pace with the orders pouring in from the building contractors. That time has gone by, and we are now suffering from a reaction. In common with all the civilized world, we are experiencing a time of great industrial depression. Many of the brickyards have closed, and the rest have been obliged to reduce hands and limit the output, while brick which a few years ago brought \$12 a thousand, until quite recently would bring only \$3.25. The present year, however, brings a more hopeful outlook. The demand is again springing up, and the price ranges from \$4 to \$5. The large scheme for the sewerage of the city, now being carried out by the Metropolitan Board of Works, has created a demand not only for brick, but for glazed pipe, and most of the leading establishments have added this branch to their business.

Good brick clay and shale is found most everywhere about Melbourne, but especially in the suburbs to the north of the city. The largest brickmaking establishment there, being at the same time the largest in Australia, is that of the Hoffman Patent Steam Brickmaking Company. Building brick and sewer pipe are made by them, and their works will form a suitable subject for description somewhat in detail.

—The Hoffman Patent Steam Brickmaking Company (Ltd.)—

The extensive property belonging to this company is situated in Brunswick, about four miles to the north of Melbourne. They own about 260 acres of land, all fine brick-making shale. The works were first started in 1870, a circular Hoffman kiln being erected, along with other necessary plant and buildings, brickmaking only being then carried on.



WORKS OF THE HOFFMAN PATENT STEAM BRICKMAKING CO. LTD., BRUNSWICK, AUSTRALIA.

capital, there are establishments with the most modern appliances, turning out brick equal to any in the world.

Melbourne, besides being the largest city in Victoria, is, by reason of the absence of suitable building stone in its vicinity, essentially a city of brick. Not only the bulk of the shops and small dwellings, but the mansions of the wealthy and many of the churches and large public edifices are composed of this useful material.

To build a city with a population of one-third of a million,

The company was at that time the sole proprietors in this part of the world of the Hoffman patents.

The appearance of the works as approached from the city is quite an imposing one, with its long range of buildings and clusters of great chimney stacks. The photograph, No. 1, will give some idea of the general appearance of the establishment from a distance. In the center are the pipemaking works; the newer brickmaking plant is on the left, while on the right, somewhat further off, is the first portion of the brickmaking

works erected. On the extreme right, just beyond where the poppet head is seen, is the original excavation. Standing upon the edge of this vast chasm, one could appreciate the Manager's remark that "Melbourne was built out of that hole." It must be nearly true, for the share which this company contributed towards the building of the city was a large one. Photograph No. 2 shows fairly well the extent of the excavation, but does not show its depth, which towards the far end is not less than 140 feet. Upon the top the circular Hoffman



THE BIG PIT.

kiln first erected, as well as a later rectangular one, are shown. Besides this historic hole, there is another excavation over by the newer works which is eighty-five feet deep.

From the surface to a depth of about fifteen feet there is a soft brown clay, which is stripped and thrown aside as not being suitable for use. From this point for about a hundred feet there is a hard, grayish yellow, stratified shale, from which the bricks are made without any blend or mixture. Below this, in the big hole, the gray yellow merges into a bluish gray, denser than the other, and from this the finest brick of all is made.

To convey the shale from the pits to the crusher two methods are employed. In the old pit a tunnel runs from the 140-foot level to a vertical shaft, over which stands the poppet head seen in the photograph. Up this shaft the trucks are brought in a cage to the level of the chute on the upper floor of the building, where they are emptied and lowered again to the bottom. In the new pit an inclined double tramway is used, the trucks being drawn by a wire rope worked at a high rate of speed by one of the numerous steam engines on the premises.

To keep these great pits free from water involves considerable expense, a powerful pump and engine being kept for this purpose.

The method of making brick is that known as the dry press system, the preparation of the shale, which consists in its reduction to a sufficient degree of fineness, being carried out in a very short space of time. Tipped from the trucks into a chute, it falls into a horizontal crusher provided with two strong shafts, set with heavy blades, revolving in opposite directions. Here the lumps are broken up, and the material then passes down into the disintegrators, which rapidly complete the operation. These latter machines are made on the premises. They consist of two parallel circular plates of iron, eight inches apart, carrying between them four series of crossbars, which revolve in alternate pairs in opposite directions, at a high rate of speed, within an iron casing. From the disintegrator the stuff falls into a revolving screen, with perforations of three-eighths of an inch in diameter. That which does not pass through is returned by an elevator to the first machine again; that which does pass is carried up and delivered right over the brickmaking machines, falling

through a hopper into the vertical pug mill attached to each.

The presses consist of five Bradley & Cravens patent two-mold machines, each capable of turning out 18,000 per day, and two Platts machines, one a powerful four-mold, with a capacity of 24,000 per day. This is a very fine machine, of great strength and simplicity of parts, the general appearance of which is shown by the accompanying photograph, No. 4. A vertical pug mill is attached to all of these machines, into which a small jet of water plays, to give the clay the necessary degree of moisture, and the molds are kept warm by a steam pipe.

From the brick presses the brick are placed on a car and run on a tram line straight into the Hoffman kilns, where they are stacked for burning.

The kilns of the company are of two kinds—the Hoffman continuous kiln and the Foster railway kiln. The principle of the first must be so well known to you as to render a detailed description unnecessary. There are, altogether, four Hoffman straight-sided and round-ended kilns, of sixteen chambers each, and one circular kiln of twelve chambers. Each chamber holds 22,000 brick, and the output of the larger kilns is about 240,000 per week.

The firing is done as usual, from above, fine screened coal being the fuel, fed by hand with a scoop into the feed holes. From four to five tons will burn a chamber of 22,000, and about ten days are required to complete the burning. The price of coal is \$3.25 per ton. When cooled, the brick are loaded into railway trucks, which run in on a siding right up to the kilns. The Hoffman kilns belonging to the company are of most substantial construction, and, with the great chimney stack in the center, have a fine appearance.

The Foster railway kilns may be more novel to you, so a more detailed description, with the accompanying photos, 5 and 6, is offered. There are two of these, each about two hundred feet long. A line of rails is laid through them, starting at the brick presses and ending in a series of docks, alongside a railway line, and then back along the outside of the kiln to the starting point. The peculiarity of these kilns



TRAIN LINE INTO NEW PIT.

is that the brick are burned on the cars. These are constructed with a strong frame of rolled iron joists, carrying a brick floor, upon which the green brick are stacked. An end view of the car is shown in photo No. 6. The firing is continuous and the kiln is always full. As a burnt carload passes out at the far end a green carload is admitted at the near end. The cars hold 5,000 each, and take about ten days to complete their trip through the kiln. As in the Hoffman, the firing is done with screened coal, fed through holes in the top, but

this firing is confined to about one-third of the length of the kiln towards the exit end. Thus the cool air coming in at the exit end passes through and is heated by the cooling brick, attains its greatest heat about the center, and is drawn through the green brick by the flues near the entrance end, which leads into the chimney stack. In this way it would appear that the very best use is made of all available heat, and, further, as compared with most other kilns, that two handlings are saved. The trucks are drawn through by a wire rope, worked by an engine between the two kilns.

The brick made by this company have always borne a high character. They are extremely hard and durable. In the molds they are 9x4x3 inches, shrinking, when hard-burned, one-quarter to one-eighth of an inch. The average weight is 110 pounds per cubic foot. In compression they are very strong, as the following comparison will show:

English strong red, 600 to 1,100 pounds compression per square inch; Victorian Hoffman, 800 to 2,000 pounds.

They cracked at the lower figures quoted and crushed at the higher.

To show the resources of this establishment in their brick-making department, it may be stated that during a part of

being applied. From this they go to the kilns. There are eight of these, all down-draft, 24 feet in diameter, each pair being connected with a chimney shaft.

The firing is done with ordinary coal, about fourteen tons

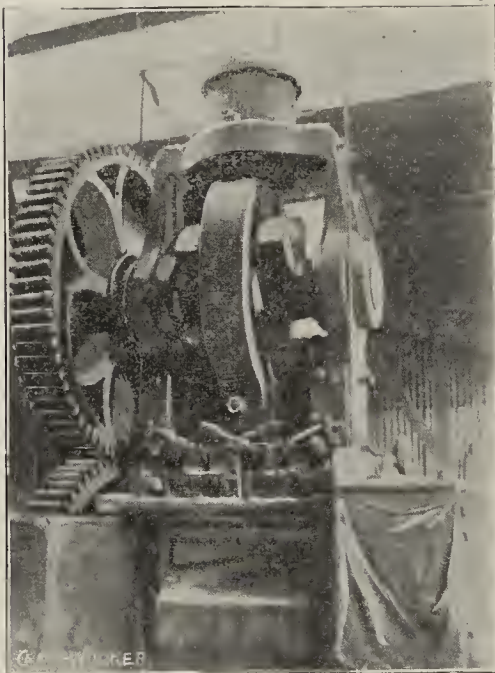


FOSTER KILN, END EXIT.

to each kiln, the length of time of burning being five days. At the end of the burning they are treated with salt for the glaze, and then allowed to cool down. All sorts and sizes of glazed pipes are made, from 3 to 24 inches diameter, bends, junctions, reducing pieces, etc. The output at present is about 5,000 pipe per week, including all sizes. The prices range from 14 cents each for 3-inch pipe to 75 cents for 15-inch. Above that size they are required only for special work, and are tendered at special rates. The high quality of the pipes now being turned out by the Hoffman and other companies is due to a great extent to the standard fixed by the Metropolitan Board of Works for the pipe required by them for the sewerage work.

The power for driving the machinery at the works is supplied by four 300-horse-power steam engines, with supplementary smaller ones for drawing the clay from the pits, pumping water, etc.

All repairs are carried out on the premises, as well as the manufacture of much of the machinery used. There are turning and fitting, blacksmith and carpenter shops, supplied with first-class appliances. The lathe in the first named will take in work twenty-five feet long and seven feet in diameter, and the planing machine will work castings up to four tons in weight. A complete set of duplicate parts of every machine



PLATT'S PATENT FOUR-MOULD BRICK PRESS.

the year 1888 two million brick were turned out per week, working twenty hours per day.

The manufacture of sewer pipe was commenced in 1888, but it is only within the last two years or so that this department has attained its present dimensions.

A different clay is used for this, procured from the far end of the company's land. It is very carefully treated before being brought to the press. The manufacture of these pipes to meet the requirements of the Metropolitan Board of Works is no easy task, and the present Manager must be congratulated upon having brought this part of the business to the same high standard previously maintained in regard to the brickmaking department.

The clay, which is of a light gray color, is passed in succession through two sets of rollers, dry pan crushers and pug mills, where it is thoroughly ground, blended and mixed with the approved quantity of "grog"—that is, ground-up burnt pipe and tile. It is then elevated to the top floor and fed into the steam presses. Of these, there are two of Dalton's patent, the larger being a very powerful machine, with a cylinder 4 feet 6 inches in diameter, capable of turning out pipes up to 24 inches in diameter. From the presses the pipes are placed on end in the drying sheds, where they stand from ten to twenty days, according to the weather, no artificial heat



FOSTER KILN, Side Showing Construction of Trucks.

used is kept in store, and when anything is removed for use, its place in the store is supplied again.

The stables are in keeping with the rest of the establishment, being provided with stalls for forty horses.

Before closing the description of this fine establishment it should be mentioned that the Chairman of Directors is Wm.

Smith, a well-known and prominent Melbourne citizen; the Secretary, J. C. Foden, and the Manager, until recently, Stephen England. Although Mr. England has been connected for

The representative of the Clay-Worker, who was a welcomed guest of the association, could not but notice what an advantage it was to have such a hearty spirit of co-operation to govern all the work which was brought before this Convention. Practical questions, business-like propositions, wise and conservative opinions, friendly advice and unanimous resolutions were the single order of their proceedings.

The first general expression was, "We have come for business, and we intend to complete it before we go home."

After the address of the retiring President the next order of business was the election of officers for the ensuing year, which resulted as follows: S. D. Horton, of Peekskill, N. Y., President; B. S. Fox, Reading, Pa., Vice President; B. C. Pierce, Taunton, Mass., Secretary, and John G. Williams, Taunton, Mass., Treasurer, by a unanimous vote.

In the absence of President-elect S. D. Horton, Vice President B. S. Fox took the chair, and with a short address proceeded to the order of business.

Cordial votes of thanks were tendered the retiring officers by standing vote.

The Secretary's report was read, and, being a cheering one, was duly approved.

The Treasurer's report was a very agreeable one, for it showed an increasing balance in the treasury in favor of the association. One item is worthy of the notice it received. It was an item for interest upon balance in bank. This was due to the Treasurer keeping the funds in a savings bank instead of in a national bank.

An adjournment was next taken to reassemble in an adjoining



SWEET'S BRICK AND PIPE WORKS, Brunswick.

many years with the company in other capacities, he only assumed the management two and a half years ago. During this time he has paid special attention to the development of the sewer pipe department, and with eminent success. The works are a credit to the management generally, and form a good example of the enterprise shown by Victoria business men, who, when they take anything in hand, are not satisfied with less than the best.

ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF STOVE LINING FIRE BRICK MANUFACTURERS.

THIS ASSOCIATION, which is a separate section of the National Association of Fire Brick Manufacturers, began its Eighth Annual Convention at noon, Dec. 15, at the Broadway Central Hotel, New York.

The Convention was called to order by President H. S. McLeod, of Troy, who delivered a short but very interesting address, explaining the special work which had been done in the year just completed, also the objects and the results of his visits to several of the stove lining manufactories of the United States. The address was greatly appreciated by all the members present. There was a very full attendance at this Convention, 90 per cent. of the enrolled manufactories being personally represented.

When we recognize the fact that this association embraces in its membership more than 90 per cent. of the total stove lining brick factories of the United States, it is very easy to understand how effective it must be in its operations. It is an association of brickmakers who are filled with a real sentiment of faith in the advantages of co-operation. President McLeod well defined the secret of its success when, in his address, he said: "I have been asked, 'What is there for me in your association?' I always reply, 'That is not the way to look at it, but rather ask yourself, 'What is there in me for the association?'" "

The welfare of each is contained in the welfare of all. The success of every one is helped by this co-operation, and the present condition of this business, notwithstanding the general business depression, shows most conclusively that this association has not only been intelligently managed, but that it has won and has the confidence and good will of its members through the benefits it has procured for them.



S. ENGLAND, Manager the Hoffman Co.

ing room for the discussion of a "pow-wow," as is usual with brickmakers. The banquet was served by the host, Tillie Haynes, in his very best style, under the superintendence of

Assistant Steward Charles A. Bloomfield, which is a sufficient guarantee of its quality, and also of its quantity.

The second session was called to order after the banquet by Vice President B. S. Fox, and the business resumed by the introduction of Mr. Helmer, a new member, representing the old established works of Edward Hall & Sons, of Buffalo, N. Y. The enrollment of Mr. Helmer's firm is due in a great measure to the efforts of H. S. McLeod, and it will doubtless prove a great mutual advantage to both the new member and the association, because Mr. Helmer is a thorough gentleman of large business attainments, and will prove to be a wise counselor. He represents a very extensive manufactory of fire brick.

The progress made with the work of this Convention was so rapid, owing to the general concurrence of the members, that it was completed in two sessions, and when the final adjournment came every one felt that its work had been very satisfactory to all concerned, and that the outlook for 1897 was hopeful, showing some evidence of renewed prosperity.

The following manufacturers took part in the discussions of the Convention: Mr. Pierce, Presbrey Stove Lining Company, Taunton, Mass.; Mr. Mabey, Horton & Mabey, Peekskill, N. Y.; Mr. Fox, E. S. Fox & Co., Reading, Pa.; John G. Williams, Williams Stove Lining Company, Taunton, Mass.; Mr. Francis, Dighton Stove Lining Company, Dighton, Mass.; Mr. Lincoln, Union Stove Lining Company, Taunton, Mass.; Mr. French, French & Winslow Stove Lining Company, Taunton, Mass.; J. W. Parker, Taunton Stove Lining Company, Taunton, Mass.; Mr. Rogers, Latshaw, Rogers & Co., Royer's Ford, Pa.; Mr. Latshaw, Latshaw, Rogers & Co., Royer's Ford, Pa.; Mr. Perkins, Perkins & Pitts Company, Stamford, Conn.; Mr. McLeod, McLeod & Henry Company, Troy, N. Y.; Mr. Helmer, Hall & Sons, Buffalo, N. Y.; Mr. Newton, Newton & Co., Albany, N. Y.; Mr. Flagg, Geo. Sweeney & Co., Philadelphia, Pa.; Mr. Hyser, Hyser & Lewellyn, Philadelphia, Pa.; Mr. Jones, Ostrander & Co., Woodbridge, N. J.

We regret that our friends of the N. A. of F. B. M. did not meet, as usual, with the Stove Lining Fire Brick section, but the following letter, which was sent to the members, will best explain the reason for their not holding their usual Convention:

JAMES TAYLOR,

107 Beekman Street, New York, Dec. 10, 1896.

To the Members of the Association:

Gentlemen—I am requested by the President and Chairman of the Executive Committee to advise you, after a conference with some of the members of the association, that they would not send out a notice of the annual meeting in December, as they had done for many years, as there was no special business that required attention, and concluded to wait the result of the present session of Congress. Should they not pass the Dingley bill, and a new tariff bill should be presented to this or a special session of the House, an effort would be made to have again a specific duty restored, etc., and the same as previous to the Wilson bill.

Should five or more members of the association deem it advisable to meet in December or January, and will advise me, a call will be sent out immediately.

Your Secretary has served this year without compensation, and will till such time as the association shall do some active work. I shall be pleased to hear from all the fire brick manufacturers and those interested in the clay industry, and receive any suggestions as to the future work and submit them to the officers of the association.

Wishing you all a prosperous New Year, I remain your humble servant,

HENRY GLEASON,
Secretary N. A. F. B. M.

OVERWHELMED.

Since the publication in the December number of the Clay-Worker of the communication which I sent you we have been flooded with letters, asking us to send blanks for making out the different forms of statements. Two things are very evident from the number of applications we have received: First, that the Clay-Worker is read by brickmakers far and near, and, second, that the balance sheets that different parties have taken off this year do not seem to be just the proper thing, or are

not entirely satisfactory. They will find, after filling out some of these blanks, that they will wish they had something a little different. This year we have found some of the statements we have taken off look that way.

We closed down on the 31st of December, but are doing quite a little work in changing our kilns on No. 1 yard so that we can use coal. Hoping to meet you at the coming Convention in Galesburg on the 19th, I am yours truly,

W. S. PURINGTON.



THE JEWETTVILLE BRICK WORKS—PART OF CLAY BANK—BREAKING GROUND FOR A NEW KILN—ENTRANCE END OF STEAM DRYER.



IN AND ABOUT THE ELECTRIC CITY.

BUFFALO is already among the greatest of American cities, and with the advantage of cheap and unlimited motive power, which is now being supplied by the Niagara Falls power house, she will undoubtedly outstrip many, if not all, of her rivals in the race for commercial and industrial supremacy. Her 150 miles of street railways are now run by electricity from Niagara, and in good time the machinery in all the factories may be set in motion by the shifting of a switch. Then the furnace fires may die out, the smoke stacks of the factories and shops cease to pollute the atmosphere with their smudge and soot, and yet the wheels of industry will spin and whirl with unceasing vigor. This is the one thing necessary to make Buffalo a model city, for she has already all the other essentials, being now the sixth commercial city in the world. Her population is now nearly 400,000, and she has within her control 328 miles of paved streets, being the best paved city

than those built of wood. It is the duty of the brickmakers and architects to demonstrate this fact. Prove to a builder that a well-built brick structure is a better investment, permanency considered, which it is, than the frame houses they are putting up, and an increased use of brick will follow.

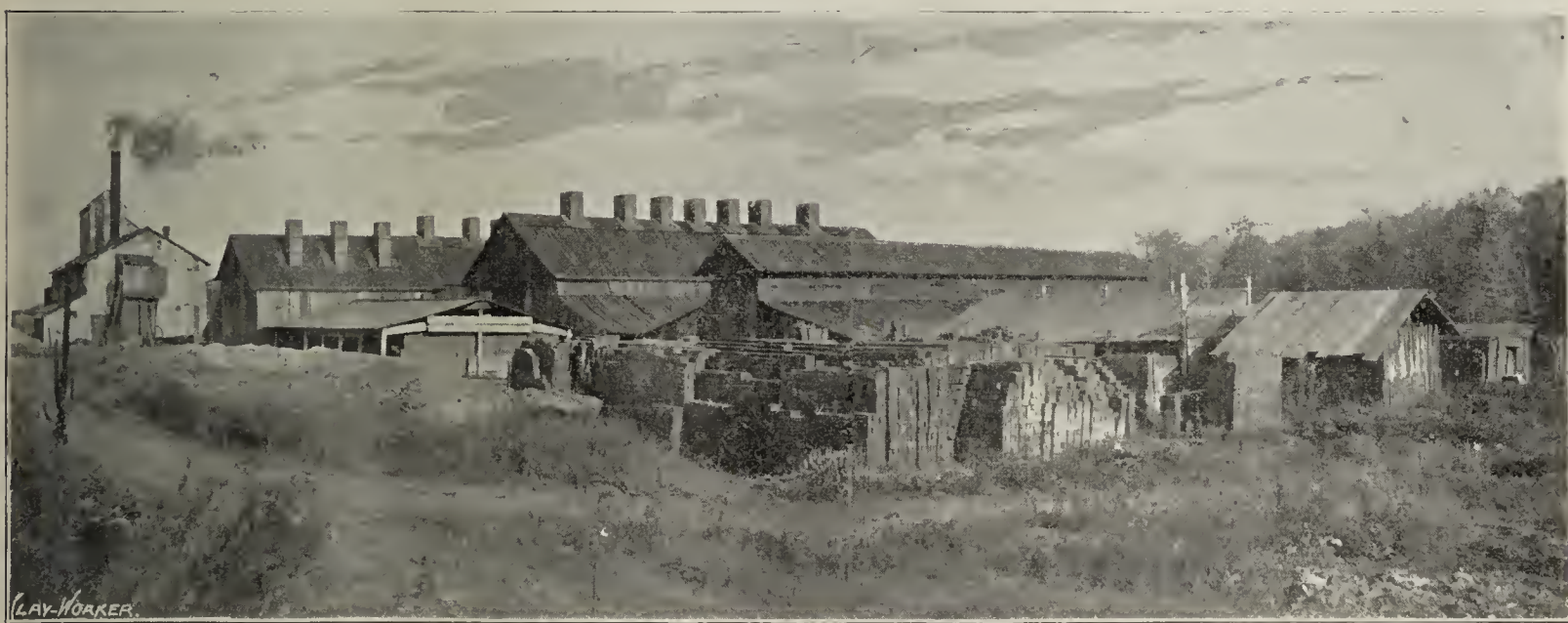
Buffalo's first brick structure was erected about 1812, the brick being made by hand, of course. As far back as 1865 brick were made near Buffalo by the dry press process, on what was then known as the Woodruff machine, which was for some reason taken elsewhere, it is thought to St. Louis.

—Buffalo's First Dry Press Brick.—

On Main street, the principal business thoroughfare, three blocks south of the new Tiff House, where the brickmakers will stop during the coming Convention, there stands a four-story structure, in which was used the first dry press brick made in this section. So far as the brick are concerned the building is as good as when first erected in 1865, and stands a monument to the durability of dry press brick. At that time the brickmakers were skeptical on that subject, so the experiment, as it was then considered, was watched with much interest. Being convinced that well-burned dry press brick were as durable as those made by the old methods, Mr. Geo. W. Schmidt finally resolved to go into the dry press business. After prospecting diligently for some time, a large tract of excellent shale was located near Jewettville, a little station fourteen miles out on the B., R. & P. Railway. Mr. Wm. H. Brush was let into the secret, and as a result a partnership was formed and Buffalo's first successful dry press brick plant was established in 1891.

—The Jewettville Brick Works.—

The undertaking proved more formidable than was at first supposed, for while both Mr. Schmidt and Mr. Brush are life-



THE JEWETTville BRICK WORKS—Rear View.

in America, having more asphalt, even, than Paris. With unequalled shipping facilities by water and twenty railroads to freight her products to every quarter, there is no imagination keen enough to outline the limits of her possibilities.

—Buffalo Is Not a Brick City.—

Her brickmakers complain of the marked tendency of her builders to use combustible materials, particularly in resident districts, and predict that some day a great conflagration may result. This ought not to be, and no doubt the next decade will show a decided movement in favor of brick structures for dwellings, as well as for commercial purposes.

There is every reason why this should come to pass, for building brick of all grades are to be had from her own manufactories at prices which insure cheaper homes in the long run

long brickmakers, and understand thoroughly every detail of the tempered clay process, they found that they had much to learn, and unlearn, too, in the dry press line. They now agree that, of the two, the unlearning is really the most difficult task. A leading dry press machine manufacturer said to the writer recently that he would prefer to install a plant for a sensible business man who knew nothing at all about brickmaking than to start an old-fashioned brickmaker in the dry press process, no matter how well posted he might be in other methods of manufacture. Probably Messrs. Schmidt and Brush will concur in this opinion, for while they worked out their own salvation at Jewettville, they had to lay awake nights to do it. They neither of them ever do things by halves, so, to insure an unfailing supply of raw material, they purchased two hundred

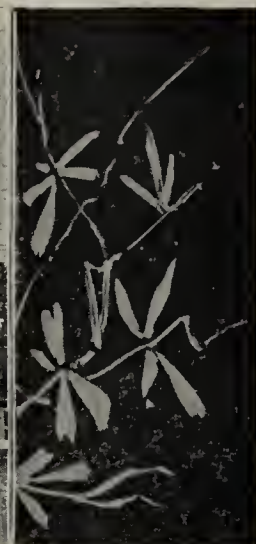
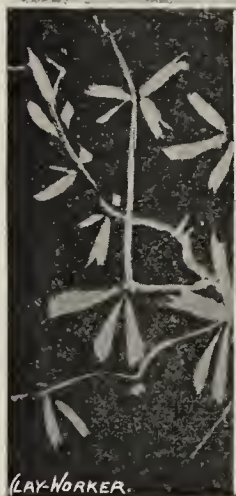
acres of land, a mile of which fronts the railroad. There are, to start with, one or two feet of rich soil, beneath which there is a five-foot vein of plastic shale, and then hard blue shale to a depth of 150 feet—as far as they have gone. The upper shale burns a beautiful dark red. They originally intended to make only front brick, but may ultimately turn their attention to vitrified pavers.

The original equipment consisted of a four-mold Boyd press, with which they are well pleased, and the usual screens, elevators, etc. The clay is gathered in the customary way and stored under an immense shed, from which, after lying for a few months to "cure," it goes to a Boyd dry pan, then by cup elevators is carried up to the top of the story above and dropped on to a stationary screen set at an angle of 45 degrees, and from that to the press. They at first tried a revolving screen, but it didn't give satisfaction. Then a shaking screen was tried, but the clay "built up" on it so quickly that it, in turn,

and chimneys extended up through the top or crown of kiln, which was arched with fire brick. These kilns work fairly well, but Mr. Schmidt is of the opinion that he would have saved some little money and a great deal of worry had he taken the advice of Mr. Flood, who installed the machinery, and built good down-draft kilns of approved pattern at the start.

—Drying Dry Press Brick.—

To facilitate the burning process, which was not giving the capacity desired, Mr. Schmidt designed and built a steam drier, which has some novel features and which works fairly well. With a view of avoiding the expensive item of fifty or a hundred dry cars, he built a large number of extra heavy pallets and two cars with a movable top, which by a clever device could, with a lever, be raised or lowered an inch or two. Along the sides of the tunnel, on a level with the top of the car when in a raised position, were fastened 2 by 4-inch strips. A car is loaded with brick pallets and run into the upper and down to the lower end of the tunnel, the lever shifted, letting the bottom pallets rest on the 2x4 strips, and the car drawn out for another load. When a tunnel is filled in this manner the doors are closed and heat turned on, and as soon as dried a similar car is brought into use and the pallets lifted and wheeled to the kiln, a load at a time. Thus two cars do the work of fifty



THE LANCASTER BRICK CO'S WORKS AND WORKMEN.

was abandoned for the stationary eighteen-mesh screen. This is still used, and it keeps a boy busy most of the time pounding the clay loose as it gradually accumulates at different spots.

—It's Always the Unexpected Which Happens.—

Their clay is peculiar, as was learned at the beginning. Starting late in the fall, the very first batch of brick was frozen so they stuck together. They showed signs of being badly checked, and it was concluded to be a waste of fuel to burn them, but being curious to see how they would come from the kiln they were set and burned. Much to the surprise of all, they came out all O. K., something which could not be hoped for with most clays. Mr. Schmidt had ideas of his own as to the kind of kilns required, and accordingly built several large square up-draft kilns with heavy walls. It did not take him long to see that these would not do for dry pressed brick. He burned the brick, but the fuel bill was enormous and the arch brick nearly all N. G., so he dug out the bottoms and put in permanent floors and built a thirty-six-inch wall lengthwise through the center of the kiln. In this wall flues were built

by the usual method. The tunnels (there are ten) are sixty feet long, each, thirty inches wide and about five feet high. There are no stacks, the vapor escaping through openings in the ceiling. A series of seven pipes are run the full length of each tunnel. Brick are dried bone dry in twenty-four hours.

A year or two ago, when the bottom fell out of the pressed brick business, they put in a Bonnot centennial tile machine, pug mill, etc., and begun the manufacture of hollow brick. These are made of common brick size, cut double length. In this branch Mr. Schmidt learned several things. One is that clay shrinks to a common center. He thoughtlessly expected the opening or hollow space in the brick to be larger in the burned brick than in the green brick. This is not the case, the shrinkage in brick reducing the hollow space equally or proportionately with the shell. This, he thinks, should be figured



on in making the dies, else the hollow space may not be as large as desired.

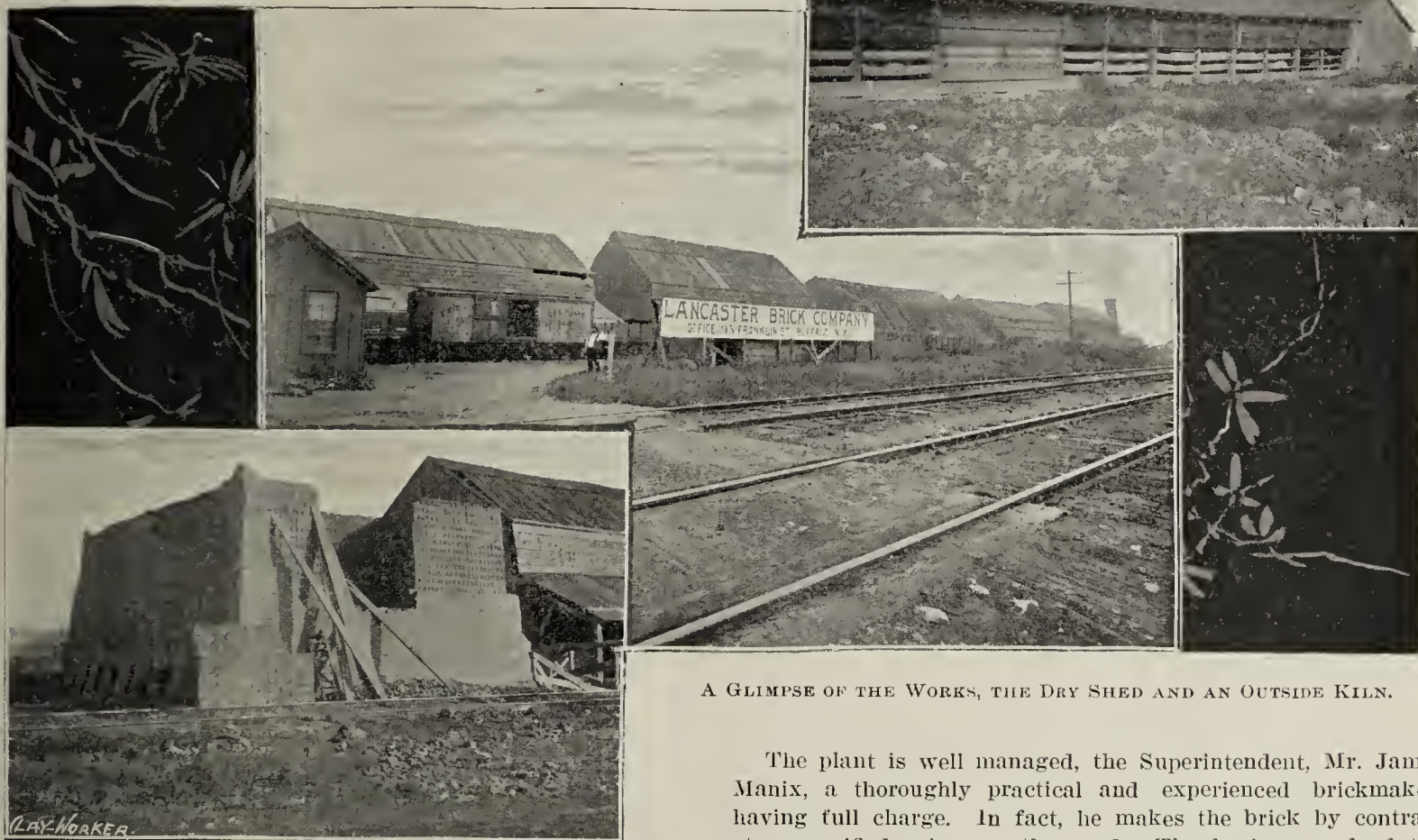
Their clay is thought to be well suited to the manufacture of paving brick, so they are thinking of equipping the plant with necessary appliances for that branch of the business. There are no paving brick plants anywhere near Buffalo, so that branch ought to prove lucrative, for the city already has several miles of good brick streets, the superior wearing qualities of which, as compared with asphalt, will create a demand for more of the same sort when the taxpayers realize the situation.

—The Lancaster Brick Company.—

Under this title a company was organized in 1888 and purchased what formerly had been a hand yard, brick having been made on the ground purchased for thirty-five years. The works are located near Lancaster, a little town on the Erie Railway, about thirteen miles from the city. A switch from the Erie was put in, kilns built, all the necessary appurtenances for a yard purchased, and about two million brick made that year. The next season they made four million, the following eight million, and again increased to ten million in 1893. A large per cent. of their brick is sold in Buffalo and the balance goes to surrounding cities.

The plant consists of two Martin soft mud machines, a Potts

The making of hollow brick and drain tile has grown to be an important feature. The latter are intended for local use, and only small sizes are made. The bulk of their hollow brick are made common brick size— $2\frac{1}{4} \times 4 \times 8$, burned. They shrink one-half inch in length and one-quarter inch in width. Some larger sizes are made, mostly $4 \times 5 \times 13\frac{1}{2}$, burned. Headers are made five inches wide. These, laid on the flat, make a good bond, as will be seen by sketch on page 35. These blocks are dried in racks under sheds, the sides of which may be opened when the weather is propitious for rapid drying. They are burned in round down-draft kilns holding 100,000 common brick size or 30,000 of the 4×5 . To facilitate watersmoking a well has been built under the center of these kilns, eight inches in diameter and two feet deep. A flue, 12×17 inches, connects with a stack built especially for this purpose. It is just a little higher than the kiln, and gives ample draft for watersmoking. The hollows are burned in five days when set dry.



A GLIMPSE OF THE WORKS, THE DRY SHED AND AN OUTSIDE KILN.

stock brick machine, two Wellington and one Potts brick mold sanding machines, a Frey-Sheekler "Acme" stiff clay machine for hollow brick, tile, etc. There are five up-draft kilns and three down-draft. The company's property covers 106 acres, and the clay deposit is practically inexhaustible. At first they stripped the top soil, but now use it with the first three to four feet of clay. The clay, which is very strong, averages about thirty feet in depth.

The Martin machines are only run in summer, the clay first going into the conventional soak pits. The Potts machine is not so hampered, the clay going from bank in automatic dump cars to a Potts disintegrator, and thence to the brick machine. This plan the Superintendent likes the best and considers the most economical. The brick are dried by rack and pallet system and burned in common clamp kilns, $26\frac{1}{2}$ feet wide, with permanent walls. They usually set forty-two high, but sometimes go up to fifty. They dry off with coke in about three days and finish with coal in five days.

The plant is well managed, the Superintendent, Mr. James Manix, a thoroughly practical and experienced brickmaker, having full charge. In fact, he makes the brick by contract at a specified price per thousand. The business end of the firm's affairs is looked after by O. J. Swegles, Secretary, who is a non-professional brickmaker of the new school and a most kindly and companionable gentleman of the old school, to whom we are indebted for many favors.

In company with Mr. Swegles we visited the only other brick plant in this quarter, that of

—The Buffalo Star Brick Company,—

Located some three miles nearer the city. The works were built in 1888, and were acquired by the present owners the following year. They have thirty acres of fairly good clay, which, unfortunately, contains a great many small stones. To get rid of these the clay is passed through a revolving conical screen, eight feet in length, fifty-six inches in diameter at one end and forty-two inches at the other. It is made of one-eighth-inch sheet steel, quarter-inch perforations, half-inch pitch. A shaft with arms attached revolves within this screen. The clay goes in one end and the stone out the other. Originally the

works were well arranged and equipped as an all-the-year-round plant, having six large kilns, a Sharer drier, one Penfield stock brick machine and one Creager soft mud outfit, all

part in the building of western New York. They were pioneers in the fire-proof business, Mr. Francis Lyth having invented and introduced the hollow tile arch at York, England, in 1851.

He and John Lyth first manufactured and tried to introduce hollow building tile in this country in 1857. It was ten years later before the demand was sufficient to justify the operation of a small plant for this ware exclusively. Now they have a great factory at Angola, a few miles west of Buffalo, which gives employment to hundreds of men the year round, and turns out thousands of tons of fire-proofing of the most modern patterns. There is scarcely a building of any prominence in Buffalo in which their ware has not been used. In addition to fire-proofing materials, they have for years been extensive manufacturers of sewer pipe, operating an immense plant at Wellsville, Ohio. Mr. Alfred Lyth, who has charge of the Buffalo branch, is a broad-gauge clay-worker, as our readers may see by a glance at his handsome face, pictured on the following page, and will be pleased to



A GROUP OF THE STAR BRICK CO'S EMPLOYEES.

of which worked satisfactorily. The latter was abandoned a year or two since, and a Hilton machine was installed in its place. At the time of our visit the plant had a forlorn appearance. The demand for brick had been so light that the yard was not run at all one year, and the Hilton machine alone was operated during the summer months of the past year.

Mr. C. H. McCutcheon, President of the company, and who chiefly directs its affairs, like Mr. Swegles, is not a professional or natural-born brickmaker, but was drawn into the business by an investment. He has other and more important business interests requiring his attention, so the brickyard is a secondary consideration, but affords opportunity for recreation, in pursuit of which he is gradually acquiring a great deal of experience, and in time will doubtless develop into a full-fledged practical brickmaker, and, being genial and clever, will be welcomed into the ancient guild by the entire clayworking fraternity.

—Buffalo's Oldest Clayworking Establishments.—

In these sketches we have mentioned only the yards which are furnishing the building brick for Buffalo and vicinity. There are other clay manufactories within the city's boundaries which are well worth visiting, and we can assure the members of the N. B. M. A. that, should they take the time and trouble to call, they will be made welcome.

The oldest clayworking establishment in the city probably is the fire brick works of Hall & Sons. The factory is easily reached by street car, and the latch string hangs out. The works were established in 1866 by Alfred Hall as a branch of the Perth Amboy, N. J., concern, which was operated by that pioneer in the fire brick business, and which is still owned and controlled by his descendants. The Buffalo works are now under the direction of C. M. Helmer, Manager, who is ably assisted by Mr. Jas. Wolstenholme, the Superintendent. Both are very pleasant gentlemen and good entertainers. The plant is devoted chiefly to stove and furnace blocks, and has turned out some enormous pieces for special purposes. A large portion of their clay is brought by boat from New Jersey.

A few yards beyond this plant is the extensive works of the Buffalo Sewer Pipe Company. Great piles of glazed pipe of varying shapes and sizes, covering acres of ground, tell as plain as words the character of the plant, which is an old one. Here, too, visitors are given the freedom of the works, and stand a chance of getting lost if they make the rounds without a guide, for the plant is large.

Perhaps no firm name is better known among clayworkers, particularly old-timers, than that of John Lyth & Sons. Established in the fifties, the Lyths have played a very important

have any of the members of the N. B. M. A. visit the works at Angola, which will probably be in operation during the coming Convention.

THE OHIO STATE CONVENTION.

THE EIGHTEENTH ANNUAL MEETING of the Ohio Tile, Brick and Drainage Association will take place on Feb. 12 and 13, at Zanesville, O., in the hall of the Board of Trade, which has been courteously placed at its disposal.

The full programme for the meeting will not be issued until Jan. 25, but enough is now known to make a strong list of timely and interesting discussions a certainty. The opening meeting will occur at 9:30 a. m., on the 12th. The afternoon will be employed in an inspection of the plants of the Mosaic Tile Company and the J. B. Owens Pottery Company, both most interesting establishments. The evening will be devoted to a second session for papers and discussions. The next day will be used for inspection of plants or devoted to routine Convention work, as the association may decide. Invitations have been received from all of the finest clayworking industries of Zanesville, including tile works, potteries and brick works, for the association to visit their plants, and the members will find this an opportunity not to be missed.

It is hoped that the clayworkers of the State, of every line, will embrace this opportunity to attend the Convention and ally themselves with it. All prospects point to a most enjoyable



A GLIMPSE OF THE LANCASTER BRICK CO'S HOLLOW WARE PLANT.

and profitable time. One-half rates to Zanesville from all points in Ohio will prevail on the 11th, 12th and 13th.

Address all matter for question box and all other communications to Prof. Edward Orton, Jr., Secretary, Columbus, O.

Written for the CLAY-WORKER.

HOW TO INCREASE THE USE OF BRICK.

BY J. W. CRARY, SR.

THE proprietor of a large brick plant wants me to "write to favor the sale of brick." The market interest in brick is a new and very important question with brickmakers, and also with the general public. It is important to the brickmakers because they want to increase the sale of brick. It is important to the general public because they want to lessen the risk of loss in property and the burden of taxation by insurance. In order to accomplish this desirable object the brickmakers must make good brick at a reasonable profit, and then take the trouble to show the general public, by facts and figures, that building with brick is as cheap as building with any other good material. To do this the brickmaker must post himself well as to the proper use and laying of brick. We never hear of brickmakers taking any interest in the planning of a brick house or in laying the brick. He simply wants to sell his brick. He takes it for a fact that brick is considered an expensive build-

layers, as well as to the public at large. I would say to all brickmakers: Don't try to make more brick than your market needs. Don't increase the capacity of your plant in order to sell brick cheap or to run out competition. It is much better to



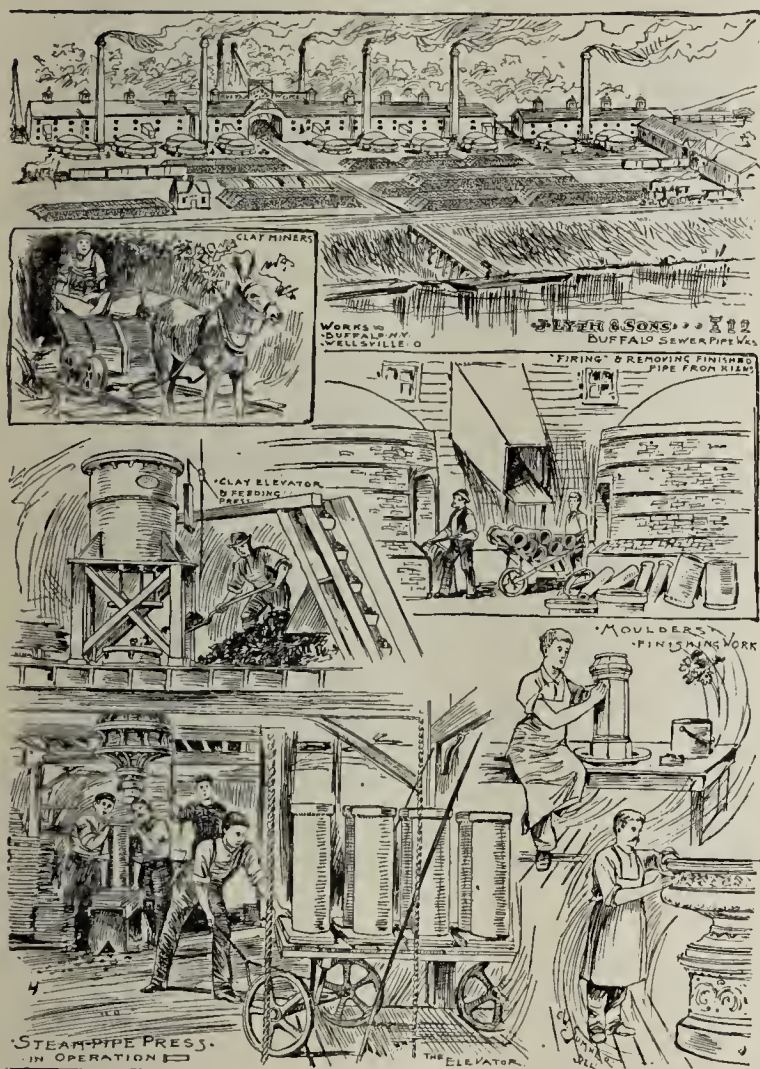
ALFRED LYTH, Buffalo.

make 5,000,000 brick at a profit of \$1 per thousand than to make 10,000,000 at a profit of 50 cents per thousand. Ten brickmakers, making 5,000,000 brick per year each, is nine times better for the community than one brickmaker making 50,000,000 per year.

Don't put the price of brick down, thinking that a low price will induce a greater demand. It is a great mistake to suppose you can influence more building by selling your brick at a losing price. A capitalist don't stand idle, when he wants to build, because you want a fair price for your brick. If there is no demand for houses investors will not build, if you were to give them your brick. Always keep your brick at a steady, good-paying price, and let your output be regulated by the demand.

Insist upon the best and most economical brick work. Talk to your architects, your builders and investors. Tell them that a nine-inch wall of good hard brick, properly laid in mortar in correct proportions of good lime, sand and cement, is better and stronger than a thirteen-inch wall put up in the common way; besides, four inches of room is saved in width of building. Talk to your bricklayers, and tell them to use the best kind of mortar. "Bed" the brick well; don't lay them hot or dry, but a little wet, so that after the mortar is well "set" the wall will be as strong as a stone.

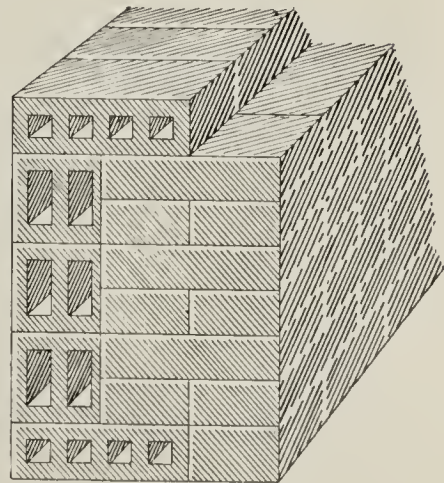
Talk to all who want to build, either in town or country, and show them that a good brick house is the cheapest, safest, and,



IN AND ABOUT SEWER PIPE WORKS OF JOHN LYTH & SON.

ing material and that no one would ever use brick unless compelled to do it, and, of course, the more brick it takes to do the job the better for the brickmaker. If a nine-inch wall, well built, would do just as well or better than a thirteen-inch wall, as built in the common way, the brickmaker will not say a word in favor of the nine-inch wall, because that would talk against the market for his brick, so he thinks. The bricklayer will act in the same way, because he generally lays brick at a certain price per thousand, counted in the wall, and he can do better by building thick walls than by building thin walls, so both brickmaker and bricklayer neglect to pursue the wiser policy of trying to show that brick buildings are, in all respects, better than any other kind.

I have given facts and figures in former writings on this subject. It is one of leading importance to brickmakers and



MANNER OF LAYING HOLLOW BRICK.

in all respects, the best. Forty-five thousand brick will build a one-story house, with cellar and five good rooms above, and, if the house is well planned and the walls well built, it will stand a common cyclone and last forever.

Talk brick building to everybody and on all proper occasions. Tell them that the people of the United States pay at least \$300,000,000 annually for fire insurance, and that more than half of this vast expense would be saved by good brick building in the country as well as city.

Your plan to get up a little book showing the advantage and economy of brick building over any other kind, and sending the book free to all the architects and builders in your section of country, is a good one.

The N. B. M. A., at its next meeting, might do something of the same kind, with much profit to the craft and interest to the whole country. Let it appoint a committee to report this matter to the next meeting, and then let the Clay-Worker get up the report in proper form and send it to all the architects and builders in the United States and to such other persons as would likely be interested. Indeed, I think the next meeting of the N. B. M. A. would do well to act at once on this subject. Let it send out a circular to all architects and builders, showing the advantages of brick building over all other kinds. I am willing to pay my share of the expense.

TRANSMISSION OF POWER FROM NIAGARA FALLS TO BUFFALO COMPLETED.

IMMEDIATELY AFTER MIDNIGHT, in the early hours of Monday, Nov. 16, the Niagara Falls Power Company made its first transmission of electric power from Niagara to Buffalo, when a current of 1,000-horse-power was delivered at the station of the Buffalo Railway Company. The occasion is notable as being the first practical example of the much-talked-of "harnessing of Niagara" for transmission of its mighty water power to a distance. Upon the commercial success of the Buffalo venture will depend the more extensive transmission of this vast storehouse of natural energy to the various manufacturing centers that lie at a greater distance. It was on March 31, 1886, that the Niagara Falls Power Company was incorporated. The construction company was organized in 1889, and work was begun on Oct. 4 of the following year. It took three years to build the tunnel, the surface canal and the first wheel pits. The canal, 250 feet wide, with an average depth of twelve feet, draws off sufficient water from the Niagara river, a mile and a quarter above the Falls, to serve for the development of 100,000-horse-power. The walls of the canal are pierced at intervals with ten inlets for the delivery of water to the wheel pit in the power house, which stands at the side of the canal. The pit is 178 feet deep and connects by a lateral tunnel with the main tunnel, which acts as a tail race and delivers the water back to the river below the falls. The tunnel, which has a maximum height of twenty-one feet and width of eighteen feet ten inches, was a large undertaking, involving the labor for over three years of one thousand men, the excavation of over 300,000 tons of rock and the use of 16,000,000 bricks for lining.

In view of the unprecedented nature of the undertaking, it was decided to throw the matter of designing the electrical plant open to international competition, and two prizes were offered "for the most efficient method of converting falling water into rotary motion and of transmitting the rotary motion or power to a greater or less distance." The turbines were built after the accepted designs of Messrs. Faesch & Piccard, of Geneva, Switzerland. They work under a head of 140 feet and each develops five thousand horse power. After a careful investigation of the power transmission plants of the world, the International Niagara Commission adopted a two-phase alternating electric generator of five thousand horse power, developing about two thousand volts. The first installation consists of three generators, designed by the company's electrical engineer, Prof. George Forbes, of

London, and built by the Westinghouse Company. The weight of each generator is 170,000 pounds. A fully illustrated description of this plant appeared in our issue of Jan. 25 of this year.

The first distribution of power was made to the works of the Pittsburg Reduction Company, adjacent to the canal, in August, 1895. Other and later users of the power have been the Carborundum Company, the Calcium Company, the Buffalo & Niagara Railway Company and the Niagara Falls Electric Lighting Company.

In December, 1895, the city of Buffalo granted a franchise to the company to supply power to that city, under the terms of which it must be prepared to furnish ten thousand horse power to consumers by June 1, 1896, and ten thousand additional horse power in each successive year. The first customer under this arrangement was the Buffalo Railway Company, which arranged to take one thousand horse power, at a rate of \$36 per horse power per year. The current is transmitted by a pole line, consisting of three continuous cables of unusu-



THE WHEEL PIT OF THE NIAGARA FALLS POWER CO., WIDTH 20 FEET, DEPTH 180 FEET.

lated copper, the total length of which is seventy-eight miles.

To meet the future demand, the Niagara Falls Power Company is preparing to install seven more generators of five thousand horse power each, which will be exactly similar to those already in place. When the necessary extensions have been made, the pit will be 430 feet long and 185 feet deep, and the total capacity of the plant will be fifty thousand horse power, or one-half of the capacity of the canal.—Scientific American.

TOO MUCH OF A GOOD THING.

Inclosed please find draft for \$2 in payment for the Clay-Worker for 1897. Money matters are very close here in Iowa, but we cannot get along without the Clay-Worker, even if we have to pay in advance.

How is the market at present in Indiana on confidence? We are overstocked with it here, so much so that it is a drug on the market.

Wishing you a happy and prosperous New Year, we are,
FORT DODGE CLAY WORKS.

Written for the Clay-Worker.

MARKET VALUE OF FIRE CLAYS.

IT IS INTERESTING to note the prices charged as royalties on fire clay in different localities in this country. An exact idea cannot be given as to the comparative cost, because the value is determined in some instances by the expense required in obtaining the clay; in other cases the expense of transportation to the factory is considered, and in others the distance of the factories from the markets is the important consideration. But clay properties do have a very great value. Where the deposits are of any extent and purity the price demanded per acre is from \$100 to \$1,000, and there are some properties that cannot be bought at any price. There seems to be a disposition to take up every clay property as it comes into market, and some people in the future are destined to be multimillionaires because of their foresight in gaining control of these valuable properties at practically no cost, and perhaps in the future we will hear the policy of protection condemned by unthinking demagogues because of the wealth thus secured.

The national government or the several States ought to publish, in cheap and convenient form, brief descriptions of these minerals and their values, if possible, and distribute them to every land owner, and such publications could be made to interest people and induce them to explore and prove deposits on their own lands. Through some such inducement the very best clays will be brought into market, and fire clay products not now manufactured or made only in limited quantities will be made in large quantities, and be not only a source of greater profits to capital, but also of increased employment to labor.

The greatest variation in royalties is in the New Jersey region. The best clays easily command 50 cents per ton, and they grade down from this figure to as low as 5 cents per ton.

In the Clearfield, Pa., region (this includes all the mines of the hard rock clay) royalties vary from 25 cents to 5 cents per ton. The same figures exist in the Mount Savage region. In northern Kentucky the royalties are about one-half those obtained in Pennsylvania and Maryland, although the clays analyze equal in all respects. In the soft clay and shale deposits along the Ohio river the rate varies from 10 cents to 4 cents per ton.

NOVICE.

OBITUARY.

Death of William C. Bush, Nashville, Tenn.

Very many of our readers will learn of the death of Wm. C. Bush, which occurred at his home in Nashville, Dec. 31, with profound regret. The deceased was stricken with hemorrhage of the brain last April, from which he never recovered. He grew better for a time under the skillful treatment of the best physicians, but for the last few weeks he had been failing rapidly, and his death was not unexpected. Mr. Bush was forty years of age, and was a member of the well-known firm of W. C. Bush & Co., brick manufacturers. He leaves a wife and seven children. He was an energetic business man, and stood high in the estimation of the commercial men of Nashville. He was the possessor of a genial disposition, which won for him many friends, who extend their sympathy to the bereaved family. The character of the deceased shone more brightly in his home life. He was a devoted son, a loving husband and kind father. An ardent, progressive brickmaker, he has for years been an enthusiastic member of the National Brick Manufacturers' Association, from whose councils he will be sadly missed.

THE COST OF CHEAP, COMBUSTIBLE BUILDINGS.

A few figures bring out with striking distinctness the vast cost to this country of its system of running up buildings that are easily burned down. Paris, with a population of 2,447,957, had 1,104 fires in 1894, with a loss of \$1,083,672. In New York, whose population is 1,801,739, the number of fires in the same year was 4,075, causing a loss of \$4,208,553. The total cost of the Paris fire department in 1894 was \$521,729 and that of New York \$2,268,742. Eight lives were lost at fires in Paris and twenty at fires in New York. The indirect loss by interruption to business and heavy premiums is not stated, but the same proportion will hold good. Fires cost New York at least \$8,000,000 or \$10,000,000 more a year than Paris. It is an item of tremendous waste, but the American people are giving it scarcely a serious thought.—St. Louis Globe-Democrat.

AN EXCEPTIONAL CASE.

Publishers Clay-Worker:

Inclosed please find money order for \$2 to pay subscription to the Clay-Worker for the year 1897. Although I am doing but a one-horse business and do not expect to keep up with the procession, I expect to take the Clay-Worker and so keep posted as to where the procession is.

I am satisfied with the past year's work, which was somewhat better than in 1895, both in quantity sold and prices realized for same. H. HEFNER.

Clarion County, Pennsylvania.

Mention the CLAY-WORKER,
When writing to Advertisers.
Mention the CLAY-WORKER,

THE VOICE OF EXPERIENCE.

For 12 Years the Clay-Worker has Filled Every Requirement.

P. L. SIMPSON, PRES.

WM. SIMPSON, VICE-PRES.



Messrs. T. A. Randall & Co.,

Indianapolis, Ind.

Gentlemen:--We cannot too strongly emphasize our belief in the beneficial influence of your paper in advancing the interests of the clay working industries.

It is now 12 years since we began advertising in your paper and we have never missed an issue since. We believe we are the oldest advertisers in our own specialty you have in your paper, and whatever measure of success we may have attained, aside from the "hustling" which is coincident with any successful business, has been largely due to the publicity given our machinery through the medium of the "Clay-Worker." We cannot say more than this.

In further answer to your inquiry regarding trade, will state that leaving out 1892 which was the banner year in all industries, we have done more business this year than in any other since our organization.

Wishing you abundant success and a continuance of public approval, we are,

Yours truly,

THE SIMPSON BRICK PRESS CO.,

P. L. Simpson, Pres.

Dis. by P. L. S.



OFFICIAL ANNOUNCEMENT.

Eleventh Annual Convention of the National Brick Manufacturers' Association to be Held in Buffalo, N. Y., February 2, 3, 4 and 5, 1897.

To Members of the N. B. M. A.:

THE ELEVENTH ANNUAL CONVENTION of the National Brick Manufacturers' Association will be held in Buffalo, N. Y., the first week in February, beginning Tuesday, the 2d. Buffalo's central location, unexcelled railroad facilities and excellent hotels make it pre-eminent among convention cities. This, coupled with the fact that it is but an hour's ride from Buffalo to Niagara Falls, the greatest of America's natural wonders, which presents a more beautiful appearance in midwinter than at any other season, will make the Electric City, as newly christened, a most desirable place of meeting for our entire membership.

Headquarters during the week of the Convention will be at the new Tift House, where delegates and those accompanying them will be accommodated at the following special rates, on the American plan only: \$2.50 and \$3 a day for rooms without bath, and, with bath, \$3.50 to \$4 per person, according to the location of the room, two or more to a room. Those who will be accompanied by ladies, and others desiring special accommodations, are requested to advise the Manager of the Tift House of the date of their intended arrival and the rate they want to pay, in order that suitable rooms may be reserved.

—Convention and Exhibition Halls.—

The meetings will be held in the main hall of the Buffalo Builders' Exchange, which is but a little more than a block from the Tift House. Rooms have been secured in the same building for exhibition purposes, where those desiring can display specimen brick, printed matter or small models of machines, etc. Those desiring space are requested to advise the Secretary as to the character of exhibit and amount of floor space required.

—Reduced Railroad Rates—

Have been secured on the certificate plan; that is, delegates and those accompanying them, if they pay full fare going and take a certificate for same from the ticket agent, will be entitled to return tickets at one-third regular rate, making two-thirds rate for round trip. Those starting from small towns should make inquiry of local ticket agent a few days in advance to insure the receipt of proper certificate. Where same cannot be obtained, be sure to take a receipt for full fare paid, bearing stamp of agent, who should state that the receipt was given in lieu of certificate, he being out of blanks. Those coming from points west and northwest of Chicago are requested to use their own mileage to that city, and purchase regular ticket from Chicago to Buffalo, taking certificate. If ticket is purchased from points beyond Chicago to that city certificates should be taken at both points. THOSE DESIRING CERTIFICATES

SHOULD PRESENT THEMSELVES AT THE TICKET OFFICE AT LEAST THIRTY MINUTES BEFORE DEPARTURE OF TRAINS.

Membership Badge.—

Each member of the association will be presented with an appropriate souvenir badge.

Members accompanied by ladies are particularly requested to notify Mr. Geo. W. Carter, Chairman of Entertainment Committee.

—Programme.—

First session, Tuesday, 2:30 p. m., Feb. 2.

Prayer.

Enrollment of members and roll call.

President's Annual Address—R. B. Morrison, Rome, Ga.

Report of Treasurer—John W. Sibley, Coaldale, Ala.

Election and installation of officers.

Appointment of committees.

"The Old, Old Story," essay, by O. J. Swegles, Buffalo, N. Y.

Discussion, to be led by ———.

(Note.—No papers or essays not included on regular programme will be heard unless previously submitted to and approved by the Executive Committee. At the close of each essay or address the subject under consideration will be fully discussed.)

—Tuesday Evening, 8 O'clock.—

Informal reception at the Convention Hall, tendered by the Buffalo Builders' Exchange.

SECOND SESSION, WEDNESDAY, 9:30 A. M.

"Clay in Architecture" Henry R. Griffen, Phoenixville, Pa.



PORTION OF OFFICE—New Tift House.

"Difficult Problems in Brickmaking" Geo. C. Hicks, Boston, Mass.
 "Burning Brick" H. L. Boas, Reading, Pa.
 "Which Principle Is Better for Burning Common Brick, Up-Draft or Down-Draft?" Debate between R. B. Morrison and W. S. Purington.

—Questions for General Discussion.—

"Is it best to leave furnace door open when watersmoking or drying off a kiln of green brick?"

"Is it practical to set stock or pressed brick flat to avoid fire marks?"

"What Is the Best Construction of Walls for Down-Draft Kilns?"

"What Is the Best Arc of Circle for the Crown of an Oblong, Square, Down-Draft Kiln?"

"Under What Conditions Is the Tight Floor of a Down-Draft Kiln Better than the Perforated Floor, and Vice Versa?"

"What Is the Cause of Black Cores in a Red Brick Which Is of a Normal Color Outside?"

"What is the most effectual non-conductor of heat, as applied to the body or floor or trucks in tunnel kilns?"

THIRD SESSION, WEDNESDAY, 2:30 P. M.

- "The Clay Resources of New York".....Prof. Heinrich Reis, New York City.
 "Using Heat from Cooling Kilns for Drying Purposes".....Robert Lyle, Perth Amboy, N. J.
 "The N. B. M. A. as an Educator." Essay, by W. D. Richardson, Shawnee, O.

—Questions for General Discussion.—

- "Is It Most Profitable to Dry Brick Before or After They Are Set in the Kiln?"
 "Should a Brick Plant Be Constructed so as to Utilize Natural Heat for Drying During Summer Season?"
 "Is It Advisable to Combine the Manufacture of Roofing Tile and Brick? Can It Be Done Without Much Extra Expense?"
 "Can Whitewash Be Prevented from Coming on the Surface of a Green Brick by Varying Its Treatment in a Drying Tunnel?"
 "Is Efflorescence on a Brick Wall Ever Due to the Kind of Mortar Used?"
 "Which Process Is the Better for Drying High Grade Building Brick, Direct Heat or Radiated Heat?"
 "When, if Ever, Is the 'No Admittance' to Brick Works Advisable?"

FOURTH SESSION, THURSDAY, 9:30 A. M.

- "Brickmaking—Old and New"....Brian J. Duun, Bangor, Me.
 "Requirements of the Trade from a Practical Standpoint." Address, by F. H. S. Morrison, Richmond, Va.
 "Some of the Essentials to Success in Making and Marketing Paving Brick"....Geo. F. Cotton, Table Rock, Neb.

—Questions for General Debate.—

- "Is a Vitrified Brick Suitable for Building Purposes?"
 "What Must Brickmakers Do to Be Saved from Bankruptcy?"
 "Does It Pay to Use Fire Clay Mortar in Kiln Building?"
 "Where Can Paving Brick Be Sorted to the Best Advantage—in the Kiln or on the Yard?"
 "What Will Be the Effect Upon the Dry Press Process of the Increasing Demand for Face Brick Made by the Mud Process?"
 "What Is the Proper Way to Take a Fair Sample of Clay for Analysis or for Test?"
 "Capital Sunk in New Brick Plants—Can It Be Prevented?"

FIFTH SESSION, THURSDAY, 2:30 P. M.

- "Success of Business as Affected by Geographical Condi-

- tions and Lack of Mutual Understanding.....H. H. Fernald, Boston, Mass.
 "Brickyard Management".....Frauk Alsip, Chicago, Ill.
 Report of the Commission on "Standard Specifications and Methods of Testing Paving Brick".....By Prof. Edward Orton, Jr., Sec'y.

—Questions for General Debate.—

- "Are Brick Dwellings Cheaper in the Long Run than Frame Houses? How Can We Demonstrate the Fact to Home Builders Most Effectively?"
 "Does It Pay to Soak Clay Which Has Been Ground and Screened Before Pugging It, Where the Product Is Stiff Mud Brick?"
 Reports of committees.
 Miscellaneous business.

—Friday.—

There will be an excursion to Niagara Falls, rain or shine. A special train will be provided, and the various points of interest will be visited, under the guidance of the Buffalo brick manufacturers.

Brickmakers of the United States and Canada are all cordially invited to attend the Convention and participate in the good work. Those desiring information relative to requisite of membership, etc., are requested to address the Secretary at Indianapolis.

THE EXECUTIVE COMMITTEE.

T. A. RANDALL, Sec'y. R. B. MORRISON, Pres.

PROSPERITY IN JERSEY.

Publishers Clay-Worker:

Inclosed please find remittance for your valuable paper, and must say that it contains in every number articles which are of much interest, and would not like to be without it. Clay business in these parts seems to be much improved since the election of McKinley, and collections come in more freely, followed with liberal orders, especially so from the manufacturers of terra cotta and buff front brick, which for the past year has been the greater part of our business. The terra cotta manufacturers in this vicinity seem to be running full time, and are very much encouraged with the prospects for another year.

Metuchen, N. J., Dec. 24. AUGUSTINE CAMPBELL.



A GRAND VIEW OF NIAGARA FALLS IN MIDWINTER.

THE NEW YORK MARKET.

In the books of the brick manufacturer there will be but few more debit and credit entries for 1896. Before the next Clay-Worker reaches the subscriber the majority of the men engaged in the brick trade will have struck a balance as regards the profit and loss of the past season.

As one reads between the lines of the different communications which have appeared in your journal from time to time it is as plain as daylight that the scale of low rates—if not rates which do not return cost—prevail quite generally throughout the country. In many cases it has been running the yards to wear out the machinery, instead of letting it rust out—which would have paid better for the year 1896, at least.

It goes hard for men in business to say there is a loss in manufacture, and they will take refuge behind the saying that there is no money in it, creating the impression that cost has been reached, but no margin of gain. Apply the same argument to trade as one would to a sick person—where there is no perceptible gain there is a loss.

Has the manufacturer of brick reached the stage of producing no more than a living? As a money maker is it a thing of the past?

During election time the stereopticon is used to flash many pertinent facts on canvas, so that those who run may read. If such a thing were possible that some one could flash over each plant in the States these words, "Does the purchase mortgage still remain on this plant?" "Has it been reduced, or has it been increased?" "Is there any mortgage on the plant?" and a truthful reply of the condition from the owner appear from the same instrument, it would show to the business world a financial condition that many are not aware exists in a manufacturing trade which is considered one of the money making institutions of the country.

When, through force of circumstances, there is a failure, it is very generally talked about, as the community in which it occurs looks upon the brickmaker as one who is always making money. To hear some of them talk about how cheap they can make brick it should be but a few years before they are millionaires. Is there a millionaire brickmaker, the money made in the manufacture of brick?

One of our "has been" leading manufacturers said in a public place in town some few years ago that he could make and place brick on the New York market for \$3 per thousand, and was getting \$7 per thousand for them. Is it any wonder that people of the town were surprised, a few years later, when the "bubble was picked" to the tune of \$200,000 or more?

The tide water men admit that there is an overproduction, but do not seem as individuals to want to make less than their capacity unless all join. To judge from your journal, some claim that it is not that which troubles the trade, but reduced consumption. Well, that looks as if it were a case of trying to fill a square hole with a round peg. The stock has to try and find a market, and the buyer is going to take advantage of the other fellow every time.

Like conditions do not exist all over the States as regards the number to be made. If the experience of the past two or three years would be a benefit in the future to those who make on lease or agree to make a quantity that they could handle, it would, in this section, be a great deal of money in the pockets during a five years' lease.

—A Five Years' Lease,—

With the privilege of renewal, is the custom on the Hudson. How many who are making brick for the New York market who to-day are about on their last year of the first five, or on the extension of the second, who are not richer in experience—but reduced in pocket? I question whether there has been in the brick trade a continuous five years of good profits. If at the start the returns were of good size, before the expiration of the lease they were so small, if any, that the manufacturer found, when he had disposed of all his old stuff, he had more money when he started than after five years of hard work. Case after case could be quoted where, by their own confession, the brickmakers held on too long. "Why did I re-lease?" he says. "If I had quit when my lease was out I would have been all right."

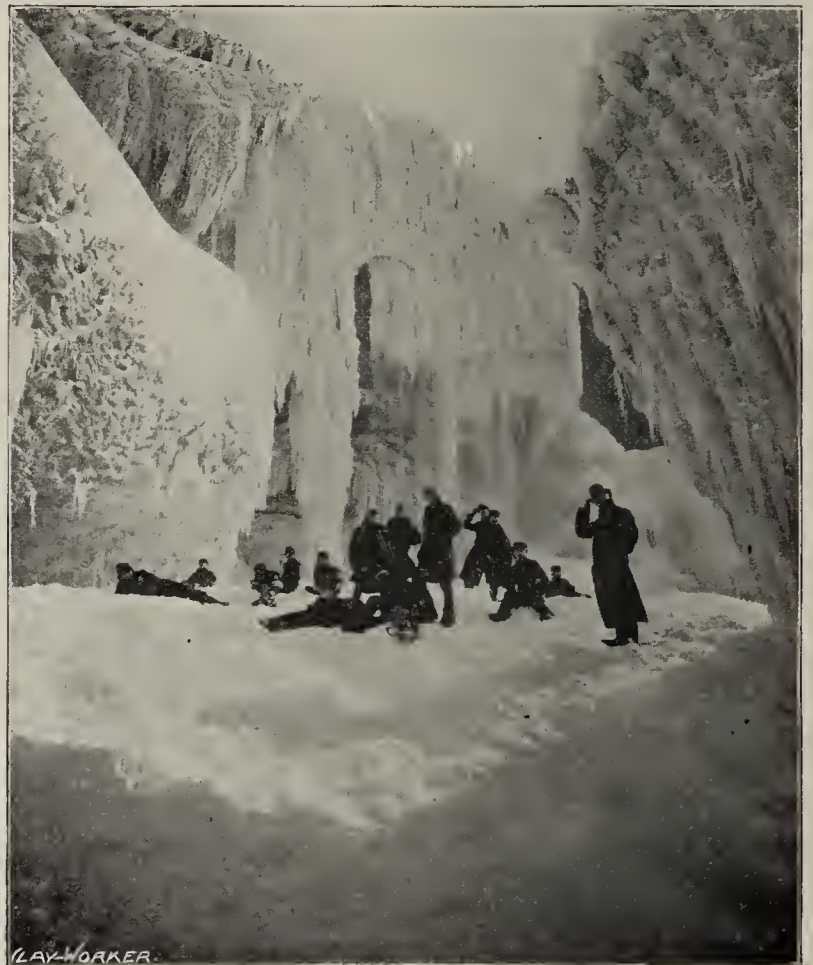
The old saying that "what a man is worth is not known until he dies" is quite true. As one looks back and up to within the past two years, the death of the brick manufacturer has been a surprise to many in the small estate he has left, and in some cases none.

The brick trade of Passaic and Bergen counties will be

thankful if Gilbert Bogert and Richard Morrell will be able to raise the price of brick to the figures quoted—\$6.50 and \$7—as their chief market is reached, by both water and the same railroad as their plant is on, by the Hackensack brick. The past fall one of the gentlemen came to Hackensack to purchase brick and told the manufacturers here he could get brick delivered on the cars at Passaic for \$4.50 per thousand, quite a margin between the two rates. In the same county there was a yard much on the same principle. Well, this open, trappy yard is still turning out brick, and will continue, while others of the finest equipments may become monuments to the loss of capital.

—The Market.—

There comes a time when the dealers have enough to supply all wants, and about the holidays is the time, especially as at present writing winter weather is in order. Zero weather and below is what we are enjoying, which affects the consumption of brick. There may be a few more barges reach the market, but it is uncertain. The last lot from Haverstraw was to go under cover for higher rates. The Hackensack is closed. There is one barge from here which has been at the dock to discharge cargo for a week, and has only 30,000 off, which



A COOL PLACE TO REST AT NIAGARA FALLS.

looks like the middle of January will be reached before she is unloaded. Lots of money in this trip.

I do not know whether the manufacturers enjoyed a merry Christmas or not. The market for brick was of a nature to make one feel far from merry. Probably there is not in the records of the trade for any year before that brick sold for so little at the close of navigation. The year 1896 will not go out in a blaze of glory for rates. Last spring, before the Hudson was open to Haverstraw, the rates were \$6 per thousand and over. The second tow from that place dropped them down below that figure.

Last year at this time a thousand brick would, after freight and commission were taken out, leave as much as they will now bring.

1895.		1896.
\$2.00 @2.50.....	Pale	\$1.50 @2.00
None.....	New Jersey ordinary.....	4.00 @4.12½
5.25 @5.75	New Jersey good.....	4.25
5.25 @5.37½.....	Common hand ordinary.....	3.75 @4.12½
5.50	Common good.....	4.12½@4.50
5.62½@5.75	Common fine.....	4.62½@4.75
5.87½@6.00	Choice	5.00

What will the harvest be?

A. N. OLDTIMER.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Tribulations Incident to Making Stiff Clay Brick From Indiana Surface Clay.

Editor Clay-Worker:

I have an impulse to write you my experience in regard to the proper preparation of clays for the manufacture of stiff mud brick (so called), and if you believe in the divinity of impulses, listen to me. I have read a great many good articles in the Clay-Worker on the subject, but I think nothing seems to give sufficient emphasis to this supreme and vital point. Tell my brothers of the craft they might as well expect to make good lumber from bad timber as to expect good brick from illy-prepared clay, however good that clay may be in itself, and I insist that the difference between right and wrong, in this case, is as broad as that between vice and virtue, or between mother love and mother-in-law love.

I well remember, three years ago, when I bought the Little Wonder, how Mr. Cunningham warned me to see to it that the clay was just right before it reached the mill. Well, while I did not mean to disregard his warning, it seemed to go into one ear and come out the other. Now, if he had only plugged that other ear, how much sleep, service and silver it would have saved me! But alas! I fear I am one of the number who seldom see the point until they have been stuck by it. But now for the experience.

I hauled up a lot of clay, some wet and some dry, some rich and some poor, but I depended on the average being about right, and we made brick, fast! and, of course, I assumed a serene smile of self-satisfaction and plumed myself on my grit and grip, on the new feature of the tile business. Then I began to have visions of big orders from big bankers, from big cities, for arsenals, aqueducts and auditoriums! But, alas! I noticed my precious brick were cracking badly wherever they were exposed to the least draft. Of course, this was a very unwelcome discovery, and I banked up around the shed, and then I fairly clamored for causes, and when the draft was shut off I found my brick were not drying fast enough! Yet when I admitted the least air they seemed to open great gaps, like a slit in a pie, and literally make mouths at me. But finally, as they became drier, those cruel mouths seemed to close up, and I devoutly hoped they had the everlasting lockjaw. But when I came to fill the first kiln! Behold the bats! bats! bushels of bats! Barrows and barrels and boat loads of bats!

And talk about your Gettysburgs

And your bloody Waterloos!

And talk about your blasted hopes!

And talk about your blues!!!

It seemed to me I was irrevocably ruined. I felt like putting up notice like this on the old shed:

In God I trusted,

But in fact I busted!

And then came the depressing duty of hauling off bats to be retempered, remolded, rehandled, and, perhaps, re-rejected. And so the first summer passed, full of sweat and severity, and unsolicited lessons, and unsalable brick! And I got awfully tired of sending out a wagon load of apologies for every cart load of brick.

But that winter I had time to rest and reflect, and the next spring Old Glory seemed to brighten everything up, as usual, so I started out with more care and less conceit. First, I hauled water to the field and soaked the clay several days in advance of the shovelers. Then I was very much more careful to mix the clays equally, and when the dry weather came I covered clay ground with a liberal coat of straw; then, with plenty of water, the clay was kept in perfect condition, and my troubles in that respect, at least, were over, for I have been making sound and satisfactory brick ever since. And, as Pope well says:

"The greatest virtue is vices to abhor;

The greatest wisdom is to be a fool no more."

Hoping sincerely my severe experience may cast a little light on some troubled brother's pathway, and with kindest wishes for a happy and prosperous New Year for you all, I am respectfully yours,

M. C. MEIGS.

"So teach us to number our days that we may apply our hearts unto wisdom."

Gate's \$900 Tip.

Editor Clay-Worker:

"When I read about the nine-hundred-dollar package I knew it was our Gates."

The above, emanating from our only Morrison, and turned loose by the Clay-Worker, traveled way down to the gulf, where I had gone to acquaint my anatomy with the oyster and fish, with the piny breeze and yam, and try to recuperate before the Convention. Now, I like sarcasm, and I mistrusted that Morrison had some, but I never imagined that he would deal it out in such large doses. The idea of my having all that money at once, and then the utter absurdity of my unclenching my fist for a moment if I did have it! It's like Purington's story of the man and the brick machine: "If I had that much money, what in Humpty Dumpty would I want of the clay business?"

Now, if I do not attend the Convention at all it will be Morrison's fault. How could I look a waiter in the face after having been thus advertised? What am I to say to all the fellows who will come to borrow money of me? And, even worse still, what can I say to the fellows I go to borrow money of? Then just notice how coldly he says, "We will give Gates a chance to explain at Buffalo." I don't want any chance. I don't want to explain. I don't want my trip ruined. If I go to Buffalo it will be to have a large-sized time with my brother clayworkers in trading off a few second-hand last year's ideas for some brand new this season's ones, and not to explain the actions of other Gateses. Because the President of a great steel company, who travels in a private car and carries large packages of assorted money, happens to be my namesake, and is doing what I know and feel I really ought to be doing, but cannot because I am not in a line of business that has that kind of trimmings, this is no reason that the distinguished citizen of Rome should get so blamed sarcastic. In order to avoid all mistakes, however, I will state clearly right here that the waiter who looks under the chair of this Gates for \$900 will not be successful, and any friend of mine who escapes without staking me for the return trip can congratulate himself.

I really don't like to find fault with Morrison, because I like him and have always admired his taste. He is one of the best men to select a hat that I ever knew, but when he hurls a great chunk of sarcasm to hit me with a dull, sickening thud when I am resting and unsuspecting, naturally it excites me. It is possible I may attend the Convention, even after suffering this, for it is very hard for me to keep away, but if I do it will not be for the purpose of making explanations, but I shall simply unload the cares of the office upon some one else, pack my small and hungry grip and get on board the train, humming that old, familiar hymn, "Put me off at Buffalo." GATES.

Drying Brick by Waste Heat of Kiln.

Editor Clay-Worker:

In reading your last issue I find a communication from a Mr. R. W. Lyle, who got that "tired feeling" through reading an article headed "Drying Brick by Waste Heat of Kiln," which I wrote for your October number.

He also states he is no "student of ceramics." Well, I believe that, for if he were he would have comprehended fully the uncomplicated theories that I advanced in the article, which I find, upon receipt of letters, very many brickmakers did.

If this system is not patentable, as he claims (but he may be fooled), why did he not give the brickmakers years ago his knowledge on the subject, and thus save thousands of tons of fuel for the country and dollars for the brickmakers? I thought that everybody knew that china ware could not be dried by this system, so therefore I did not mention the clay articles that could. I will not go into details by criticising his letter, as I would have to write a volume and analyze it in order to have Mr. Lyle fully understand the few brief theories advanced.

First—He says the waste heat only can be utilized to advantage.

Answer—By knowing how to do it.

Second—In his experience the drying by the heat of kiln causes the brick to burn pale.

Then his experience in that direction was not very successful, for it can be done without coloring them. He also says

"the system is without much merit if much heat is drawn, except as it passes out of the stack or after the kiln is finished and heat drawn from crown." That goes to show that Mr. Lyle does not know the proper time to draw the heat from the kiln.

Third—"It is impossible to burn a kiln quicker."

Undoubtedly; his not being a student proves it, or his practical experience has not been very wide in this direction. We can burn them off from ten to fifteen hours quicker.

Fourth—He never discovered the consumption of coal to be less, because he is not even practical. We can save some fuel.

Fifth—I was not writing about the whole kiln being affected or benefited. I claim that the crown was benefited. Probably students only observe.

He would advise no one to put in such a system unless they have kilns enough to draw sufficient waste heat from. I think that is a practical idea. He also claims that this subject has received little or no attention in the past. Why? I think it is useless to go on and argue such small questions as building kilns in rows and keeping smoke out of drier by dampers, etc.

CARL GIESSEN.

Gathering and Storing Clay for Dry Press Process.

Editor Clay-Worker:

Preparing clay for the manufacture of dry press brick is one of the most difficult problems that confront the manager of any dry press plant manufacturing red brick. In order to make a good quality of brick, with the smallest amount of repairs and lost time for machinery, the clay must be in a condition near perfection in quality and temper. If the clay is taken direct from a field, too much care cannot be exercised in getting it ready for storage. The way we have found the most successful is to strip all sod and loam from the field to be used; then plow one way to a depth of four or five inches, then cross-plow about seven inches deep. The result is you get the clay well broken and well mixed on the field. When the clay has dried out sufficiently, commence to store it in the sheds, starting at one end and filling to the height required. Make the grade on the filling side just as steep as can be hauled up. Have the shed men make every course of filling just as even as possible from side to side, and have them keep the top well rounded up, leaving no depression to hold snow or water from roof. We have better success storing clay in September than in any other month. One thing to avoid in gathering clay for lever press machines is getting it too dry. Clay that is too dry is just as hard on machinery as extremely wet clay. We always try to get our clay in such temper that there will be about eight ounces of moisture loss to each brick after they are dried and ready for burning.

The cheapest and best way to store clay is by contract, unless you have a number of teams in connection with the factory. Have your field surveyed before you commence to strip sod, and, after the clay has been gathered, then you can tell how many cubic yards of earth have been removed.

In taking clay from sheds to disintegrator the loaders should be careful and keep the front of the bank trimmed straight across the shed, avoiding any unnecessary work in rehandling the clay.

COMPRESS.

Down in Jersey.

Editor Clay-Worker:

For the past two months or more your Jersey correspondent has been located in New Castle, an ancient city on the historic Delaware, punching holes in Mother Earth for that exceedingly useful article—water. Hence my facilities for inquiring about the brick industry in my home district of New Jersey have been slight. But a recent trip up there gave me some chance to inquire how things were moving. We found all the hollow brick works running full time again, with the exception of the Spa Springs or Staten Island Terra Cotta Lumber Company's plant. At this plant, we understand, a small force is at work, and there seems to be an impression that a new regime will take effect there early this year.

The Ostrander Fire Brick Company are running night and day to keep up with their orders. This is one of the old stand-bys. The Valentines are also running both of their factories full time, but this old firm very seldom cuts off any of its help, running the year around on stock.

The C. Pardee works are making large quantities of hollow brick, as are also the Standard Fire-proofing Company, now under the management of Mr. Robert Lyle. The latter gentle-

man met with a slight loss by fire destroying one of his cottages in Perth Amboy last week. As the painter who was giving the row of cottages a coat of fresh paint had only finished this one about one hour before it caught fire, no doubt the fresh paint helped to brighten up the flames and make them burn more fiercely.

At the Keasby factory a new electric light plant has been placed in order to facilitate work. This has been a long contemplated improvement with this firm. This company is also putting out large quantities of hollow brick.

The terra cotta works are all moving. The Perth Amboy Terra Cotta Company is still running with a small force.

E. Mathies & Co., formerly of Trenton, N. J., have taken a lease of the Enameled Brick Works at Matawan, N. J., and have moved their plant to that town. These men are graduates of the Perth Amboy Terra Cotta Works. Their new place gives them more kiln room, which they did not feel justified in building in the leased works at Trenton, hence their removal to Matawan.

The demand for red brick has now fallen off for the season. We have not learned as yet how many houses have been erected in Amboy this season, but think fully as many as in 1895.

Here in Delaware we find Mr. L. H. Lupton runs the only brickyard in this city. This being his first season here, he tells me he cannot complain. He has recently completed his contract to furnish 250,000 for the power house of the Wilmington & New Castle Electric Railroad. Mr. Lupton has a plant capable of turning out 30,000 per day, using a New Haven machine. As his yard is only arranged to dry brick by the rack system, of course he is closed down now for the season. The brick made down this way are so much redder in color than the Jersey brick that it reminds us forcibly of our native heath.

We notice some very quaint old buildings here in this city, all of red brick, no doubt some of which were imported. It is said that Wm. Penn first landed here on the ground upon which this city of New Castle stands, and originally intended to call this place Philadelphia, but later went on up the river. Quite a large sum is realized each year by the city from farms owned by the city, given by Wm. Penn for the benefit of the future generation, which he no doubt saw was destined to settle here.

We notice many improvements in Philadelphia, Pa., during our trips back and forth. Vast numbers of tenements are being erected in the suburbs of the City of Brotherly Love, but her business buildings cannot as yet come up to New York for grand and lofty heights.

We note some very peculiar customs here in this State. It is a capital crime to commit murder, arson after 9 p. m. or rape at any time. The colored race is well represented here, and they do say that during election times, if one is a candidate for an office, he can buy all the votes he may wish at the fabulous price of one glass of whisky up to 50 cents in silver or gold, as either kind of metal is good now. The only difficulty one would have in paying in gold would be to split the dollar in halves.

A couple of colored chaps who have been sentenced to jail for life (there being no penitentiary in this State) are running at large upon the streets here. We find the people, as a rule, very hospitable. We had a very kind invitation last evening, by one of the Jail Commissioners, to witness the execution of the murderer, Wright, who shot his sweetheart to death in the city of Wilmington, last July, but we drew the line, fearing the sight would be too much for our weak constitution. The new year was commenced by the hanging of Wright at 10 a. m. to-day. So you see we are right in it as far as "a pull" of this kind goes.

We believe that 1897 will be much better for business than was 1896, although we cannot complain.

Thank you for your kindly wishes, and I take this opportunity to return same, and wish you many returns.

No doubt the brethren will have a very nice time in Buffalo, as it is quite a city. Shall try to take up my sketches of works at Amboy in near future.

W. R. O.

The Situation at Chicago.

Editor Clay-Worker:

The year 1896 was one of exceptional dullness, and those who, so far as business was concerned, are not glad that the year has passed away are the exception, and in a very large minority. Comparatively it was, I think, the worst year in building lines that Chicago has ever passed through. The total cost of buildings erected in 1896 was about \$22,500,000, while that of 1895 was over \$35,000,000, which shows a decrease of between \$12,000,000 and \$13,000,000, but this does not tell the whole story so far as clay interests are concerned. During the

year that has passed there has been a very large increase in the proportion of stone used in the fronts over that of preceding years, and a corresponding decrease in the amount of pressed brick and terra cotta. This increase may be largely attributed to the fact that there seems to be a conclusion arrived at by money lenders in the real estate market that a stone building is more valuable and a better seller than one constructed of brick. Of course, this position is wrong, but up to this date the real estate loan men do not seem to have changed their opinions. I will not at this time take up a discussion of the merits of the two materials, as all your readers are well posted on the subject.

Despite the general dullness in building operations during the past year there has been quite a good deal of construction in business blocks in the business centers. Among the most noteworthy of these structures in which clay products were used I will mention the Stewart Building, at State and Washington streets. The building takes its name from the owners of the real estate. It is a beautiful structure, twelve stories and basement high, and has cost upwards of \$600,000. It is erected after design by D. H. Burnham & Co., in the French renaissance style of architecture. The first story and basement will be occupied for retail business and the stories above for offices. The exterior of this building is constructed of glazed terra cotta for the basement and first and second stories, the same being of an olive green tint, and the stories above of unglazed terra cotta of a light cream color. The cornice and pilasters are very nicely finished, and the ornamentation is very pleasing.

The Trude Building, fronting one hundred feet on Wabash avenue and about half of that on Randolph street, is another imposing structure, eleven stories high, the cornice being over 150 feet above the sidewalk. This building was designed by Jerney & Mundie, and the exteriors on the two sides are faced with pressed brick and terra cotta, the first two stories being of glazed terra cotta of an olive green color. The structure will be used for stores, and also for manufacturing and storage purposes.

Another noteworthy structure is the Silversmith Building, on State street, just south of Madison street, which cost in the neighborhood of \$200,000. It is ten stories high, running up about 130 feet from the sidewalk. The front of this building is composed of red brick and terra cotta, and has a very creditable appearance.

Since the election, and since the beginning of the year more especially, the improvement in actual work started and prospective is very great, and the consensus of opinion among people interested certainly seems to be that the prospects for 1897 are exceedingly good, and it is believed by many that the record of the present year will come very near to, if not equaling, that of 1895. There is no doubt in my mind that the lowest point in construction has been reached, and that in the future operations will be on a more extensive scale.

In 1896 about 300,000,000 common brick were made in and about Chicago, which was probably about one-third the capacity of the works, nearly 200,000,000 less than in 1895. While the common-brick makers have had a very hard experience in disposing of their product, there have been no failures to record in this industry. During the existence of the Illinois Building Material Company prices were firm, but after the breaking up of that institution brick declined to \$4, and practically remained there during the balance of the season. At the present time common brick are selling at about \$4.50. It is supposed there were about 130,000,000 brick on hand on Jan. 1 of this year.

In the pressed brick market some grades of pressed brick have declined very much in price, in some instances as much as \$4 per thousand. This applies to the cheaper grades, but with the decline in prices the decrease in quantities sold was very much heavier. The decrease in 1896 over 1895 must be between eleven and twelve millions.

The failure of the National Bank of Illinois created quite a little excitement for twenty-four or forty-eight hours, until the exact condition of affairs became known to the public, since which time it has had practically no influence in financial and business circles here. It is not believed that the hard times had very much to do with the failure of this bank, it having been destroyed by ill-advised investments on the part of the bank managers, and such failures are as apt to take place in good times as bad.

Chicago will undoubtedly send its full delegation to Buffalo on Feb. 2, and all are looking forward to a pleasant and instructive session.

COSMOPOLITAN.

Chicago, Jan. 11, 1897.

PROF. ORTON'S PYROMETRIC CONES FOR MEASUREMENT OF TEMPERATURE IN KILNS.

We are indebted to Prof. Edward Orton, Director Clayworking Department of the Ohio State University, Columbus, for a trial set of pyrometric cones, which he is now making especially for clayworkers.

These cones, made after the system introduced in Germany by the late Dr. Seger, are the most convenient, most accurate and least expensive means for the measurement of high temperatures and for the conclusion of the delicate operation of firing off a kiln of clay wares. They are better than any real pyrometer, from the fact that they do not record degrees of temperature, but the results of temperature. Being made of clay and mineral ingredients only, they undergo similar chemical changes to those which clays undergo in burning, and their final fusion means not only that they have been heated to a high enough temperature, but also that that temperature has been maintained for a long enough time for vitrification or chemical combination to take place between the various minerals represented.

When exposed to heat under exactly similar conditions, they melt at almost exactly the same temperature each time, but their fusion may be made to vary several degrees by hastening or retarding the firing, and thus decreasing or increasing the length of their exposure to the action of heat. But when clays are similarly treated they behave in a similar manner, so that the cone is at all times and under all conditions a safe guide and relative measure of temperature for the clay industries.

The cones are neatly packed in boxes, each containing a complete set of twenty cones. A pamphlet fully setting forth the manner of using the cones is inclosed in each box. By following the printed instructions, which are both simple and brief, any burner may use the cones successfully and determine the exact temperature required to burn his clay, and by their use regulate the process of burning intelligently, and fire more by rule and less by guess.

The cones are made and standardized in the laboratory of the Department of Ceramics and Clayworking of the Ohio State University. They can be had there in all quantities at the standard and uniform price of one cent apiece, or one dollar a hundred, neatly packed in sawdust. Sent in small lots by mail on receipt of postage, at the rate of 4 cents per set of twenty. Lots of one hundred or more sent by express, collect. For further information address Prof. Edward Orton, Jr., Columbus, O.

BRICK AND TILE MANUFACTURERS ASSOCIATIONS.

The Illinois Clayworkers Association meets at Galesburg, Tuesday and Wednesday, January 19th and 20th. Full programme given on page 457, December CLAY-WORKER. Headquarters will be at Union Hotel.

The Nebraska Brick Manufacturers Association will meet at the Capital Hotel, Lincoln, Tuesday, Wednesday and Thursday, January 19th, 20th and 21st.

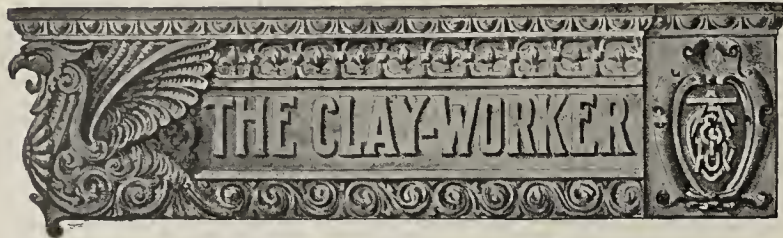
The Ohio Brick, Tile & Drainage Association will meet at Zanesville, Ohio, Tuesday and Wednesday, February 12th and 13th. See page 34 this issue.

The Iowa Brick and Tile Manufacturers will hold no Convention this Winter, it having been deemed best to defer the meeting for a year.

The National Brick Manufacturers' Association will hold its 11th Annual Convention at Buffalo, February 2-5. For full particulars, see pages 38 and 39.

A NEW CATALOGUE has just been received from the American Clayworking Machinery Company, Bucyrus, O. It contains cuts and descriptions of all the many machines and devices now made by that company, and as they number up in the hundreds it is consequently a very large book, so large, in fact—320 pages—that to go through it carefully would require several hours. It weighs nearly two pounds, and, being printed on the finest of coated paper, and containing hundreds of fine engravings, it represents a very large investment. Nevertheless, a copy can be had free of charge by any clayworker who will request it. Address the company direct, mentioning the Clay-Worker.

Our genial friend, J. Dixon Doyle, has severed his connection with Clay Record of which he has been editor since its first issue. Dixon's bright bon mots and rhythmic rhymes will be missed.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " " " " " "	10.00
Ten copies, " " " " " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVII.

JANUARY 1897.

No 1.

THE BUSINESS OUTLOOK FOR 1897.

It is always encouraging to hear the doctor say, "The patient is no worse this morning," where you have been watching him anxiously for many days, as he seemed to be slipping away, especially if he adds, "His symptoms are all decidedly better." Such is the condition of business to every one who will look beyond the narrow horizon of his own troubles. No thinking man expects business to bound at once from the low ebb it had reached to the high tide of five or six years ago; it is enough for the present that the tide is turning; the patient is no worse; symptoms are all decidedly better.

HARD TIMES—AN OLD MAN'S RECOLLECTIONS.

We have an octogenarian neighbor who occasionally interests us with his reminiscences. Speaking, the other day, about hard times, he said: "Hard times! I have never seen the day that some people were not complaining of hard times. They are born that way. I suppose that Adam complained of the times when he had to give up gardening and go to plain farming, and naturally enough he blamed the administration with it all. There is nothing new in the present condition of affairs. I remember as far back as the twenties. The man who pegged away then, content with the moderate proceeds of hard work in pioneer days, got along very well, raised his family to work, and they and their children have furnished the substantial business men and women of the later years, while those who wanted to grow rich in a trice and by some short way lost everything and saw hard times.

"Towards the close of the twenties the disasters of bank failures and the like, which were at their worst in the first part of the decade, had so far passed away that a wild spirit of speculation and extravagance in living took possession of the people everywhere. What was done in Indiana was duplicated in other States, and what was conspicuous in the State

as such was only a sequence of the spirit of the period as it existed in families.

"As a matter of speculation the State borrowed millions of dollars in the early thirties to build canals and railroads and turnpikes. Nearly five hundred miles of canals were projected and half as many miles of railroads and turnpikes, each. These were to bring a fortune to every man, and the output of a single hen was to pay the cost to the farmer, while his produce was to bring fabulous prices in the markets of the world. Not a mile of all these improvements was ever completed by the State; taxes were increased to pay the interest on the bonds; the works were abandoned, and the currency of the period proved worthless. Nearly everybody had gone in debt in anticipation of the coming fortune. The farmer could not pay the home merchant, the home merchant could not pay the Eastern merchant, and everybody was in distress. Of course, the blame was laid on the administration, and a political cyclone swept the Democratic party from power, when it was no more responsible for the condition of things than was the Sultan of Turkey. It was the mad spirit of speculation, going in debt and having nothing to pay with.

GOOD TIMES ALWAYS FOLLOW BAD.

"But when things got to their worst they began to mend. Debts had been canceled by the bankrupt court or forgiven because not collectible, and by the middle of the forties a wholesome spirit of prosperity began to prevail, but the spirit of speculation began to grow again. It took form largely in land speculation. Every spare dollar, and dollars borrowed at high interest on a mortgage on the home, was invested in Western lands or in town lots where no town was or ever could be; men built finer houses than they could pay for, or took stock in projected railroads, which, when finished, if ever, passed into the hands of the bondholders, by them to be handed over to receivers; or they organized free banks on worthless bonds to make money to lend to speculators. Of course, a day of settlement had to come. The result was that the later years of the fifties were a duplication of the later years of the thirties, as near as the material growth of twenty years would allow. Of course, too, the blame was laid on the administration, and again the Democratic party was defeated, the slavery question playing but a secondary part, and the party being remotely, if at all, responsible for the economic condition of affairs. As in the crisis of twenty years earlier, the blame lay at the door of fast living, wild speculation and a desire to grow rich in a short time.

"The war and its sequences, especially as to the currency, somewhat modified the methods of the next period. It is a fact not often emphasized that, while the spirit of patriotism was not lacking in the early volunteers, many accepted the life of a soldier largely because employment at \$13 a month was better than they could do at home in any available industry. But how few of the returned soldiers ever went back to the drudgery of the farm or the shop. They easily caught the spirit of speculation which war times had engendered, and went rather into agencies or offices or trading of some kind, especially in real estate, settling in towns or cities, looking for 'situations.' What became of all this? Let the bankruptcies of the middle seventies tell. Additions to towns and cities and town lots on paper could not be sold for 10 cents on the dollar of the cost; money lent on mortgages could not be recovered; laboring men who had been employed in building streets through cornfields had to be fed at soup houses. Talk of the destitutions of to-day! It is nothing compared with that of twenty years ago, and all because everybody expected to get rich at short notice by escaping the plodding methods of the fathers.

SLOW BUT SURE METHODS BEST.

"Now look at the situation to-day. We are passing through just the experience that I have been a personal witness of four times in my short life, and from the same cause, or causes,

every time—living too fast, going in debt, discounting the profits that never materialized, and thus losing money we never had. And who is to blame? Let him who is without sin in this matter cast as many stones as he pleases. I'll stand and take them all. But, you ask, is not this or that economic measure responsible? Nonsense. No economic measure has any responsibility beyond its responsibility for that spirit of unrest while it may foster that desire to get a little the best of every transaction; if not to get something for nothing, such as a fortune from some ancestors who left it in the Bank of England, where it awaits only a little investigation, then it is to get some big thing for a very little old-fashioned brow sweat. What strikes me is the approximate regularity with which high tide or low tide are reached—about every twenty years—hence I am, from the almanac, as sure the tide is beginning to curve in as I am that the days are getting longer. We can't notice the change much yet, for the nights are still long in cloudy weather, but a bright day shows a marked change, just as a bright spirit sees brighter days in the business world. We have all gotten down to bed rock in our expenditures, and we have about concluded to do without the money we can't collect, even if we don't forgive the debt. Congress need not pass that bankrupt law, for we are going to work hard and hopefully, keep out of debt, and buy nothing on speculation. A good time is coming.

"Do you ask what of the future? Why, of course, our children, as well as some of us older people, will conclude that this time the tide will always be our way, or that we will be sharp enough to unload before it begins to recede; but twenty years hence we may expect just about such a settlement of accounts as we have been experiencing for a year or two. Prudent old men will tell the boys to look out for an ebb, but young America will say, 'We are at the helm now,' and they will probably learn as little from the past as the present generation has learned from former collapses. Nevertheless, the tide is coming in now. Business is improving."

FOR PLEASURE AND FOR PROFIT.

So much has been said with respect to conventions and the good to be gained by attendance upon them, their educational and social benefits, that little or nothing can be said without repetition. Few can afford to stay away on account of hard times. The knowledge of how to make a better brick and cheaper brick than ever before is more necessary than ever. Competition is more severe with each year. It is not only important to make the brick as cheaply as possible, but business methods looking to restraints in competition are equally important. After one has made a brick which is of good quality, and has made it at a very low cost, he should know how to sell it at a relatively high price. Help of this kind comes from the Convention. No industry in America has profited so greatly from its convention work as have the brickmakers. The spirit which would lead members to stay away from this Convention would certainly have rendered the general work impossible. We urge that the attendance be large. No one who ever attended one of these meetings with an open mind ever went away from them without the full assurance of having made a large gain. No money which has ever been spent in connection with an improvement of brickmaking methods has brought as great returns as the money spent on Convention attendance.

BRICK FOR FOUNDATIONS.

Our friends who attend the Buffalo Convention and visit the great power house at Niagara should bear in mind that this great work is largely constructed of common brick. The brickmakers of Buffalo furnished 15,000,000 brick for the tunnel alone, and large quantities were also used in the foundations and piers. This, bear in mind, is in a locality where stone is plenty and cheap. The use of brick for foundations

has long since passed the experimental stage. It may be remembered that stone was formerly the only material thought of for a foundation. Now the matter of cost settles that question. Great sea walls of brick in any of the foreign ports are quite common. In Havre such material is in universal use. In Hamburg it is an approved material for that purpose, likewise in Amsterdam and many of the foreign seaports. Brick is an absolutely trustworthy material for all foundation purposes.

STREET PAVEMENTS IN BUFFALO.

The city of Buffalo is one of the best paved cities in the country. There is probably a larger relative area of smooth streets there than in any other city. Most are of asphalt, though there is a small amount of good brick streets, and an indication that there will be more. Brick, as a paving material, has had a great deal to contend with. There has been no general organization back of it. It has been pushed by companies and individuals not operating in harmony. A great deal of poor brick paving has been done. Cheap foundations have been used, and bad material has frequently crept in on the surface. Competition has at times been severe, and all sorts of devices have been resorted to for the purpose of securing the introduction of brick into a town or city, without regard to the ultimate influence which improperly constructed work would have upon the future of the brick paving business. We said that there are a great number of asphalt pavements in Buffalo. This is true, and we believe that the work has been unusually well done in this section. However, the results are by no means uniform. There have been catastrophes in asphalt paving which would have been all but disastrous to brick. But under a parent organization, commanding the best of skill, both in business and engineering, asphalt has continued from year to year to be a much-used material. We have often thought, in this connection, that if brick, as a paving material, could have been controlled by a few large organizations the future of the business would have been the gainer by it. Then certain fixed standards of quality for a surface covering could have been secured. The foundations would have been of the best, and in the end a unanimous voice for brick as a paving material would have been secured. As it is, many people with capital have rushed into the manufacture of paving brick in the past. Oftentimes they were without special skill, and much bad material was the result. Many of this class of operators have been weeded out, however, so that now we have a quality of paving material much more satisfactory than it was a few years ago. It takes something more than capital to make a good brick. It takes knowledge, and, as well, a splendid integrity. There is no question in the minds of those who are studying paving materials but that brick is the pavement of the future.

THE NATIONAL CONVENTION.

We are heartily in sympathy with the brother who is becoming impatient to grasp the other's hand at the National Convention. It is not complimentary to any brickmaker's business sagacity or social qualities to be uninterested in these annual gatherings. They are worth all they cost for either business or pleasure, hence he who profits in both is the gainer. Come loaded to communicate some new information, and be equally as ready to profit by what you hear as to give instruction to the unlearned, but don't come to bemoan the times. Brickmakers can be no exception in such a time of settlement as this. We are no more responsible for existing business conditions than are other industries, and not half as much as some, hence our hearts should take no undue share of sorrow and no humiliation whatever.

The up-to-date brickmaker is on the alert. He attends Conventions to learn what he can there; he reads the Clay-Worker regularly and writes for it frequently, and keeps his business

eye always on the advertisements, well knowing that if there is any new machinery the Clay-Worker knows where it is to be had, just as the maker of good machinery knows where to find purchasers. Come to the Convention. You will forever regret not being in that car which is to carry a load of good-looking men and women to the whirlpool in midwinter. You may need your overcoat. If you have one, be sure to bring it. If you haven't one, come without, and do as Brother Snell did at Atlanta.

THE GENUINE vs. THE COUNTERFEIT.

This is a rum old world of ours. Modern life is a strange intermingling of good and bad, the genuine and the counterfeit, and oftentimes so cleverly is the latter disguised that it not only passes current unquestioned, but really seems to have the preference. Whether this is due chiefly to carelessness on the part of the consumer is a question. Howbeit, we all know that the moth is irresistibly drawn toward the candle, and it seems that the most of us are as surely attracted by the sophistry of a "smooth story."

There came to our desk recently two magazines, each by its ponderosity and general appearance bearing the unmistakable stamp of a "Special Number." Compared one with the other, they illustrate finely the difference between the genuine and counterfeit. One, the "Tradesman," of Chattanooga, is a high-class industrial journal devoted to Southern trade interests. This "special" number comprises 266 pages, of which 138 are devoted to advertisements, and 128 to reading matter, the latter being almost entirely original matter, prepared especially for the "Tradesman" by the ablest and best known writers of the South. There are a number of feature articles written by the Governors of Southern States, and other celebrities. As a whole, the magazine is a splendid production, a veritable store-house of information on matters of interest to its constituency. It is a legitimate special issue, and is a lasting credit to its publishers, and will be preserved by its readers for its intrinsic merit alone.

The other, our juvenile co-temporary, is simply a collection of ads and trade announcements—just Chicago wind. It numbers 130 pages, nearly 100 of which are ads and write-ups, and the balance reading matter, such as it is—consisting mostly of reprint stuff, and yet the publishers lay the flattering unction to their souls that it is a great publication. Great, indeed, but only in the sense of humbuggery, not many of the clayworking craft but will see through the flimsy mask and rate it as it deserves, a fake special issue. Its publishers seem to take themselves seriously, and to really believe they have issued a genuine trade magazine. It is passing strange, the hallucinations that take possession of the minds of some men. Here in Indiana we have an asylum for them. Many of the inmates think they own the institution and the keepers humor them. These people think they are publishers, when in fact they are advertising fakirs—worthy successors to the late lamented Chas. T. Davis—nothing more, as a critical examination of their alleged magazines will show. Presume it is just as well to humor them.

After a deal of characteristic self-laudation in the course of which they arrogate to themselves credit for all the progress the craft has made during the past two years, they ask: "Why doesn't the CLAY-WORKER get out a 10,000 edition?" The answer is easy; simply because there is no occasion or need for such an issue. The CLAY-WORKER has never resorted to any such scheme, the sole aim of which is to "work" the advertisers for extra patronage. It is the business of a legitimate trade journal to cover its field at all seasons of the year, not once a year, and to give its readers something more than can be gleaned from a trade catalogue.

CALENDARS FOR '97.

We notice a marked falling off in the number of calendars received this season compared with former years. Either manufacturers are retrenching or calendars are less popular as adver-

tisements. Among the handsomest desk calendars we have seen is one received from the Main Belting Co., Chicago. It is a beauty and will adorn the editorial desk to the end of the year. The Eastern Machinery Co., New Haven, Conn., have one that is very neat. The figures being large make it suitable for brick yard use. An exceptionally handsome wall calendar comes from F. W. Silkman, dealer in clayworkers chemicals, New York. The first one we received was from Kendall & Flick, Washington, D. C. It is pretty and will serve to remind us that that firm are producers of Brickmakers Manganese.

The Atlas Bolt and Screw Co., Manufacturers of all kinds of dryer cars, have an attractive ad. on page 56. They are now installed in their new works, of which we shall have more to say later on, and are prepared to fill promptly orders for any number of any kind of cars needed for brick yard use.

The Chisholm, Boyd & White Company, Chicago, report a gratifying improvement in trade prospects. They have recently booked some good orders, and think there are more to follow. They have some clay-preparing machinery that they think will become very popular with press brick manufacturers. A new cut of their six-mold press is shown on page 5.

Geo. W. Sharer, Philadelphia, builder of the well-known Sharer brick drier, reports a decided improvement in trade, and predicts that with spring will come the long-looked-for busy season. He recently secured the contract for a new tunnel brick drier for the Pullman Brick Works, near Chicago, and says that inquiries from prospective builders are keeping him very busy.

Hardin, Bailey & Church make their initial bow to our readers on page 61, and request brickmakers to write them for prices of brick molds. They have equipped a factory with special machinery for the manufacture of brick molds, and think they can turn them out a little cheaper and better than any one else. Mr. Hardin is well known to brickmakers throughout the country, having made brick molds for many years past.

On page 60 we introduce Williams, White & Co., new aspirants for trade favors. Though strangers to the clayworking fraternity, they are experienced manufacturers of machinery, and have in the Kinkead soft mud machine and other equipment a line of brickyard supplies that have been tried and found satisfactory. They extend the "glad hand," and promise to deal liberally with the clayworking craft. Neither their machinery nor prices can be beat, they say, and solicit correspondence.

M. F. Williams & Co., St. Louis, are busy as can be, filling orders for their clay crushers and pulverizers, which are proving phenomenally successful, not only in pulverizing clays and shale, but in reducing ores, calcined fire clays, etc. What it can do in the latter line is indicated by the splendid testimonial from the Christy Fire Clay Company, given on page 9. Among recent orders received Messrs. Williams & Co. report one for two of these machines for a patron of the Clay-Worker at Christiana, Norway.

S. W. Vaughn, President and Secretary of the Turner, Vaughn & Taylor Company, Cuyahoga Falls, O., says the calls for their improved dry pans and other clay-preparing machinery make it necessary for their traveling men to take the road again. The change comes just in time to prevent total disability resulting from rusty joints. The past "season of rest" has been entirely too protracted for good health, and Mr. Vaughn is earnestly praying that it will not be repeated till he has taken a place on the retired list, for he would much rather wear out than rust out. As announced on page 78, Mr. Vaughn will take good care of any orders for brick, tile or pottery machinery that may be left on their doorstep.

Brick and Tile Manufacturers:

IF YOU WANT prices on any sort of Machinery, Kilns, Dryers or Brick and Tile Supplies of any kind address a Postal card to

The Clay-Worker, Indianapolis, Ind.

Stating just what you want and WE WILL DO THE REST.

A SONG FOR MEMBERS OF THE N. B. M. A.

PUT ME OFF AT BUFFALO.

Words by HARRY DILLON.

Music by JOHN DILLON.

Introduction.
Allegro moderato.

1. He caught the train at Al - ba - ny, and to the por - ter said, Put' me
2. The por - ter start - ed drink - ing and you'd think he owned the road, When he
3. When the brakeman shout - ed Cleveland, why the man jumped out of bed, And says we've

off at Buf - fa - lo, He was tired and took a sleep - er, and says
got to Buf - fa - lo, The train was way behind the en - gi -
gone thro' Buf - fa - lo, Then he saw the poor old por - ter with a

now I'll go to bed, Just to rest an hour or so, In an
neer he had a load, Take wa - ter he says, no, no, When the
bandage on his head, And his eyes swelled out, oh, oh, . . . His

un - der - tone he murmured "now I lay me down to wink," Put me
por - ter went to call his man, he got at the wrong berth, Says get
whis - kers they were san - dy, in the sand he done a jig, Put me

off at Buf - fa - lo, Then he tipped the por - ter saying, Port old
off at Buf - fa - lo, Oh the man he says you're wrong old boy, look
off at Buf - fa - lo, He says my wife was waiting at the

boy come have a drink, Put me off at Buf - fa - lo, oh, oh,
out you'll tear my shirt, I don't get off at Buf - fa - lo, oh, oh,
de - pot with a rig, Take me back to Buf - fa - lo, oh, I,

CHORUS.
Don't for - get to put me off at Buf - "Hal - lo," Oh, oh, my berth is low - er
Don't tell me you won't get off at Buf - "Hal - lo," Oh, oh, be quick and grab your
Thought I told you put me off at Buf - "Hal - lo," Oh, oh, there's trou - ble in the

five, If you find me hard to wake, Oh don't be a - fraid to shake, Throw me
clothes, Here's the hard - est guy to wake, Said the por - ter with a shake, They ex -
air, Oh the porter shook with fright, Yes, he turned from black to white, Oh,

off there dead or a - live, Mis - ter Por - ter when you call me in the
changed some good hard blows, Oh, the por - ter got a soak - er, but he
how that coon did stare, I'm a dead nig - ger now he whispered

morn, he says, I'll kick but of course it does - n't go, No
fired the man With a crash thro' the win - dow he did go, Then the
to him - self, Its my last trip on this road, I know, My

mat - ter what I say, Just re - mem - ber I'm the jay, That goes
man they should a - woke, In his sleep says that's a joke, Put me
good - ness sakes a - live, Here's, the gent in num - ber five, I put the

off the train, when you get to Buf fa - lo.
off the train, when we get to Buf fa - lo
wrong man off the train at Buf fa - lo

TABLE OF CONTENTS.

Buffalo's Great Commercial Structures.....	13	CORRESPONDENCE:	
Clay Glazes.....	14	Prosperity in Jersey.....	39
In Deutschland.....	18	The New York Market.....	40
Small Plants Here to Stay.....	20	Tribulations Incident to Making Stiff Clay Brick from Indiana Surface Clay.....	41
Foundations and Floors of Kilns.....	21	Gate's \$800 Tips.....	41
A Roamers Among The Romans.....	22	Drying Brick by Waste Heat of Kiln.....	41
New Arrangement of Continuous Klin.....	23	Gathering and Storing Clay for Dry Press Process.....	42
The Brick Industries of Galesburg, Ill.....	24	Down in Jersey.....	42
The Clayworking Industries of Victoria, Australia.....	26	The Situation at Chicago.....	42
Annual Convention of the National Association of Stove Lining Fire Brick Manufacturers.....	29	Kentucky, Ohio and Virginia Notes.....	58
Overwhelmed.....	30	Pacific Coast News.....	58
Brickyard Sketches.....	31	EDITORIAL:	
The Ohio State Convention.....	34	Brick and Tile Manufacturers Associations.....	43
How to Increase the Use of Brick.....	35	The Business Outlook for 1897.....	44
Transmission of Power From Niagara Falls to Buffalo Completed.....	36	Hard Times, An Old Man's Recollections.....	44
Too Much of a Good Thing.....	36	Good Times Always Follow Bad.....	44
Market Value of Fire Clays.....	37	Slow But Sure Methods Best.....	44
Obituary.....	37	For Pleasure and For Profit.....	45
The Cost of Cheap, Combustible Building.....	37	Brick for Foundations.....	45
An Exceptional Case.....	37	Street Pavements in Buffalo.....	45
Official Announcement.....	38	The National Convention.....	45
Prof. Orton's Pyrometric Cones for Measurement of Temperature in Kilns.....	43	The Genuine vs. The Counterfeit.....	46
With St. Louis Capital.....	60	Calendars for 1897.....	46
		Editorial Notes and Clippings.....	54
		MISCELLANY.	
		Put Me Off at Buffalo.....	47
		New Advertisements.....	48

BOOKS FOR BRICKMAKERS.

CLAY GLAZES AND ENAMELS, By H. R. Griffen. The latest and best work on Enameling Brick, Terra Cotta, etc. Tells just how to do it. Price.....	\$ 5.00
BRICKMAKERS MANUAL, By R. B. Morrison and J. A. Reep. Treats on making and burning brick in a plain practical manner. Price.....	\$ 3.00
SIXTY YEARS A BRICKMAKER, By J. W. Crary, Sr. The lessons of a life long brick-maker told in an interesting and instructive manner. Price.....	\$ 2.50
VITRIFIED PAVING BRICK, By H. A. Wheeler, E. M. An up-to-date book telling how and why Paving Brick should be made and used. Price.....	\$ 1.00
TABLE OF ANALYSES OF CLAYS, By A. Crossley. Contains the analysis of most of the American and European clays. Price....	\$ 1.00
PRACTICAL FARM DRAINAGE, By J. J. W. Billingsley. Tells how to make, burn and salt glaze drain tile, and why tile drainage pays. Price.....	\$ 1.00

A Little Library for Clayworkers,

All these books mailed to one address, Postage prepaid, for **\$ 10.00**

T. A. Randall & Co.,

Publishers,

5 Monument Place, INDIANAPOLIS.

INDEX TO ADVERTISEMENTS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page
H. B. Hilgeman.....	10	The American Clay-Working Machinery Co.....	88, 89
Ross-Keller Brick Machine Co.....	8	The Fernholtz Brick Press Co.....	7
Simpson Brick Press Co.....	6	Whitney, H. O.....	43
The Chisholm, Boyd & White Co.....	4, 5		

Brick and Tile Machinery.

Adrian Brick & Tile Machine Co.....	77	Steele, J. C., & Son.....	77
Anderson F'dry & Mach. Wks.....	81	Tallcot & Co., W. E.....	65
Baird & Son, H. C.....	63	The American Clay-Working Machinery Co.....	88, 89
Brewer, H. & Co.....	69, 87	The Horton Mfg. Co.....	80
Central Machine Works.....	64	The Eastern Machinery Co.....	90
Chambers Brothers Co.....	1	The Henry Martin Brick Mach. Mfg. Co.....	85
Chicago Brick Machinery Co.....	75	The Leader Mfg. Co.....	75
Eagle Iron Works.....	64	The Ohio Ceramic Engineering Co.....	57, 71
Freese, E. M. & Co.....	86	The Turner, Vaughn & Taylor Co.....	78, 79
Frost Engine Co.....	83	The Wallace Mfg. Co.....	59, 91
Hensley, J. W.....	62	The Wellington Machine Co.....	55
Kelis & Sons.....	63	Williams & Co., M. F.....	9
Means & Co., Jas.....	66	Wiles, A. M. & W. H.....	76
Michigan Brick and Tile Machine Co.....	67	Woolley Foundry & Machine Works.....	82
Newell Universal Mill Co.....	74	Williams, White & Co.....	60
Potts & Co., C. & A.....	11, 84		
Raymond & Co., C. W.....	49		
Stedman's Machine Works.....	77		

Brick Kilns and Dryers.

Alsip, Wm. & S. H.....	72	Pike, E. M.....	66
Columbian Pottery & Brick Kiln Co.....	65	Phillips, S. G.....	68
Conley & Wolfe.....	72	Reppell, L. H.....	70
Caldwell, J. K.....	70	Sharer, Geo. W.....	2
Eudaly, W. A.....	73	Swift, F. E.....	63
Hundt & Co, F.....	65	The American Blower Co.....	66
Leary, W. A.....	61	The Fernholtz Brick Press Co.....	7
Morrison & Co., R. B.....	73	The Standard Dry Kiln Co.....	12
		Wolff Dryer Co.....	92

Brick Yard Supplies.

Arnold, D. J. C.....	74	Mershon & Co., W. B.....	3
Buck, J. A.....	69	Newton, A. H.....	65
Joldewe & Co., G.....	62	Phillips & McLaren.....	61
Carnell, Geo.....	76	The Atlas Bolt & Screw Co.....	56
Cox, Geo. S.....	65	The Harrington & King Performing Co.....	3
Hardin, Bailey & Church.....	61	Wagoner, M. V. B.....	67
Marlon Steam Shovel Co.....	70	Walworth Run Foundry Co.....	76
Mey, F. H. C.....	62		

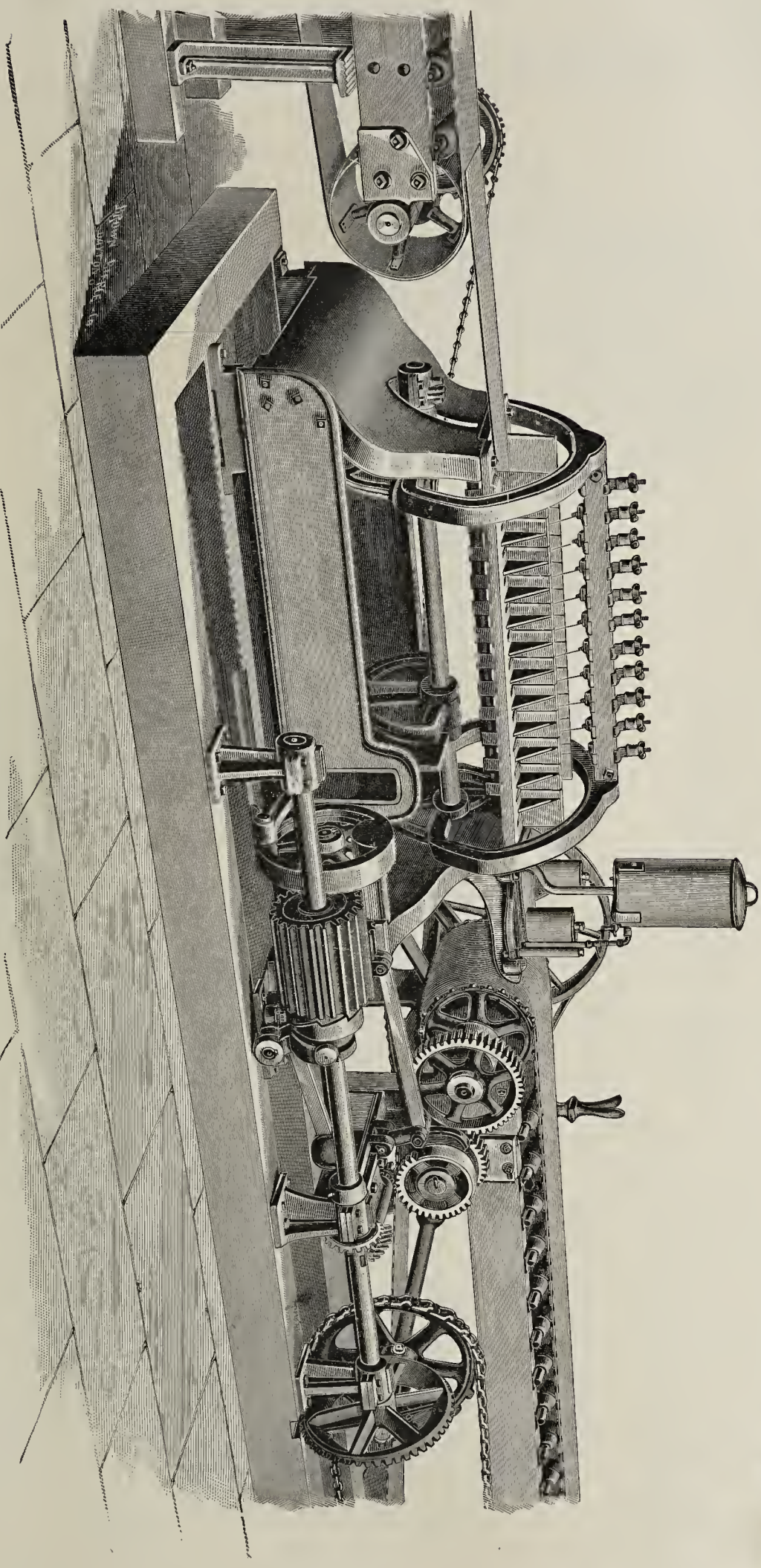
Miscellaneous.

Allis, F. H.....	63	National Fire Clay Mining and Manufacturing Co.....	67
Associated Trade & Industrial Press.....	61	Osborne, W. R.....	67
Balsley, G. S.....	66	Rochester Optical Co.....	64
Cincinnati Sewer Pipe Co.....	65	Ropkey Mason Engraving Co.....	71
Dean Bros. Steam Pump Works.....	64	Tennille, A. F.....	65
Dover Fire Brick Co.....	63	The E. W. Vanduzen Co.....	64
Evans & Howard.....	67	The Union Hardware Co.....	65
Hicks, George C.....	66	The Jeffrey Manufacturing Co.....	66
International Correspondence Schools.....	64	The Rockwood Mfg. Co.....	68
Jackson, John H.....	66	Small Ads., Wanted, For Sale, Etc.	
Kendall & Flick.....	64		
Main Belting Co.....	68		

NEW ADVERTISEMENTS.

Chisholm, Boyd & White Co., Clayworking Machinery, Kilns, Etc..	4, 5
M. F. Williams & Co., Clay Crusher and Pulverizer.....	9
C. & A. Potts & Co., Brick Machinery.....	11
The Wellington Machine Co., Brick Machinery.....	55
Atlas Bolt and Screw Co., Brick Cars.....	56
The Ohio Ceramic Engineering Co., Clayworking Machinery.....	57
Wallace Manufacturing Co., Clayworking Machinery.....	59
Williams, White & Co., Brick Machines and Moulds.....	60
Phillips & McLaren, Dry Pans.....	61
W. A. Leary, Brick Dryer.....	61
Hardin, Bailey & Church, Brick Moulds.....	61
J. W. Hensley, Brick Machines.....	62
F. H. C. Mey, Clay Conveyors.....	62
F. E. Swift, Kiln Furnace.....	63
F. H. Allis, Brick Yard Property.....	63
Kendall & Flick, Magnesia.....	64
Rochester Optical Co., Cameras.....	64
A. H. Newton, Brick Mould Sander.....	65
D. J. C. Arnold, Brick Yard Supplies.....	74
Chicago Brick Machinery Co., Clayworking Machinery.....	75
Walworth Run Foundry Co., Brick Cars.....	76
Turner, Vaughn & Taylor, Clayworking Machinery.....	78, 79
Anderson Foundry & Machine Works, Clayworking Machinery.....	81
Woolley Foundry & Machine Works, Brick and Tile Machines.....	82
Frost Engine Co., Brick Machines.....	83
Eastern Machinery Co., Brick Machinery.....	90

IT IS ALL OVER NOW,



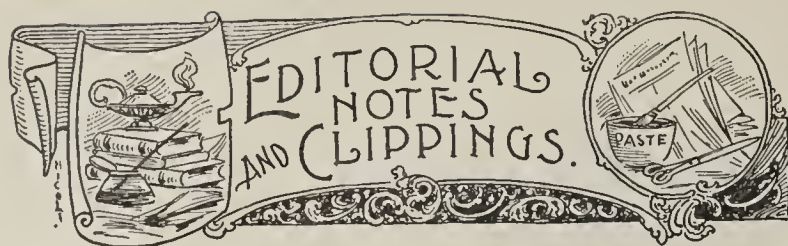
Raymond's Side Cut Automatic Table.

And, as you again return to making brick, we would remind you that we are on the market with a larger line of brickyard supplies than ever before, which we can furnish promptly and at reasonable prices. We furnish everything from the clay pit to the Kiln.

C. W. RAYMOND & CO.,

DAYTON, OHIO.

Send for Catalogue.



The death of Wm. Christy, brick manufacturer, occurred at Leesville, Mich.

D. F. Jones has sold his brick plant at Jefferson, Wis., to Chas. Stoppenbach.

Henry Mattel intends starting a brickyard at Henderson, Minn., in the spring.

Jno. Mims, Nevada, Mo., desires to purchase a new or second-hand disintegrator or pug mill.

Jas. O'Connor and J. J. Cottrell have formed a partnership at Phoenix, Ariz., for manufacturing brick.

The Tallmadge (O.) Pottery Company has been organized at Tallmadge, with a capital stock of \$50,000.

Clarence Tettel and A. Keets, of Adair, Mich., are going to establish a new brickyard at Williamsburg, Va.

Mr. F. Hapner, of Arcanum, O., expects to start a brickyard at Shelby, O., in the course of a month or so.

E. Williams, of Clarksburg, W. Va., has purchased the interest of A. Johnson in the brickyard at Lakeview, Pa.

Robert Wilson, Harrietta, Mich., is adding some new machinery to his plant, with a view of improving his product.

J. E. McCarty will establish a brick plant at Newport, Ind., in the spring. Mr. McCarty at present resides in Edinburg, Ill.

Easton & Sons, Kahoka, Mo., are adding new machinery to their works, with a view of increasing and improving their output.

Burns's brickyard, Montezuma, Ind., which has been idle for some time, will in all probability start up full time within ten days.

H. B. Snook, Union City, Ind., advises us that he is in the market for a good second-hand brick repress or a cheap new single mold machine.

The Garfield (Pa.) Fire Clay Company has in contemplation a number of improvements, by which it expects to double the present capacity of its brick plant.

B. N. Bryant, 705 Swiss avenue, Dallas, Tex., writes that he wishes to buy a second-hand drain tile machine, with dies from four to twelve inches in diameter.

Anderson & Leiper are making arrangements to put in one of the largest brick plants in the State at Little Rock, Ark. They expect to have a daily capacity of 40,000.

B. P. Jegglin, of Burlington, Kan., says he has discovered a fine potters' clay at that place, and expects to start a factory there for the manufacture of jugs and flower pots.

The Olive Hill (Ky.) Fire Brick Works will add six mammoth kilns to their plant and double the capacity of their drier in order to meet the increasing demand for their brick.

Garig, Reddy & Co., of Baton Rouge, La., in a recent letter inclosing renewal of subscription, advise us that they are in the market for a second-hand Creager brick machine.

In a recent communication R. Helfenberger writes that he is going to start a small brick plant at Glen Mary, Tenn., and wishes to purchase a second-hand steam-power single repress.

The Bliss & Laughlin Company has been incorporated at Harvey, Ill., to manufacture tile. J. W. Hyde, E. W. Chesterman and Y. C. Fry are the incorporators. The capital stock is \$65,000.

The Catskill Shale Brick Company, with extensive works at Catskill, N. Y., has gone into the hands of a receiver. The plant had only been in operation about a year, and is assessed at \$200,000.

Jas. Norcross, of the firm of Norcross Bros., Worcester, Mass., has sold for \$8,000 his interest in the plant to his brother, who will operate the business on a larger scale than ever before.

The Baden (Cal.) Brick Company are going to erect a number of new kilns and otherwise improve their brick plant. They now produce a brick that they claim is equaled by none in the State.

A new firm, to be known as Deegan, Davy & Co. (L't'd), has been formed for the purpose of manufacturing brick near

Bridgeport, Pa. Jno. C. Deegan, an old-time brickmaker, of Upper Merion, Pa., is interested, and has with him Jos. Bush, of Kensington, and C. L. Davy, W. Myers and J. H. Lock, of Philadelphia, Pa.

N. M. Coffran & Co., who have been manufacturing brick at Cambridge, Mass., for many years, have bought a large tract of land at Epping, N. H., and expect to open a brick plant there in the spring.

A. H. McInnes is making arrangements to operate the brickyard at Mill Valley, Cal., which has been idle for some time. Mr. McInnes says he expects to be in full working operation by the middle of February.

Chas. F. Dunn, of San Miguel county, New Mexico, has discovered a good brick clay near Elizabethtown, N. M., where he intends to erect a plant and commence the manufacture of fire brick in a short time.

E. E. Spencer has sold his interest in the Gas City (Ind.) Pottery Company to H. Pontius, D. W. Cox and D. W. Hartman. These gentlemen will organize a stock company and double the capacity of the plant.

H. C. Carroll has withdrawn from active work in the brick manufacturing firm of H. C. Carroll & Sons, West Philadelphia, Pa. The business will be continued by M. J., E. H. and P. T. Carroll under the old firm name.

The brickyard at Cicero, Ind., belonging to Wm. C. Rehling, of Indianapolis, burned to the ground the 27th ult. Mr. Rehling is as yet undecided whether he will rebuild. The loss is \$8,000, on which there is no insurance.

Under date of the 22d ult., Father Cray writes that they have just closed their last kiln of brick for the season, and that they expect to add a number of improvements to their plant at Bluff Springs, Fla., in the spring.

Jno. J. Mabbett, brick manufacturer, of Herkimer, N. Y., made an assignment Jan. 4. This was brought about by the action of some of his creditors, but it is thought that in all probability he will pay out dollar for dollar.

One of the boilers at J. P. Alexander's fire brick works, Akron, O., exploded, the 4th inst., completely wrecking the boiler room. Fortunately the plant was not in operation at the time of the explosion, so no one was hurt.

Catlin, Boch & Channel have purchased the brick works of Hess, Crotty & Williams, situated at Brickton, Ill. The office of the firm is in Ottawa, and they expect to keep the plant, which has been idle for some time, running full time.

In a recent communication Houlahan & Griffith, brick manufacturers at Los Angeles, Cal., say: "We greatly appreciate the work the Clay-Worker is doing for the clay industries, and enjoy reading it as it makes its monthly visit to our office."

The Nelsonville (O.) Sewer Pipe Company's factory was burned to the ground Dec. 30, entailing a loss of \$50,000, part of which is covered by insurance. One hundred and twenty men are thrown out of employment for a time. The plant will in all probability be rebuilt.

R. O. Condrey died at his home in Manchester, Va., Dec. 29. Mr. Condrey had been engaged in the manufacture of brick all his life, until the last two years, during which time ill health had prevented active participation in the business. He was in his forty-eighth year, and unmarried.

The dry house of the Sheridan (Ind.) Brick Works was discovered in flames early in the evening of the 19th ult. By hard work in using the almost perfect system of water works at the factory the fire was extinguished before it reached the main buildings. Only a slight damage was sustained.

The Moline (Ill.) Manufacturing Company are endeavoring to reorganize in order to infuse new life in the company, which was organized some years ago for the manufacture of brick. In case they are successful the entire plant will be remodeled and operations will begin at the works in the spring.

Cuero, Tex., has a new brickyard, which will be operated by Koenig & Metzner. The former is the moneyed man of the firm, while R. A. Metzner is the practical brickmaker. They are equipping their plant with modern machinery, and expect to have a plant second to none in the Lone Star State.

The Bushnell (Ill.) Pressed Brick Works passed into the ownership and management of the Illinois Supply and Construction Company, of St. Louis, Jan. 1. The new firm is going to greatly increase the capacity of the plant, and expects to make the brick business one of the important industries of Bushnell.

The death of Jno. Egge, Sr., the oldest continuous resident of Allentown, Pa., occurred at his home there, after an illness

[CONTINUED ON PAGE 56.]

The Wellington Machine Co., Wellington, Ohio,

Manufacturers of

THE "MONARCH" AND
THE "IRON QUAKER"
BRICK MACHINES,

And all Yard Supplies.

One Pecularity

Of the "MONARCH" Brick Machine is that its many good features are not **fully** realized and appreciated unless it is seen **in operation**. Many who have studied the illustrations and descriptions have said when they **saw it at work**, that it surprised them and surpassed expectations.

It Will Run

During the Convention week at Brush Bros., yard and we invite you to investigate and **figure what its use will save you**.



BALL-BEARING TRUCKS AND BARROWS.

No One Else Makes Them.

General Lumber Co.
Cleveland, O.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

of three weeks. Mr. Egge was eighty-eight years old, and had been engaged in the manufacture of brick from the time he was a boy until eight years ago, when he retired on account of his age. Mr. Egge was a highly respected citizen in the community in which he lived, and will be sadly missed by his large circle of friends.

Mr. Jas. R. Busey, senior member of the brick manufacturing firm of Jas. R. Busey & Son, Baltimore, Md., died of consumption of the stomach Dec. 18. Mr. Busey was seventy years old, and had been in the brick business all his life, having started in when he was but a young man. Three sons and one daughter survive him.

T. & T. J. O'Gorman are removing their pottery from Ottawa, Ill., where they have been in business for a number of years, to Streator, Ill., where they think they can secure better clay, and expect to erect a large building especially for their use in the spring. The articles they will turn out will include flower pots, vases and urns.

W. D. Budd, of Dutchess Junction, N. Y., is going to build a new and model brickyard. Geo. W. Smith, a neighbor brick manufacturer, will draw up a plan for Mr. Budd for laying out the new plant, including the building and sheds. The best and most improved machinery will be used throughout the works. Mr. Budd will in all probability lease his old yard.

The works of the J. M. Blair Brick Company, Cincinnati, O., are now being put into condition for the immediate resumption of work with the opening of spring. The total capacity of the yards is 30,000,000 brick per year. J. M. Blair says they anticipate a good demand for brick the coming season, for there are a large number of large building enterprises that already have brick engaged, and there are many more that have not yet arranged for the brick.

Frank G. Lotterer, owner of the Fort Scott (Kan.) Vitrified Brick Plant, recently conceived the idea of making patent vitrified brick blocks for curbing and sidewalks for cities, with apertures for running wires through each. He proposes to secure patents on the idea, and will present the project to electric wire companies. The blocks can be made with a capacity for any number of wires, and are absolutely proof against the

elements or fire. Mr. Lotterer has also applied for patents on sectional fence posts, railroad ties and building veneering, all to be made of vitrified brick and produced at much less cost than those now produced from wood.

The sewer pipe works of the upper Ohio valley, around Stenbenville, Toronto, New Cumberland and East Liverpool, are all more or less overstocked from the past season, and will not be overly active in the earlier part of the approaching season. The demands of late have by no means met the expectations of the manufacturers.

The Commercial League, of Maunington, W. Va., has been negotiating for several months with a company contemplating the erection of an immense glass, china and pottery works, to cost not less than \$150,000 and to employ two hundred hands. The matter is yet indefinite, owing to interest evinced in the plant by both Pittsburg and Wheeling.

The massive Chelsea China Works, at New Cumberland, W. Va., that have been advertised for sale for quite awhile, may be taken in hand by Pittsburg parties and operated on much the former scale, negotiations looking to that end being now on. This was once the leader of that section, and came to grief through an ineffectual effort to crowd out all its smaller rivals.

Patrick Connor, owner of a sewer pipe works at Calumet, O., opposite New Cumberland, W. Va., has a process by which he makes a glazed fire brick, with a face or edge, as desired, as hard and white as stone china. The bricks, preparatory to burning, are dipped into a solution, the ingredients of which are known only to Mr. Connor, and a coating probably an eighth of an inch thick adheres. He will build several special kilns for the burning of these brick, on which he hopes to make a fine run.

We regret to note the assignment of Capt. W. S. Williams, of Canton, O. The inability to make collections or an opportunity to realize on his resources and the demand of a few creditors were the cause for same. Mr. Williams's liabilities were only \$35,000, while his assets amount to \$100,000, his brick plant, with the valuable clay land surrounding it, being worth more than \$35,000. In common with Captain Williams's many friends, we trust his embarrassment will be but temporary, and that he will be able to weather the storm bravely.

THE ATLAS BOLT & SCREW CO.,
CLEVELAND, O., U.S.A.

MANUFACTURERS OF

STEEL BRICK DRYER CARS,

SMALL CARS OF ALL KINDS.

STEEL DRY KILN, LUMBER TRUCKS,

STRONG, LIGHT AND EASY RUNNING.

FULL LINE STEEL WHEELBARROWS.

Illustrations and captions:

- No. 146. TURNABLE.
- No. 150. STEEL BOTTOM DUMP.
- No. 170. STEEL SIDE DUMP.
- No. 201. OAK SIDE DUMP.
- No. 142. TRANSFER CAR.
- No. 124. DOUBLE DECK.
- No. 126. D.D. STEEL DECK.
- No. 136. 3 SECTION RACK.
- No. 105. SOFT MUD FLAT.
- No. 103. STIFF MUD FLAT.
- No. 108. FLAT, STEEL DECK.
- No. 133. SOFT MUD RACK.
- No. 140. BOX SHOOKS, Etc.
- No. 139. SHINGLES, STAVES, Etc.

“Don't Do a Thing Until You Hear From Us.”

Don't purchase any machinery or apparatus for face brick work, either plastic or dry press.

Don't buy any paving brick machinery.

Don't buy any presses, for any purpose, or any molds or dies for ornamental brick.

Don't build a dryer or kiln of any kind.

In fact, don't decide upon any improvement pertaining to the art of brickmaking until you have first ascertained what we can do for you.

Our knowledge and experience are at your command.

If we cannot help you it will cost you nothing.

We are in this business to stay. Our facilities are unexcelled. We are building up a reputation for honest work and successful results.

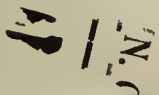
Some of the largest and most prosperous pressed brick companies have benefitted by our service. You may do likewise.

Our prices are moderate. and our work guaranteed.

Send us your address for our new Catalogue.

Watch this page for improvements in machinery, dryers and kilns.

With best wishes for the New Year,


The CERAMIC ENGINEERING CO.,

Office and Works 59-63 Center St.,

CLEVELAND, OHIO.

KENTUCKY, OHIO AND VIRGINIA NOTES.

The Clinton Fire Brick Works at Ashland, Ky., sustained a loss of probably \$1,000 by fire, which destroyed a supply and oil house on the 13th inst., in which was stored, as well, all their molds for special design orders.

For many years it has been a question of considerable speculation among clayworkers of eastern Kentucky as to whether the Carter county clay veins, that drifted deeply toward the Ohio river, continued beneath Boyd county as well. Recent tabulations of results in the boring of test oil wells in Boyd county show the presence of the veins unquestionably, and at depths that do not preclude their being profitably worked.

The fire clay mining business of the Limestone (Ky.) Mining and Manufacturing Company, which has been conducted for three years past under the management of Thomas Henderson & Son, of Ashland, Ky., has reverted to the original promoters by the expiration of the lease, and the work will be pushed on the same lines as heretofore.

Nothing has developed to date in the matter of another fire brick company at Olive Hill, Ky., projected by Cincinnati and Chicago capital, although many unverified rumors have been floating of late regarding the deal.

The Kentucky Pottery, at Catlettsburg, under lease to J. P. Weaver, is running regularly, with an output entirely of jugs and the smaller varieties of jars and crockery.

There is talk of a local company forming soon at Waco, Ky., for the manufacture of pottery, the Madison county potters' clay being of the best in the State and of easy transportation at this point.

The Maysville fire-brick yards are idle, and have been so for several months. Conditions are identical with the red brick works, the building demands of late having fallen off to an extent seldom experienced.

Gutthell & Schneider, of Columbus, O., contractors for the erection of the five new buildings at the Ohio Hospital for Epileptics, at Gallipolis, O., are operating a brickyard at that point which will manufacture all the brick used in the buildings.

A general reduction in wages has been made at the plant of the Great Western Fire Clay Company, of Toronto, O., one of the largest sewer pipe concerns in the country.

The South Webster (O.) Fire Brick Works have secured the contract for furnishing the brick for the Ohio University, at Athens, O., and will be busy in consequence for some time.

The McManigle Brick Works, at Middleport, O., went into a receiver's hands two weeks ago, and are at present shut down indefinitely. The plant manufactures both red and paving brick.

The Parker & Austin Fire Brick Works is the only one of the Ironton, O., trio that is idle, but they have an extensive stock on hand of their best grades.

Both the Wheeling and Warwick Potteries, at Wheeling, W. Va., have resumed, after a two weeks' idleness following the holidays, which was taken up mainly in overhauling, repairs, stock taking, etc., and expect to be able to keep going steadily from date. Indications of late are more promising for continued activity than in many months.

A pottery is soon to be started at the new town of Chester, opposite East Liverpool, O., the clay deposits, according to report, quite equaling those of the Ohio town.

As soon as the weather will permit, the Central City Brick Works will resume, in order to stock up for an expected early rush of demand from Huntington, which town is expected to make substantial increase in a building way the coming year.

Work is being vigorously pushed on the completion of the large plant of the Camden Clay Company, at Spillman, W. Va., and it is expected that operations may begin by the 1st of March, some unexpected delays having been experienced as regarded material and machinery.

C. O. L.

PACIFIC COAST NEWS.

"The State of Washington abounds in good clays, and in time will lead on this coast, when the fullest development is made," says George W. Kummer, in the Register, of Seattle. The high prices for common brick in Seattle, Spokane and other places induced large capital to engage in the clay business, with the result of sinking many thousands of dollars in mud banks that will never be recovered, besides leaving a capacity in the clay business which is now far in advance of the needs of that State. In Washington there are many pure veins of clay, deposits as clearly defined as coal veins, and from such clays the superior clay wares of the State are made. These clays are mostly found in the mountainous regions. One important characteristic of Washington clays is the fact that they will burn to a much higher degree of heat than the Eastern

clay. The Denny Clay Company deserve the credit for having advanced the clay business in that State, opening up veins from which pressed brick of a dozen or more colors are made without an ounce of coloring matter being used. This company has also discovered and opened a vein of pure flint fire clay. For the past two years the pay rolls of this company have averaged \$10,000 per month, and has reduced the prices from 50 to 125 per cent. Pressed brick formerly commanded \$65 to \$100 per thousand, and now sells for from \$25 to \$40. The manufacture of pottery in the State is more recent, but a factory is now running at Auburn that is said to be putting out elegant ware.

The will of George Chambers, who died in Illinois on Oct. 15, has been probated. His estate in California consists of \$45,000 worth of stock in Gladding, McBean & Co. The testator bequeathed everything to his widow and children.

The Remillard Brick Company, of Oakland, report many inquiries, and expect a considerable amount of business the coming spring.

Articles of incorporation have been filed at Phoenix, Ariz., by O'Connor & Cottrell, brick masons.

The Los Angeles Pressed Brick Company is manufacturing some extra fire brick from the clay mine of W. E. Sloane, at Temescal, near Riverside.

The terra cotta department of Gladding, McBean & Co., at Lincoln, Cal., has resumed, running full time on a big contract for the University Building in San Francisco.

The Stockton, Cal., Art Pottery Company has purchased the Columbia Pottery, and Mr. Blakey will have charge of the manufacturing.

The Elsinore, Cal., Fire Brick Company is the name of a new concern, consisting of Lewis & Sons and John D. Hoff.

The Baden Brick Company has decided to build, early this month, extensive patent kilns. Their clay has proven itself to be of extra fine quality.

Bazel J. Meek, brick manufacturer, of Chillicothe, Mo., is in Albuquerque, N. M., where he has invested in some mining property.

Frank Foster, of the Pottery Works of Boise, Ida., has given a realty mortgage for \$553, and Prendergast Bros., of Portland, Ore., brick manufacturers, have given a chattel mortgage for \$225.

A plant for the demonstration of the work of E. C. Brice's patent process for making brick and all kinds of terra cotta, pipe, etc., is now being erected at Baden, Cal., by Messrs. Duncan, Dunbar & Davis, well-known contractors and brickmakers of San Francisco. The plant will soon be completed.

R. F. Angulo has opened a Mexican tile factory at Montecito, Cal.

N. Clarke & Son have concluded to erect another two or three-story brick structure, 100x100 feet, at the northern end of their property on Pacific avenue, Alameda, Cal., to be devoted exclusively to the manufacture of terra cotta. The works have just completed an \$8,000 contract for terra cotta fire-proofing, etc., on the new Kings county, California, courthouse. They have also been awarded the contract for the terra cotta to be used on the new depot at the ferries in San Francisco, a contract which may run up to \$50,000. Clarke & Son seem to have had a prosperous year. Only a short time ago an addition, 84x120 feet, was made for the manufacture of terra cotta and fire brick, and two large new furnaces were put in during the year. They have had an average of fifty men at work daily for the past year, while two years ago there were only about thirty. Says A. V. Clarke, Superintendent and junior member of the firm: "We are just getting ready to go into the terra cotta building business, as well as to manufacture the material." This firm was first established in business near Sacramento, Cal., and Mr. Clarke, Sr., has been in the business over forty years. His son, George D., now manages the business end in San Francisco, and A. V. Clarke, who is a member of the Municipal Trustees of Alameda, is Superintendent at the works. On Jan. 1 the works began, with a full force, on terra cotta.

SUNSET.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

FOR SALE, CHEAP—Two Grand automatic brick machines, with pug mills; one Eureka dry press, with Steadman crusher and disintegrator; one tubular boiler, 5x16 feet, with outfit; 60,000 wood pallets, 33x10x¾, by

JAS. F. GRAHAM, Memphis, Tenn.

WANTED—1 good second-hand 2-mold stiff mud brick repress for standard size brick.

1 second-hand pug mill, 14 feet long, for pugging fire clay for stiff mud brick.

65 double-decked brick dry cars, with slat floors.

1 hand-power side-cutting table for stiff mud brick.

Address E. care CLAY-WORKER.

The Cummer Brick and Tile Dryer.

(PATENTED.)

DIRECT HEAT.

Please detach this sheet and answer the following questions as clearly and accurately as possible ; also, if convenient, furnish us with a rough pencil sketch showing the location of your tunnel dryer, and also of clay dryer, if you need one, the relative position, with distances between each *plainly marked*, of Engine, Boiler, Brick Machine or Machines, Burning Kilns and all nearby buildings, and on receipt of the information asked for, it will give us pleasure to submit a proposition to you for your consideration based upon your requirements.

Yours faithfully,

THE F. D. CUMMER & SON CO.,
CLEVELAND, O.

1. What kind of clay product do you manufacture, and what kind of fuel do you use ?

2. What make and class of machine do you use, and what is its daily capacity ? State whether stiff mud, soft mud, dry press or semi-dry press.

3. What is the general nature of your clay ? State whether shale, fire, porous, or plastic clay.

4. How does your clay dry in the open air ? Does it crack when subject to sun and wind ?

5. What is the size of your brick or other product ?

6. What daily drying capacity do you wish ?

7. About when do you contemplate putting in a Dryer ?

8. If convenient, please send us a small sample of your moist clay in its average condition for our inspection and test (about 5 lbs.) ; also one dried and one burned brick.

9. What is the average weight of your green bricks ?

10. What is the average weight of your bricks " bone dry ? "

11. What is the extreme length which you can allow for tunnel building including transfer track at each end ?

12. General remarks :

.....(Name.)

189.....

.....(Address.)

[OVER.]

What
Does
Your
Brick
Drying
Cost
Per
M
?

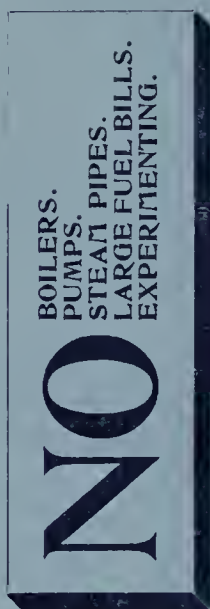
We Guarantee Twice as Much Drying

As any other kind or style of drying apparatus in the world.

In a given space,
In a given time,
With a given amount of fuel,
With a given number of cars,

And our Direct Heat Tunnel Dryer is Drying for the following Costs:

Cost of Slack Bituminous Coal, per net ton.	Cost of Drying per M Stiff Mud Brick, 1 1/4 lbs. moisture per brick.
\$1.00	5. Cents.
1.10	5.5 "
1.20	6. "
1.30	6.5 "
1.40	7. "
1.50	7.5 "
1.60	8. "
1.70	8.5 "
1.80	9. "
1.90	9.5 "
2.00	10.0 "
2.10	10.5 "
2.20	11. "
2.30	11.5 "
2.40	12. "
2.50	12.5 "



What could You save per year by adopting our System?

We can dry all kinds of brick carrying different amounts of moisture at proportionate prices. We can dry the most tender clays.

All We Ask

Is an opportunity to prove to your satisfaction that we can do what we claim. It will cost you nothing to investigate.

WILL YOU NOT DETACH THIS SHEET, FILL OUT THE BLANK ON THE OTHER SIDE, FORWARD TO US, AND PERMIT US TO TAKE THE MATTER UP WITH YOU?

The F. D. Cummer & Son Co.,
Cleveland, Ohio.

 We can attach our system to your present tunnels at slight expense.

[OVER.]

The Past is of no Value Except as a Guide to the Future.



THIS is pointing to the past which recalls to the minds of many brick manufacturers that the past four years have been full of trials and tribulations.

A Noted Divine once said that if a man continually looked in the past, he would go crazy.



THIS is pointing to the future which is full of hope and promise. The same N. D. said it was well to look backward occasionally to recall past experience in order to

not make mistakes, as all must find reward in the future.

Look forward to the National Brick Makers Association meeting and be in attendance, and you will hear many reminders of the past that should govern your future in brickmaking.

Brick that were made in the past, were hand made and full of straw, A large proportion of the brick of the future will be made on improved **Wonder Brick Machinery and Cunningham's Automatic Side and End Cut Brick Cutters** and other clay preparing machinery made by

The Wallace Manufacturing Co.,

No. 15 Catalogue Free.

FRANKFORT, IND.

—•See "Ad" on Back Inside Cover Page.♦—

WITH ST. LOUIS CAPITAL.

**Two Large Clay-Pipe Factories to be Established in Mexico
—The Business to be Protected by the Mexican
Government.**

MR. JAMES GREEN, of St. Louis, has just received a concession from the Mexican government to establish two large clay-pipe factories in that country. He has a contract to make all the sewer pipe required by that government for the next ten years. The concession and contract have already been signed, sealed and attested, and they are expected to arrive in St. Louis to-day.

One of the factories will be located in the City of Mexico, and work will be commenced on it in a few weeks. The other will be located wherever President Diaz, of the Republic, directs. The introduction of the clay-pipe manufacturing industry into Mexico was brought about by Mr. Green after about five months' active work. He was in Mexico about two years ago, and it was then that he conceived the idea. He has already put up the necessary bonds for the concessions, and the documents, which are expected to-day, are accompanied by \$1,250 in canceled Mexican revenue stamps, which amount Mr. Green paid. The concession calls for an investment of \$250,000 in ten years, and the \$1,250 tax is on the basis of one-half per cent. of the proposed investment. Mr. Green expects to go to Mexico next week to look over the ground, preparatory to establishing one of the factories.

The concession is especially valuable, as none of the Mexican cities are properly sewered. There are practically no clay-pipe sewers in the country at present. A large drainage canal to connect the capital of Mexico with a river some thirty miles distant has just been completed, and sewers are now needed by the city to connect with that canal.

Mr. Green is to have the privilege of importing into Mexico

free of duty building material, machinery, tools and everything else necessary to begin business. The capital invested by the company in establishing and developing the industry shall, according to the concession, enjoy immunity from every direct federal tax. To the company is also given the same privileges in the erection of warehouses, workshops, etc. According to the contract, work must begin on the first factory in six months and work on the second within a year. Both must be completed within two years. Transfer of concession is not permitted, nor may any foreign government or state secure control of it. The contract stipulates that two students of the National School of Mexico may enter the factories, whenever the government so desires, to study the manufacture of vitrified clay piping under the direction of the company. The company is also obligated to furnish data and statistics to the government whenever called upon.

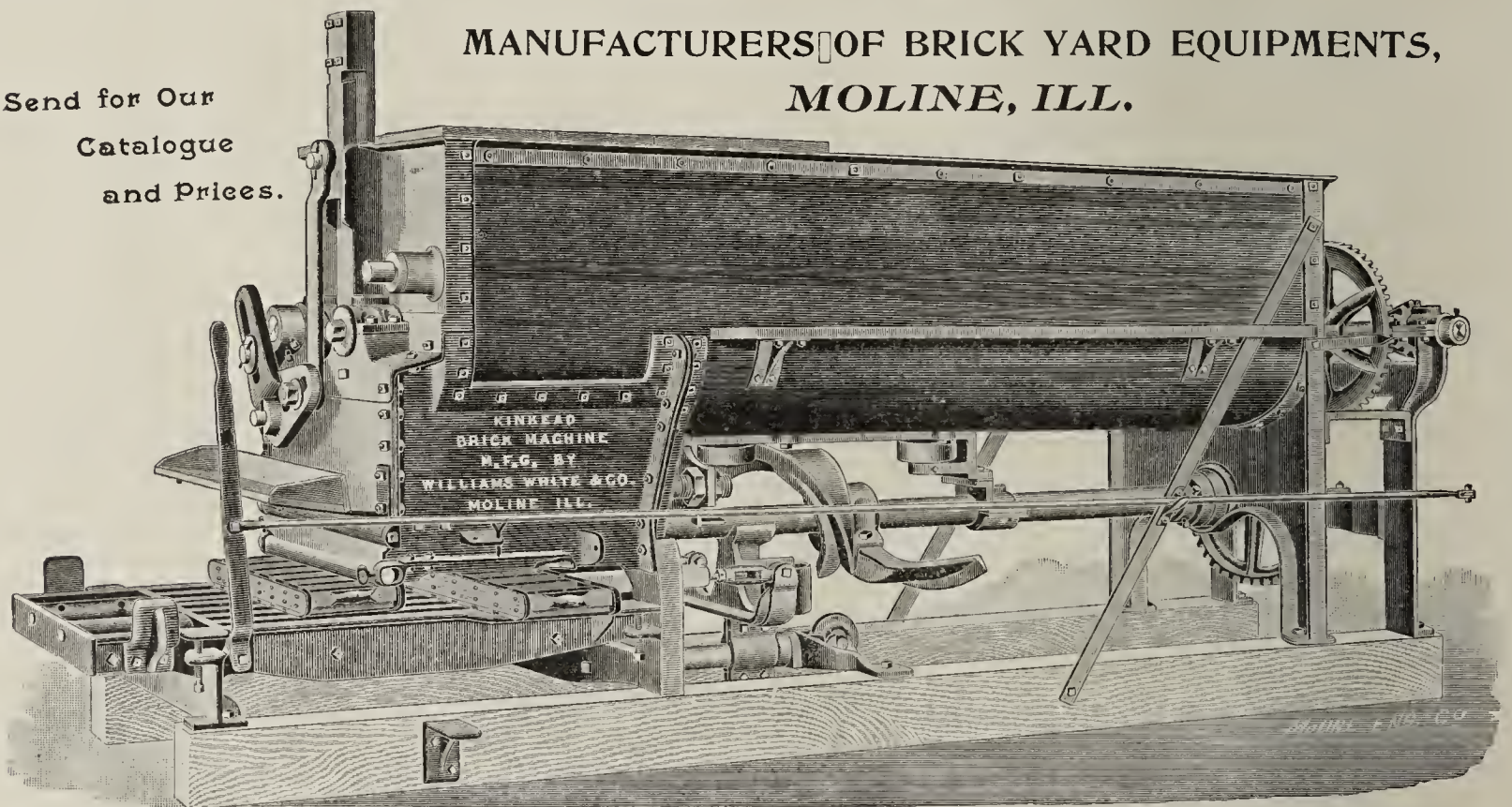
Mr. James Green, the concessionaire, is President of the Laclede Fire Brick Company, President of the Helmbacher Steam Forge Company and owner of the Jupiter Furnace Company, all of St. Louis. He is also President of the Sedalia, Mo., Gas and Electric Light Companies, of the Moberly, Mo., Gas and Electric Light Company and of the Greencastle, Ind., Gaslight Company. He also built a clay-pipe factory at Denver, but sold it some time ago.

"Yes, I have received the concession," said Mr. Green, last night. "This will be an eye-opener to many of our St. Louis capitalists, as it shows that we can have business relations with the Mexican government in more than one way. The factories will be big successes. Peon laborers can be secured in Mexico at about 20 cents a day, and we can get excellent prices for our product. The facilities for manufacturing vitrified clay pipe in Mexico are excellent. All we need is the machinery, a few experts and the clay. The machinery will be imported free. I will send three or four experts down there, and clay is plentiful. I have a number of samples of vitrified clay pipe, which I had made at our Cheltenham plant out of Mexican clay, and they are just the same as the American clay pipe. I will go to Mexico in a few days, and we will begin work on the first factory without loss of time. My bond has been deposited in the National Bank of Mexico, and everything will be hurried along to the actual manufacture of vitrified clay pipe in Mexico."—Globe-Democrat.

WILLIAMS, WHITE & CO.

MANUFACTURERS OF BRICK YARD EQUIPMENTS,
MOLINE, ILL.

Send for Our
Catalogue
and Prices.



We make improved Brick Molds, Trucks, Barrows and Cars of all kinds. Everything we make is sold under a positive guarantee. We make the BEST as well as the CHEAPEST Clay Disintegrators, Mold Sanders, Elevators and Brick Yard Supplies of Every Description. **Special Prices on Molds Ordered Before February 15th.**

FOR SALE—One Monarch machine, perfect order, price \$200, or will trade for Martin's Letter A, and pay difference; also for sale, a four-mold Simpson dry press; cost, \$4,000; price, \$2,000; only made 20,000 brick on it. Address **BARGAINS**, No. 928 Ellicott Square, Buffalo, N. Y. 12 d

WANTED—A permanent situation as foreman or superintendent of brick works. Have had fifteen years' experience, and can manage successfully either tempered clay or stiff mud plant. Can give best of references as to character, sobriety, etc. Would prefer a location west of Chicago. Address **ALBERT**, Care Clay-Worker.

WANTED—Re-engagement as superintendent of fire brick works; thoroughly experienced in fire brick manufacture, also architectural and paving brick, particularly the former. First-class references. Address **"FIRE BRICK,"** Care Clay-Worker. 10 4 d

WANTED—Situation as superintendent of dry pressed brick works, by a man who is thoroughly practical in every department of manufacturing same. References given. Address **ST. LOUIS**, 11 c Care of Clay-Worker.

CORRESPONDENCE solicited with parties desiring to purchase a fine brick plant (or half interest, if preferred), suitable for fire, buff or mottled brick. **H. P. MERSEREAN**, East Richmond, Va. 11 1 p

I WILL LEASE OR SELL my plant at a reasonable price to one familiar with the roofing tile business. The factory cleared last year \$20,000 (twenty thousand dollars), and is doing better than that at the present in all these hard times. Will sell all or part of it, or will give long lease at reasonable price to the right party. Why do I wish to dispose of a good thing? That's my business. **ARTHUR**, Care Clay-Worker. 9 tf d

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cent a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE—One 40-inch Steadman clay pulverizer. Cheap. Address 12 1 d **"K.,"** Care Clay-Worker.

FOR SALE—Raymond Columbian repress. Only used a few months, and in good condition. \$250 cash. **HYDRAULIC BRICK CO.**, Louisville, Ky. 11 d

WANTED—Prices on 225 green-brick cars, 4,000 feet of light T rail, 2 transfer cars for brickyard purposes. **R. MOULTROP & SON**, Euola, Ala. 13 d

WANTED—Position as setter and burner; understands brick machinery; burn clamp kilns; experienced in brick-making all my life; age, 34 years. Address 12 cm **JOHN**, Care Clay-Worker.

FOR SALE—Second-hand Chambers C. C. D. brick machine; one Penfield brick machine, with all pipes and fixtures necessary; two patent Phillips driers. Apply **BILTMORE BRICK AND TILE WORKS**, Biltmore, N. C. 11 d

WANTED—Practical man to take interest in dry pressed brick plant. Finest clay and shale in the South. Investigate. Address **"CORBIN,"** Care Clay-Worker. 11 cm

FOR SALE—Penfield latest improved upright stock brick machine, with shafting, friction, clutch pulley and elevator, all complete, in first-class condition; only used one month; also 4,000 pallets; all very cheap. Address **ROBINSON**, Care Clay-Worker. 11 d

WANTED—Situation by a practical brick setter and burner of forty years' experience, also an expert in any kind of brick machinery. Can furnish first-class credentials and can guarantee my work. **COLEMAN**, Care Clay-Worker. 11 c

WANTED—A competent clay molder, one who can make molds from drawings, has had experience in making terra cotta finials and roof ornaments, and can take charge of molding department. Address, with references, **H. B. S.**, Care Clay-Worker. 1 tf L

WANTED—To the right parties, having "capital," would like to correspond, with view of their investing \$50,000 in the best equipped pressed brick plant in Ohio. An abundance of finest red and buff clays. Address **"GOOD THING,"** Care Clay-Worker. 11 c

WANTED—Situation as a superintendent of fire brick works; understands every branch of the business; is reliable, practical, sober and industrious; highest references; competent to develop clay lands. Address **"EDMUND,"** Care Clay-Worker. 11 c

FOR SALE—\$1,500 will buy the brick plant at West Brattleboro, Vt. Chief machine, good clay; brick sell for \$6 at yard; house, barn, 4 acres land. Write for particulars to **E. S. MORSE**, Brattleboro, Vt., or **D. H. BOYD**, Brooklyn, N. Y. 11 3 cm

FOR SALE, CHEAP—Brick and tile factory, in Indianola, Warren county, Iowa, or brick machinery, boiler and engine will be sold separately. Present owners cannot handle it. Correspondence solicited. **BERGER**, Care of Clay-Worker. 12 2 c

FOR SALE—Two Simpson presses, one Plymouth brick and tile machine, Plymouth board delivery, brick cutting table, Plymouth tile cutting table, Freese "A Special" brick machine, Stevenson pug mill and Emens granulator. For description of this machinery see page 579, June Clay-Worker, or address **CLEVELAND VITRIFIED PRESSED BRICK CO.**, 899 Cuyahoga Building, Cleveland, O. 7 tf d

LUMBER AND BRICK DRYERS, MOST EXTENSIVE IN USE.

W. A. LEARY,

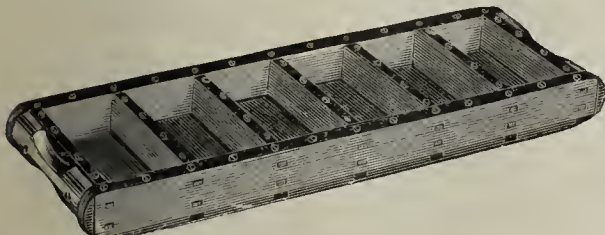
1103 H Street, N. W.

WASHINGTON, D. C.

HARDIN, BAILEY & CHURCH.

MANUFACTURERS OF

BRICK MOULDS



Don't fail to get our prices.

Of every kind and description. We make a specialty of Brick moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.

FREEPORT, IND.

Do You Want

CREDIT REPORTS on men who make BRICK, on men who buy BRICK, on men who sell BRICK? Trustworthy service at lowest prices; ordinarily \$1.00 for each report.

RELIABLE LIST of BRICK manufacturers and Supply men, in any State, in any Country? These can be furnished at small cost, usually \$1.00 for any single list.

ADVANCE REPORTS that are advance reports of all contemplated construction work calling for BRICK?

TO KNOW how to sell BRICK to the Government?

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, **ASSOCIATED TRADE & INDUSTRIAL PRESS**,

ESTABLISHED NINE YEARS.

Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

•••••

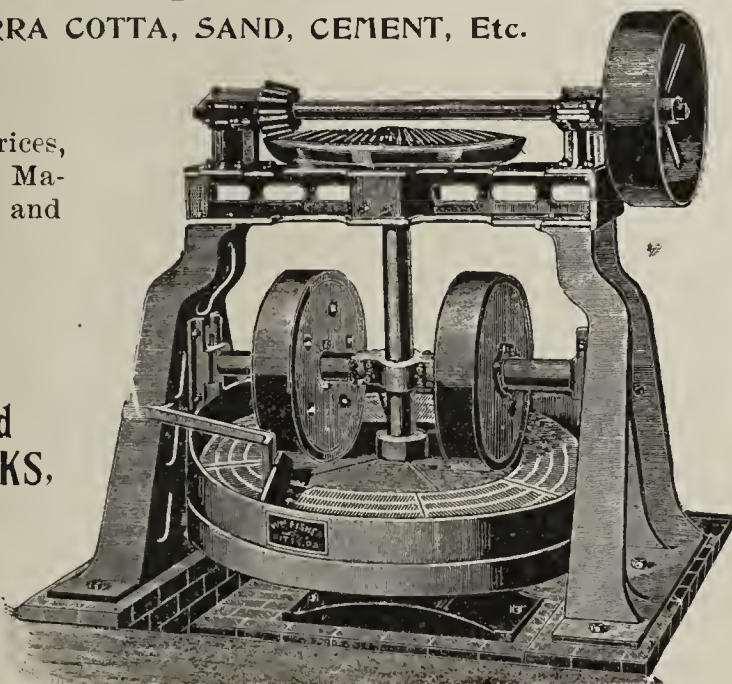
When writing for Prices, state kind of Clay or Material to be ground and capacity required.

•••••

FISHER ENGINE FOUNDRY and MACHINE WORKS,

Phillips & McLaren, Proprietors,

24th and Smallman Sts., PITTSBURG, PA.



WANTED—One good second-hand 2-mold stiff mud brick repress for standard size brick.

One second-hand pug mill, 14 feet long, for pugging fire clay for stiff mud brick.
65 double-deck brick dry cars, with flat floors.

1 hand-power side-cutting table for stiff mud brick. Address "E."
11 L Care Clay-Worker.

FOR SALE—4 second-hand boilers, 40 to 60-horse-power; 1 Chambers machine, 2 pug mills, 12 represses, 18 dump carts, 26 brick trucks, 28 brick wheelbarrows, 20 brick molds. Above goods are all second-hand, and will be sold cheap for cash. Inquire

CHICAGO HYDRAULIC-PRESS BRICK CO., Room 301 Chamber of Commerce Building,
15 d Chicago.

FOR SALE—3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.

8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, 1/4 screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
All new or little used, and in excellent condition.
12 d WALNUT, Care Clay-Worker.

WANTED—A situation as foreman or head burner of a common brick plant. I am thoroughly familiar with both the tempered and stiff clay processes. Understand fully how to erect and operate machinery. Familiar with both the up and down-draft kilns. Many years' experience. No bad habits. Best of testimonials from former employees. Have worked a large variety of clays, and never failed with any. Permanent situation desired. Address
111 p BOX 115, Care Clay-Worker.

TO BRICKMAKERS.

Do your kilns give satisfaction? If not, and you intend to remodel them or build new ones, please write to

GEORGE W. HOWES,
The Kiln Builder,
11 cm 508 Spruce St., St. Louis, Mo.

A RARE OPPORTUNITY

To buy a modern brick plant, newly fitted up. Cost, \$27,000. Good reason given for selling. Address GEO. W. SPARKS,
123 cm 209 North Williams Street, Moberly, Mo.

NOTICE.

Parties wishing formulas for the manufacture of enameled or glaze brick (once or twice burning), either on clay or burnt brick, with full instructions; also, pure white dull enamel, or other colors, for terra cotta, new process, can obtain same by inclosing five dollars. Parties ordering must state nature and quality of clay they wish to enamel or glaze. In such cases, if instructions sent are strictly followed, a guarantee given that results will be obtained equal to anything manufactured, or money refunded. Address
4 tf L EUREKA, care Clay-Worker.

THE CHEMISTRY OF POTTERY.

By Karl Langenbeck.

This book is written by a practical potter and chemist. It contains matter of great pecuniary value to every progressive potter, and is thoroughly up to date. Price, \$2.

We also publish:

"Chemistry for Beginners," by Edward Hart; \$1.50.

"Development of the Periodic Law," by F. P. Venable; \$2.50.

"Notes on Metallurgical Analysis," by N. W. Lord; \$1.25.

"Notes on Qualitative Analysis," by W. P. Mason; 80 cents.

"Engineering Chemistry," by T. B. Stillman; \$3.50. CHEMICAL PUB. CO.,
113 c Easton, Pa.

FAST TIME AND THROUGH SERVICE TO SOUTH BEND.

Commencing June 22, through parlor cars will be operated between Indianapolis and South Bend daily, except Sunday, on Big Four train No. 3, leaving Indianapolis at 5 p. m., making immediate connection with Vandalia line fast train at Colfax, which passes through Frankfort, Logansport, Lake Maxinkuckee and Plymouth, arriving at South Bend at 10:45 p. m. G. E. ROCKWELL, D. P. A., for details.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and....
MACHINE

MOULDS

We manufacture the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

F. H. C. MEY, Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

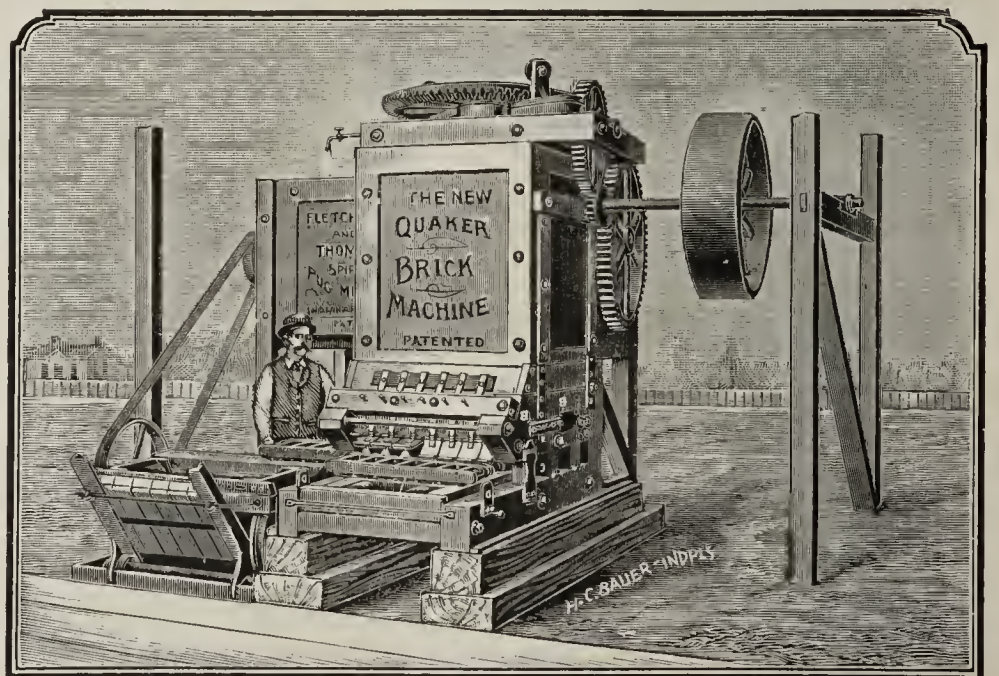
Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue.

Soft Mud Brick Machinery,

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sanding Machine, capacity 40,000 or more per day. We carry in stock a full line of first class brickyard supplies at a very reasonable price. Send for Catalogue.



J. W. HENSLEY.

General Agent,

Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

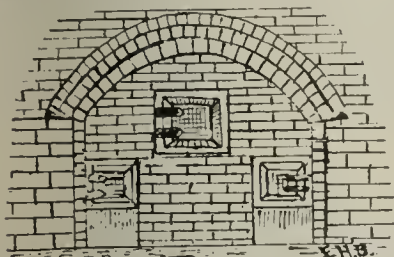
FIRE

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Bricks,
Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

Swift's Kiln Furnace,

CAN BE ATTACHED to any kind or style of Up or Down-Draft kiln. Nothing but slack or waste coal used from start to finish of burn. Fires not disturbed but once in 10 hours till watersmoke is off. Guaranteed to watersmoke dry press brick or the tenderest of clays or ware of any kind without damage. These furnaces can be seen in operation at my works at all seasons burning drain tile in winter and brick in Summer. It will pay you to investigate—I can save you good money.



F. E. Swift's Patent
Slack Coal Coker, Gas
Generator and Smoke Consumer.
 Washington, Iowa.

F. E. SWIFT, Washington, Iowa.

DEAR SIR:—In reply to yours of the 25th inst. I will say that I have burned our Eudaly kiln with your furnace attached four times, and have each time saved fifteen tons of coal over the other kilns of the same size containing one hundred thousand brick. In the others I used the best of lump coal and after raising the heat up to the highest point have to use wood in connection with the coal, so as to prevent clinkering. With your furnace I use slack entirely, and have no trouble and less work and less smoke. The greatest advantage of all is where I used to have several courses of checked brick in the other kilns, I now have my very best brick. I consider it the very best furnace in existence.

CARL NEIS,
 Supt. of Granite Paving Brick Works,
 Burlington, Ia.

F. E. SWIFT, Washington, Iowa.

DEAR SIR:—Yours of recent date at hand, on inquiry how I like your patent brick kiln furnace, will say, I have burned it 15 heats, and am well pleased with it, and find that I can burn my tile with eight tons of slack coal, as hard as I used to with 10 tons of lump coal in the old common fire boxes, which was, as you know, a plain hole in the wall, with short slanting grate bars. The tile does not crack as in the old kilns. There I had three courses cracked almost every one of them more or less, while in yours, I do not have any except by the door, if I do not get it tight enough. I must change my other kilns before I burn them any more.

I must say your furnaces are a "grand invention" and I need not wish you success, for all you have to do is to get them before the public.

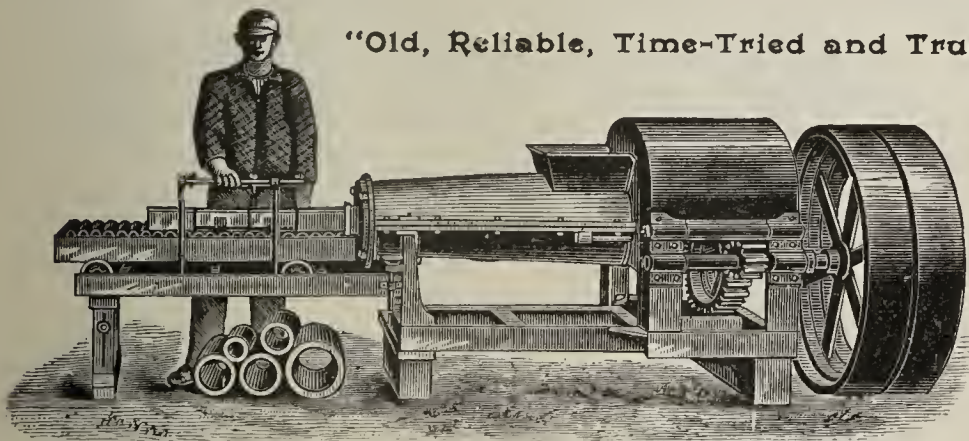
Yours respectfully,
 AUG. H. JOHNSON.

For further particulars, address

F. E. SWIFT, Washington, Iowa.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON, PARKHILL, ONTARIO,

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the NEW QUAKER BRICK MACHINE.

BRICK PROPERTY FOR SALE.

Consists of a farm on Staten Island, about one mile from Rossville, and on Fresh Kill, Staten Island Sound, sixteen miles from New York city, and containing 121½ acres, 103 of which is good farming land and 18½ salt meadow. Perhaps 90 or more acres of this property is composed of clay, red and blue, and is from 15 to 30 feet in depth, and in some places probably much deeper, the supply being practically inexhaustible. The red clay is of such a nature that no sand is required for manufacturing brick.

The present improvements consist of four frame dwellings, one frame barn and a large brick barn, a brickyard, in good and complete order, three circular pits and five machines on one side of brick engine house, all in good working order; two circular pits and three machines on the other side of engine house never have been used. Kiln shed, about 320 feet long, capable of holding 4,000,000 brick, and a wharf, about 250 feet long, capable of being increased to 1,000 feet at a small expense; 7 to 8 feet of water alongside. This property is most advantageously situated for the purpose desired. Its close proximity to New York enables the manufacturer to market the bricks later in the fall and earlier in the spring than can, in ordinary seasons, be done from any point on the Hudson river, which is the chief source of supply for the New York market. When the Hudson is closed the company's brick will bring from \$1 to \$2 per thousand more than in the summer, and this yard has for many years been worked for the supply of this very trade. Three million bricks were marketed in two weeks, from Feb. 25 to March 12, 1895, at \$6 per thousand, a dollar advance over price at close of navigation and a dollar above prices of Hudson river brick immediately after opening of navigation, March 15, 1895.

This plant could be changed for plant for making hollow brick, for which there seems to be an increasing demand, but nowhere is there such a brick property, with such advantageous facilities for shipping so near the best market in the country, New York and vicinity, as well as Newark and vicinity.

This property belonged to the late firm of Wood & Keenan. Both members of the firm being now deceased, the property is offered for sale. If not sold, will be rented. Apply to
 H. N. WOOD,
 122 d Haverstraw, N. Y.

PRESSED BRICK PLANT FOR SALE.

This Plant, located at Berlin, Conn., in one of the best brick-making centers in the country, on the main line of the New York, New Haven and Hartford Railroad, one hundred miles from New York, and very convenient to all New England points, will be sold very cheap to settle the estate of the late Edward P. Yale, who was President and principal owner of the Company. It is a splendidly equipped Plant. Buildings and Machinery almost new. The equipment consists of two four-mold Boyd Presses, Engine, Boilers, etc., two patent up and down draught Kilns, capacity of each, 200 M. Splendid Buildings and Sheds, including a fine brick office, and within a stones throw of the Railroad Station.

It may be unnecessary to speak of the Clay, as Berlin brick have a reputation second to none, and there is an unexhaustible supply on the property as well as a splendid Shale Quarry.

This is an exceptional chance for the right man. For further particulars address

F. H. ALLIS,
 New Britain, Conn.

The F. F. V. Vestibule Lim.
Chesapeake & Ohio R'y, is the only Solid
train with through Dining Car between
New York, Philadelphia, Baltimore,
Washington, Cincinnati and the West.
Lighted with Electricity. Heated with
Steam.

C. B. RYAN,
H. W. FULLER, Ass't Gen'l Pass. Agent.
Gen'l Pass. Agent, CINCINNATI, OHIO
WASHINGTON, D. C.

Architecture

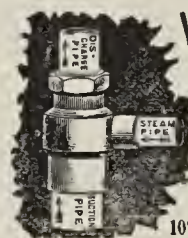
Architectural and
Mechanical Drawing:
Electricity; Mechan-
ics; Plumbing; Min-
ing; Civil Engineering
in all Branches;
Steam Engineering
(Loco., Stat'y and
Marine)

The International
Correspondence Schools



To Carpenters,

Machinists, Electrical
Workers, Plumbers,
Steam Fitters, Pattern
Makers, Steam Engi-
neers, Draughtsmen,
Miners, Civil Engi-
neers, etc. References
Everywhere. Free Cir-
cular. State Subject
you wish to Study.
Box 958, Scranton, Pa.



VANDUZEN STEAM PUMP
JET
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
Always in Order, never Clogs nor
freezes. Every Pump Guaranteed.
10 SIZES.
200 to 12000 Gallons per Hour.
Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, O.

Especially Prepared
BRICK MAKERS

Manganese,

POWDERED OR GRAIN.

For making colored and spotted brick and
also for mortar color.

SAMPLES AND PRICES ON REQUEST

KENDALL & FLICK,

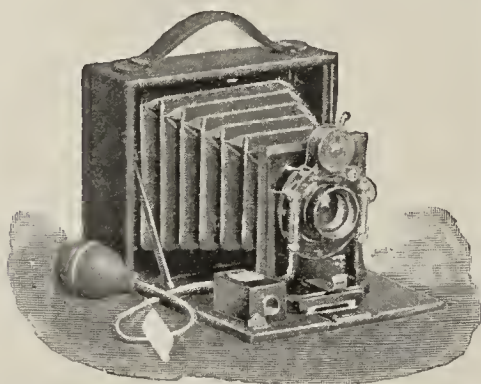
PRODUCERS AND GRINDERS,

MINES IN VIRGINIA.

Office 618 Penn. Ave. N. W., Washington, D. C.

Do You Enjoy Pictures?

And do you know you can make
excellent Photographs yourself
with a



Premo Camera

Light and compact, easily carried
and manipulated. The Premo is
the most popular Hand Camera in
the market.

ROCHESTER OPTICAL CO.,
ROCHESTER, N. Y.



Dean Bros. Steam Pump Works,

—* INDIANAPOLIS, IND. —*

SINGLE & DUPLEX PUMPS.
HORIZONTAL AND VERTICAL PUMPS.
Best Design & Workmanship.

PRICES REDUCED Send for CATALOGUE.

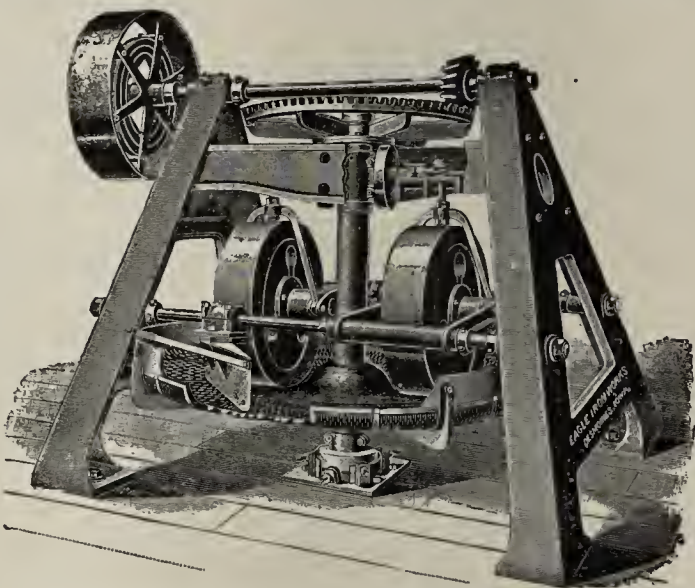
OUR NEW 9 Ft.

IRON FRAME DRY PAN

SEND for cata-
logue and read
up on our patented
features of this ma-
chine. Our motto
in its construction
and design is

"NOT HOW CHEAP.
BUT HOW GOOD."

EAGLE IRON WORKS, Des Moines, Ia.



BRICK MACHINES AND REPRESSES.

••••

THIS cut represents our Stiff Mud Brick
Machine. It will work any kind of
brick material including fire clay, shale or
common clay right from
bank without the use of a
pug mill. Each brick is
pressed separately and can
be haked 7 or 8 high, or
repressed right from ma-
chine.

Over 5'0 in operation.

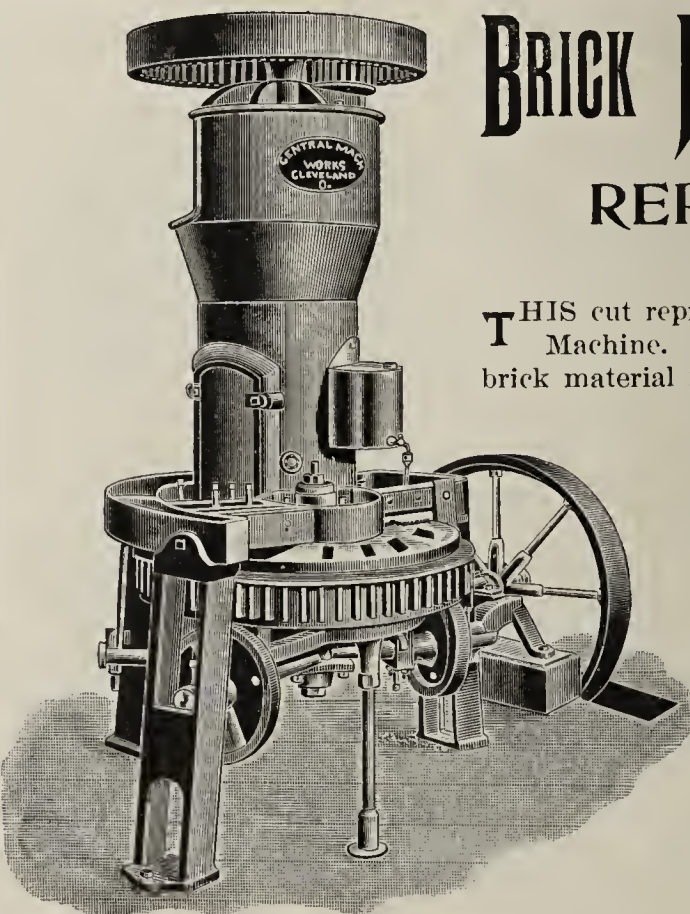
Send for price and circulars

Manufactured by

CENTRAL
MACHINE
WORKS,

226-236 Abbey St.

Cleveland, Ohio.



NOTICE—We furnish all supplies and repairs for any make of the
"Sword" Brick Machine.

DO NOT BUY A

FOUNDED 1879.

SOFT CLAY BRICK MACHINE

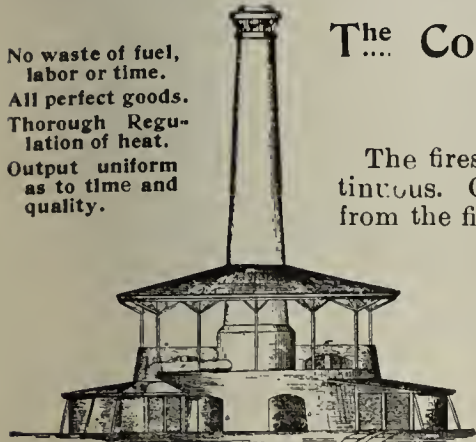
Until You Have Investigated Ours.

Send for Photo.

W. E. TALLCOT & CO., Croton-on-Hudson, N. Y.

NEW AND NOVEL,

No waste of fuel,
labor or time.
All perfect goods.
Thorough Regu-
lation of heat.
Output uniform
as to time and
quality.



The Columbian Pottery and Brick Kiln.

The fires remain in one division ONLY and are continuous. Goods move on a ROTATING FLOOR to and from the fires. Radiating heat and spare heat are used for drying and heating air for combustion.

A perfect and reliable factory Winter and Summer. Kiln and dryer combined. The best kiln for vitrifying Paving brick and glazing

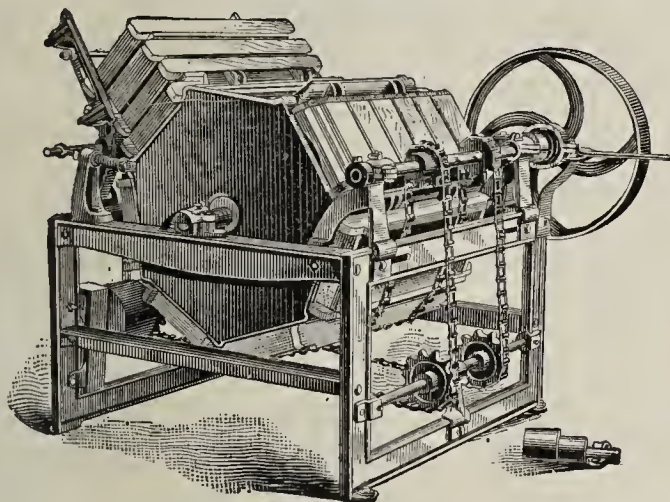
Full information on application.

COLUMBIAN POTTERY & BRICK KILN CO., Dexter B'd'g., 84 Adams St., CHICAGO, ILL.

CHAMPION Brick Mould SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and Serviceable.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, unless the Court grants a re-hearing of the case, or permission to go to the Supreme Court of the United States, a motion for which is pending and will be heard January 25th, 1897.

Only one patent No. 301,087 is involved in this decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 281,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit will be commenced at once on these patents against Buck and any persons purchasing from him or his agents.

4000 TO 5500

(Gallons of Water per hour.)

BY HAND-POWER.

Pumps, Hand-power Pumps.

(LOUD'S PATENT.)

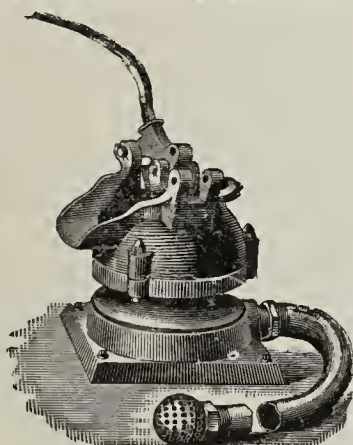
These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries or wherever it is desired to raise a large quantity of water by Hand-power. The pump has large valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



GEO. S. COX'S

Ready Made Cutting Wires,

Always give Satisfaction.

EAST LIVERPOOL, OHIO.

Send for Samples and Prices.

A. F. TENNILLE'S

Bureau of

News and Legislative Information,

Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,

35, 37 and 39 B St. N. W., WASHINGTON, D. C.

AN IMPROVED MUFFLED KILN

For Burning Terra Cotta, Fine Front Brick, Enameled Brick, Encaustic Tile, etc., etc.



WE have had many years' experience in building terra cotta, brick and tile kilns of different kinds, and can guarantee successful and satisfactory results, being practical kiln builders. Our terms are reasonable. Write for particulars, stating character and capacity of kilns desired.

F. HUNDT & CO.,

801 Dudley St., Chicago, Ill.

CINCINNATI SEWER PIPE CO.

(Successors to J. V. Nicolai.)

N. U. WALKER, Pres. | WM. NICKEL, Sec. & Treas.

Besides making Vitrified Stone sewer Pipe we manufacture and keep in stock a full line of

Fire Brick

— FOR —

Kiln Building & Boiler Setting.

Also Headquarters For

Cement, Lime, Plaster, Stoneware, Etc.

OFFICE & FACTORY: Cor. Elm & Water Sts.

CINCINNATI, OHIO.

THE IMPROVED Interlocking Brick, For Hollow Walls and Ventilating.

Send for pamphlet.

G. S. BALSLEY, 490 Howard Street, Detroit, Mich.

ALBANY SLIP CLAY.

We have a large bank of a superior quality of SLIP CLAY. Price very low by barrel or carload. Best of reference as to quality.

Address

JOHN H. JACKSON,
Successor to JACKSON BROS.,
ALBANY, N. Y.

N. Y. State Drain Tile and Pipe Works.
Established 1852.

GEORGE C. HICKS,

Consulting Engineer

In matters relating to the manufacture of Gas Retorts, Fire Brick, Terra Cotta Building Brick, Faience and other clay products.

Plans furnished for kilns and complete manufacturing plants, also system of bookkeeping to ascertain daily cost of manufacture.

Address by letter only

care FISKE, HOMES & CO.,
Boston, Mass.

Steubenville Foundry & Machine Works,

Established in 1820.

—Manufacturers of—

STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,

Making From 2 to 30-Inch
Pipe Inclusive.

Pipe, Brick, Tile, Coping,
Fire Proofing, and
Building Block Dies.

Clay Grinding and Tempering
Pans and Pug Mills.



FEED
SCREWS
FOR
MINING
CLAY.



STEAM ———
—— IN LINES
—— AND ———

Every Variety of Iron and Brass Castings,
Shafting and Pulleys.

Send for Circulars and Estimates.

JAS. MEANS & CO.,
Steubenville, Ohio.

NEW DISCOVERY KILN

Patented April 13, 1886, June
1888 Nov. 1891.

More Than 1,000 Now Stand as
Monuments of Fame to its Inventor

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what they say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
Marietta, Pa.

Chenoa, Ill.



Elevators

For handling
CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.

Also Furnish
RUBBER,
LEATHER,
COTTON
BELTING.



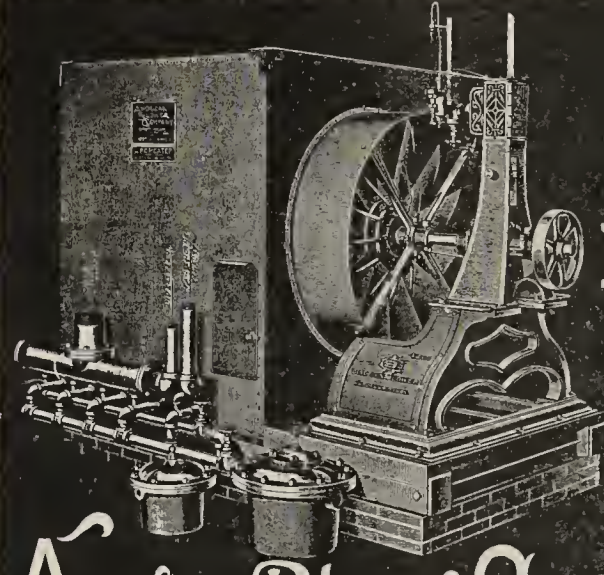
JEFFREY

Roller, Steel and Special CHAINS
—FOR—
**ELEVATING
CONVEYING
MACHINERY**
FOR HANDLING MATERIAL OF ALL KINDS.
Power Transmission Machinery.
COAL MINING MACHINERY.
WIRE CABLE
CONVEYORS.
For long and
short distance
conveying.

THE JEFFREY MFG. CO., Columbus, Ohio.
Send for Catalogue. 163 Washington St., New York.

Conveyors.

Manufacture
SHAFTING,
PULLEYS,
HANGERS,
GEARS,
CLUTCHES,
BUCKETS,
BOOTS,
BOLTS,
Etc. . . .



THE HOT BLAST APPARATUS

FOR
DRYING
BRICK
TILE AND
TERRA COTTA

American Blower Co
SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

SEND FOR CATALOGUE

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years. Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

INCORPORATED 1896.

CAPITAL \$100,000

National Fire Clay . . . Mining & Mfg. Co.,

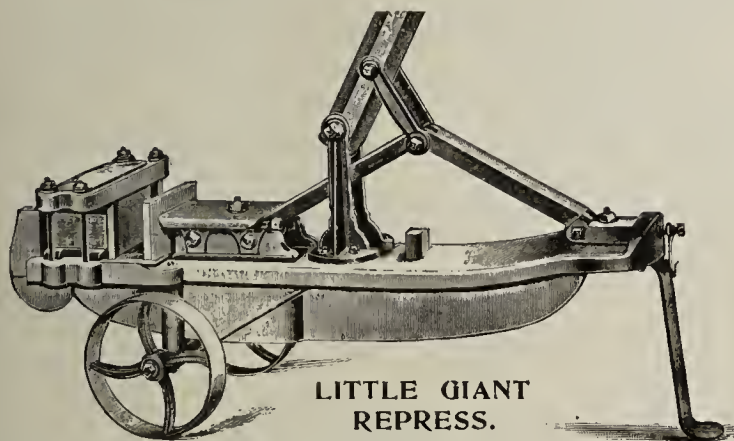
F. X. BARADA, President.
A. S. TAYON, V. P. and Manager.
A. S. BARADA, Secretary.

915 Chestnut St., ST. LOUIS, MO.

THE highest quality of Clay for Glass House Pots, Fire Brick, Tank and Furnace Blocks and all articles of Fire Clay used in the construction of Glass and Metallurgical Furnaces. Our XX Special Brick are absolutely indestructible and non-absorbing, specially adapted to smelting and refining furnaces and all furnaces and mills requiring high heat.

Read the analysis carefully and note that our clay is the superior of the imported article.

Silica.....	45.24
Alumina.....	39.31
Oxide Iron.....	.37
Lime.....	.29
Magnesia.....	.10
Alkalies.....	.27
Water.....	14.54
Total.....	100.12



LITTLE GIANT REPRESS.

ELI Auger Machine, Capacity 45,000 to 70,000.

ELI Jr. Auger Machine, Capacity 30,000 to 40,000.

LITTLE ELI Auger Machine, Capacity 15,000 to 20,000.

No. 1 A, Auger Machine, Capacity 25,000 to 35,000.

No. 2 B, Auger Machine, Capacity 12,000 to 20,000.

THE No. 1 A and No. 2 B Machines furnished with Square Hopper in place of Upright Pug Mill if desired.

DISINTEGRATORS, HORIZONTAL CONVEYORS,

GRANULATORS—SINGLE AND DOUBLE SHAFT,

UP-RIGHT PUG-MILLS, WINDING DRUMS,

BRICK TILE AND HOLLOW BLOCK TABLES.

TRUCKS, WHEELBARROWS, ETC.

Manufactured and fully warranted by

Michigan Brick and Tile Machine Co.,
MORENCI, MICH.

M. V. B. WAGONER'S

SLIP CLAY { For Glazing of Pottery } WORKS

ESTABLISHED 1845.

Clay in stock in any quantity, in barrels and bulk by the carload.

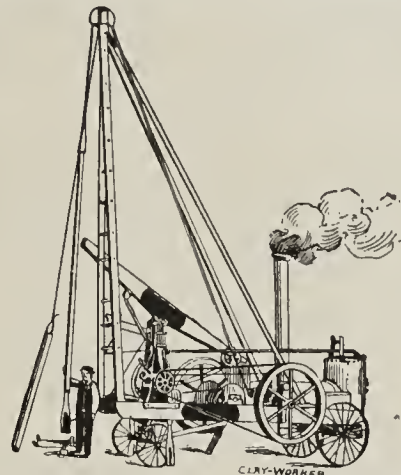
Office, 20 Ten Broeck St.,

ALBANY, N. Y.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,
PERTH AMBOY, N. J.

VANDALIA LINE

The Short Line for

ST. LOUIS AND THE WEST.

LEAVE INDIANAPOLIS,	AT TERRA HAUTE	AR. ST. LOUIS.
* 7:20 am	9:45 am	
* 8:15 am	10:00 am	3:24 pm
* 12:40 noon	2:30 pm	7:12 pm
* 7:05 pm	8:55 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am

*Daily.

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Tickets Offices, 48 West Washington St., 46 Jackson Place and Union Station.

GEO. E. ROCKWELL, Dis. Pass. Agt.

TAKE THE
BIG 4
TO
ST. LOUIS



Solid Train Between
Sandusky and Peoria
—AND—
INDIANAPOLIS and
MICHIGAN CITY,
FT. WAYNE and
CONNEERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger..... 7:00 a. m.
*No. 22 Passenger..... 1:20 p. m.
No. 24 Passenger..... 7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger..... 10:20 a. m.
No. 23 Passenger..... 2:50 p. m.
No. 25 Passenger..... 6:20 p. m.
*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on
A. H. SELLARS, Agent,
Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD and JACKSONVILLE, ILLINOIS.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express..... 8.30 a m
Accommodation..... 3.25 p m
Fast Express..... 11.20 p m

ARRIVE.

Fast Express..... 3.30 a m
Accommodation..... 10.40 a m
Mail and Express..... 4.50 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



Anyone sending a sketch and description may quickly ascertain, free, whether an invention is probably patentable. Communications strictly confidential. Oldest agency for securing patents in America. We have a Washington office. Patents taken through Munn & Co. receive special notice in the

SCIENTIFIC AMERICAN,

beautifully illustrated, largest circulation of any scientific journal, weekly, terms \$3.00 a year; \$1.50 six months. Specimen copies and HAND BOOK ON PATENTS sent free Address

MUNN & CO.,
361 Broadway, New York.

"LEVIATHAN."

"Upon Earth There is not His Like."

MAIN BELTING CO., 248 Randolph St., Chicago, Ill. Sept1896.

GENTLEMEN:—Please ship us via freight, 146 feet x 18" 8 ply "Leviathan" Belting. Thereason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Yours very truly,
Prompt shipment of the above will oblige.

Manufactured under Special Process.

A Guarantee of Superiority.

NOTE —By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum

MAIN BELTING COMPANY,

Sole Manufacturers LEVIATHAN BELTING,
248 Randolph St., CHICAGO, ILL.

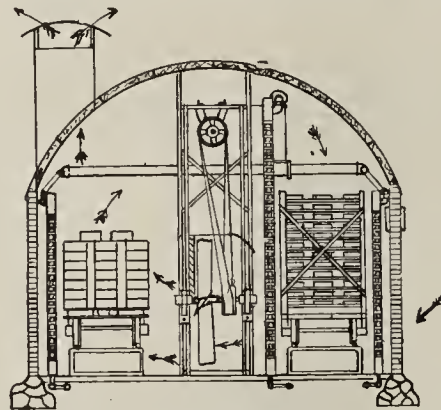
PHILADELPHIA: 1219 Carpenter Street.

BOSTON: 120 Pearl Street.

The Safety Dryer,

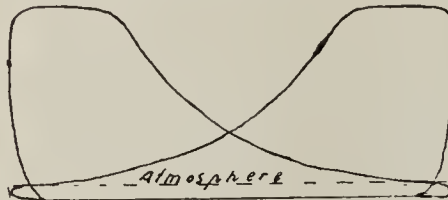
Made absolutely Fire Proof, at but little, or no greater cost than of wood erection. Much air at low temperature. Two tracks produce about as many thoroughly dried and "solid" brick as eight of other dryers.

Engine Exhaust Steam only, used for heating, much being employed, at no back pressure or extra cost for power, as the great circulation of air actually relieves the engine.



The INSIDE FAN DRYER.

U. S. Pat. Mar. 31, 1891. No. 449,170.
U. S. Pat. Mar. 31, 1891. No. 449,231.
British Pat. Mar. 31, 1891. No. 5,520.
Canadian Pat. May 30, 1892. No. 39,025.
Canadian Pat. May 30, 1892. No. 39,026.



"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.
MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,
CHAMBERS BROTHERS CO.,
J. H. Chambers, Gen'l Mgr.

SAMUEL ROSS,
President.

JOHN MILLER,
Treas. and Mgr

WASHINGTON BRICK AND TERRA COTTA CO.

WORKS:—Delaware Ave. and O St., S. W.
OFFICE:—Tenth and F Sts., N. W.

WASHINGTON, D. C., June 7th, 1895.

S. G. PHILLIPS, Esq., Rahway, N. J.

DEAR SIR—What will you change our 8 tracks steam dryer to your system for? I am so well pleased with the way your dryer works, that I am considering making the change as I can feel the difference in fuel between your dryer and our —
You have the best dryer in the market.

I am yours very truly,
JNO. MILLER.

Under date of July 5th, 1895, (another month of use) Mr. Miller also writes, "You have the best and most economical dryer I ever saw."

FORDS, N. J., April 9th, 1891.

MR. S. G. PHILLIPS,

DEAR SIR—I refer you to the indicator diagram showing a vacuum of 5 pounds. You can easily see that the fans will create a vacuum. The vacuum pump was not employed—neither did any cooling water assist to draw the exhaust steam through the pipes.

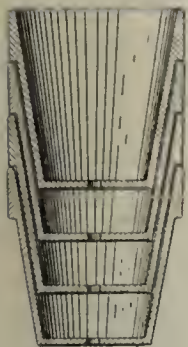
You may refer to me for full explanation.
I am yours very truly,
H. E. RAABE, M. E.

S. G. PHILLIPS

Agent and Patentee,

161 Grand Street.

— Rahway, N. J.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine.

(PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

INDIANAPOLIS, IND.



TO CHICAGO

THE WEST
and NORTHWEST



TIME TABLE IN EFFECT SEPT. 13.

3 DAILY TRAINS

LEAVE INDIANAPOLIS,

7:00 am, 3:35 pm, 12:55 Night

ARRIVE CHICAGO

12:00 Noon. 8:20 pm. 7:20 am.

Lv Chicago 2:45 am. 11:50 am. 8:58 pm.
Arr Indianapolis..... 7:45 am. 4:37 pm. 3:30 am.
Indianapolis Sleeper returns on 2:45 am. train.

SHORTEST AND FASTEST LINE.
LATEST EQUIPMENT.
ALWAYS "UP-TO-DATE."

TICKET OFFICES: 2 West Washington St.,
Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

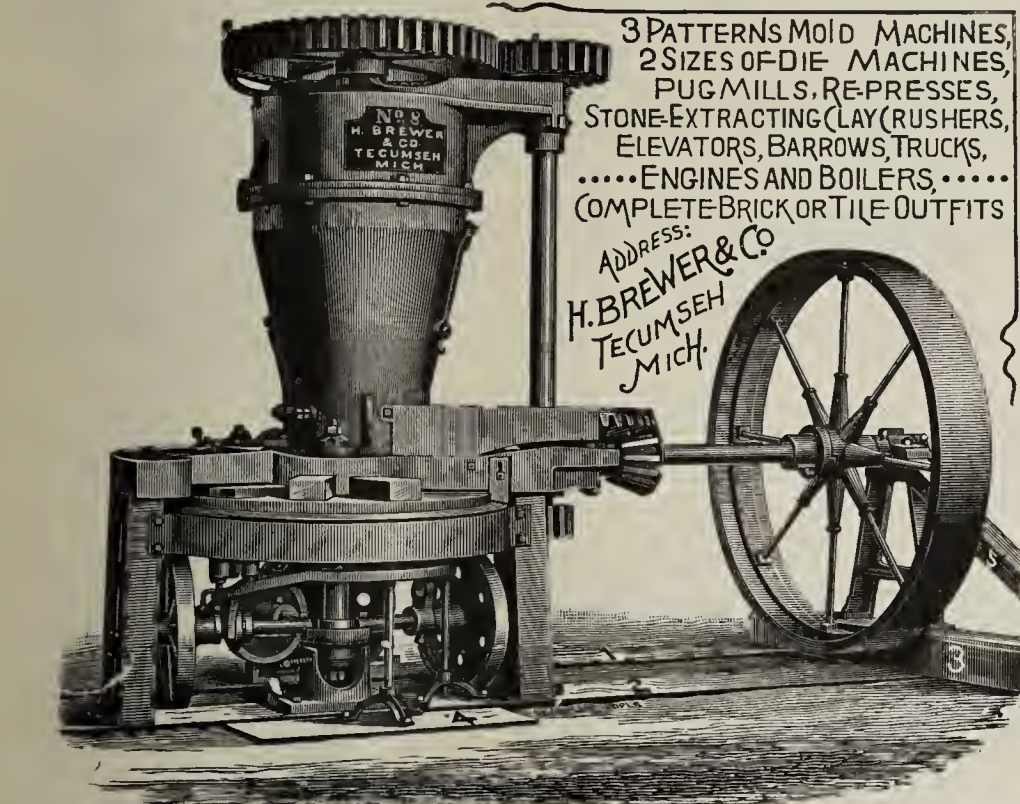
INTELLIGENT HELP OF ALL KINDS
MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns **WANTING INDUSTRIES**

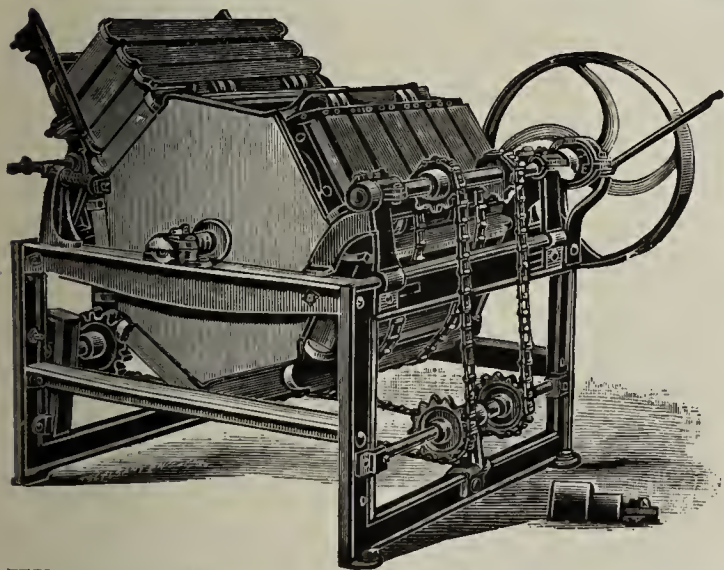
This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the North western States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.



BUCK'S NEW CHAMPION

Brick Mould Sanding Machine.



Judge Wallace's Decision.

[COPY.]

U. S. Circuit Court Southern District of New York.

ADDIE NEWTON } In
vs. } Equity.
WILLIAM W. RIDER }

This cause having come on to be heard this sixth day of April, 1895, upon argument of demurrer, and Mr. Walter E. Ward having been heard on the part of the plaintiff, and Mr. George A. Mosher on the part of the defendant, and due deliberation having been had, it is Ordered, adjudged and decreed that demurrer be sustained, and that the plaintiff's bill of complaint be dismissed with costs to the defendant to be taxed.

WM. J. WALLACE,
Circuit Judge.

THIS terminates the suit on patent No. 301,087 which Newton has so extensively advertised. It was defended by J. A. Buck without expense to Rider. Any interest which Newton may have had in this patent has since been sold at receiver's sale, April 30, 1895. The other patents relating to this machine had been previously sold January 21, 1892, at a similar sale. J. A. Buck now owns or controls all patents relating to this machine, and the trade is warned that so-called "Champion" machines made by other parties are infringements upon these patents.

J. A. BUCK, 76 Oneida St., Cohoes, N. Y.

WHITEHEAD BROS. & CO., General Agents, 517 West 15th St., New York City.

FRONT OR PRESSED BRICK AND VITRIFIED

Down-draft and Continuous combined.

All heat used twice at least.

Its Principal Advantages are:

- First: Saving of fuel.
- Second: Equalizing the drafts.
- Third: More perfect combustion.
- Fourth: Improved facilities for annealing.

Will save enough in the cost of fuel to make a handsome profit on the years work. The cost of kiln about the same as any well built down-draft kiln of equal capacity and durability.

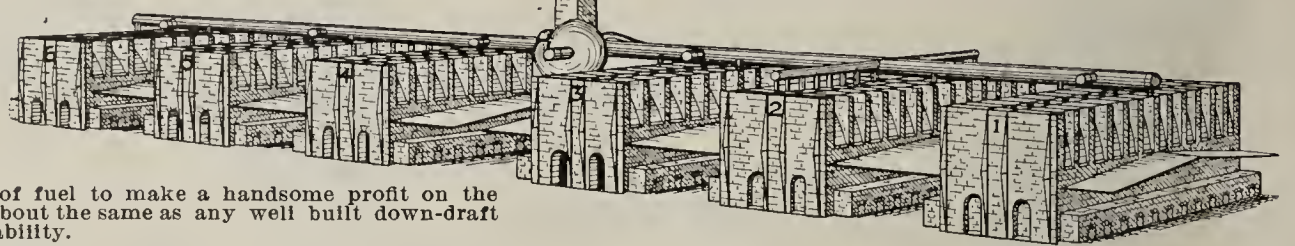
Can be Burned Cheapest

THE CALDWELL

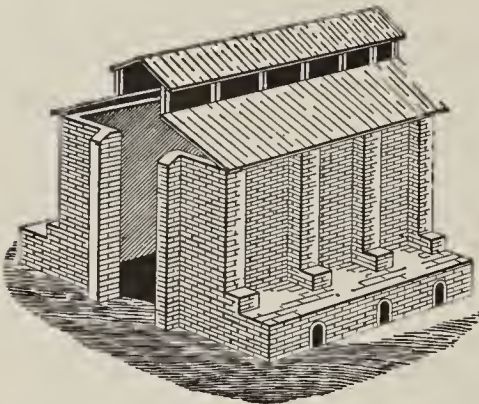
STREET-PAVING BRICK,

and Best in

PATENT KILN.



J. K. CALDWELL, 319 Hennepin Ave., Minneapolis, Minn.



Up-Draft Kiln.

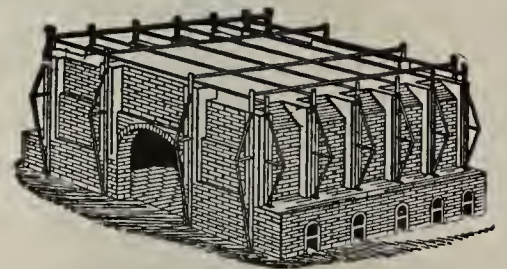
**LOUIS H. REPELL'S
IMPROVED-KILNS**

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be **THE BEST Up-Draft KILN IN THE MARKET.**
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

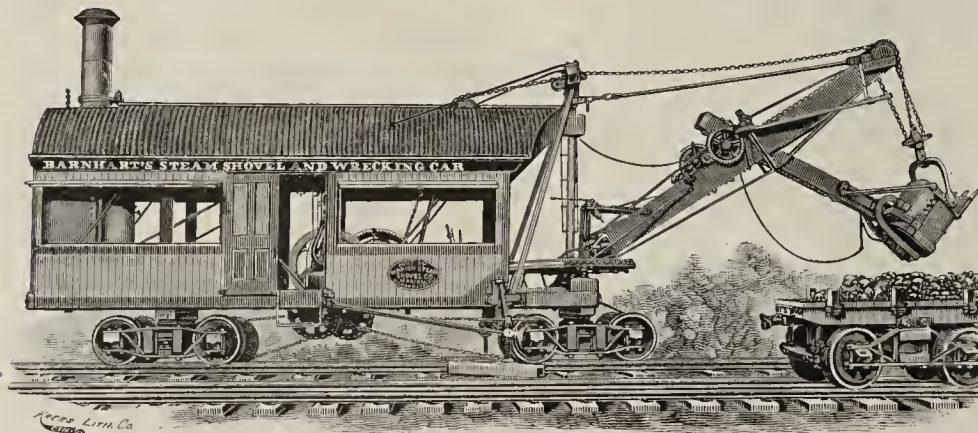
For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiln.

Steam Shovels for Brickyards.



STYLE A-1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**



STYLE C-¾ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

Progress.

IN ORDER to carry out more fully the plans and purposes with which we, under the firm name of W. D. Richardson & Co., entered upon the business of supplying the mechanical needs of our fellow brick-makers, we have secured a machine shop especially for our own use and have furnished it with entirely new and modern tools and appliances. We have also secured additional capital and more expert assistance in men who are skilled machinists and practical clay-workers. We have reorganized our company and been incorporated under the laws of the state of Ohio, as

The OHIO CERAMIC ENGINEERING COMPANY.

This name signifies what we aim to accomplish for the clayworking industries as engineers and machinists, as manufacturers of superior clayworking machinery and designers and builders of improved dryers and kilns. Realizing, as practical clayworkers of long experience, that no single type or form of machine or dryer, or kiln is adapted to all clays and conditions of manufacture it is our purpose, after careful investigation, to furnish or recommend such as will insure the best results in every special case. To do this we know that we must exercise skill and judgment as well as our own inventive faculties, and must practice such principles of honesty and integrity as will command the respect and confidence of all with whom we deal.

We are about to issue a new catalog showing the improvements which we have already in successful operation. We shall likewise from time to time bring to your notice in this journal such other improvements as we may be able to devise, and which we shall have tested in practice and proved to be of undoubted value. We invite all clayworkers who are seeking better facilities for turning out a better product to correspond with us. Let us know what difficulty you want to overcome or what good you want to accomplish and if we cannot help you our efforts shall cost you nothing.

With the compliments of the season, we are,

Respectfully yours,

The OHIO CERAMIC ENGINEERING CO.,

59-63 Center Street,

CLEVELAND, OHIO.

**ROPKEY
MASON
ENGRAVING CO.**

INDIANAPOLIS.

*THE BEST HALF-
TONES, ETCHINGS AND
WOOD CUTS, AS WELL AS THE
MOST ARTISTIC DESIGNS EVER USED BY
THE CLAY-WORKER WERE MADE BY THE
ROPKEY MASON ENG. CO.*

*Sincerely
Ed. Randall & Co.*



THIS KILN is cheap to construct, simple in operation and permanent in character. It has no crown to fall in and costs nothing for repairs. The dampers in the bottom give complete control of the heat and draft. It burns all brick evenly and thoroughly. It heats the brick gradually and cools the same, producing a tough and thoroughly annealed brick. It requires less than 200 lbs. slack coal per thousand to burn the very best annealed vitrified shale paving brick. It saves labor—one man can fire the largest kiln.

The Slack is converted into Gas and all the Heat Energy in the Coal is Utilized.

IT IS A SMOKE CONSUMER AND A PROFIT PRODUCER. ✦ YOU NEED THIS KILN. ✦ WRITE OUR GENERAL MANAGER FOR FULL INFORMATION.

ALSIP'S LATEST IMPROVED

Down and Up=draft Kiln.

The Alsip Kiln can be built so one smoke stack will accommodate two or more kilns.

The Alsip Kiln can be built with one small smoke stack.

The Alsip Kiln can be built with chimneys on the side of kiln.

The Alsip Kiln can watersmoke with the Up-draft.

The Alsip Kiln can watersmoke with the Down-draft.

The Alsip Kiln utilizes the waste heat from a cooling kiln for watersmoking a green kiln.

The Alsip Kiln uses furnaces with horizontal or slanting grate bars, also furnace without grate bars.

Any of the above styles of kiln guaranteed to give satisfaction.

We have a kiln that will convince and satisfy the most skeptical as to results of same if its merits are investigated.

For further information call at The Day Brick Works, or address

W. & S. H. ALSIP, 614 South Jackson Street. Belleville, Ill.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

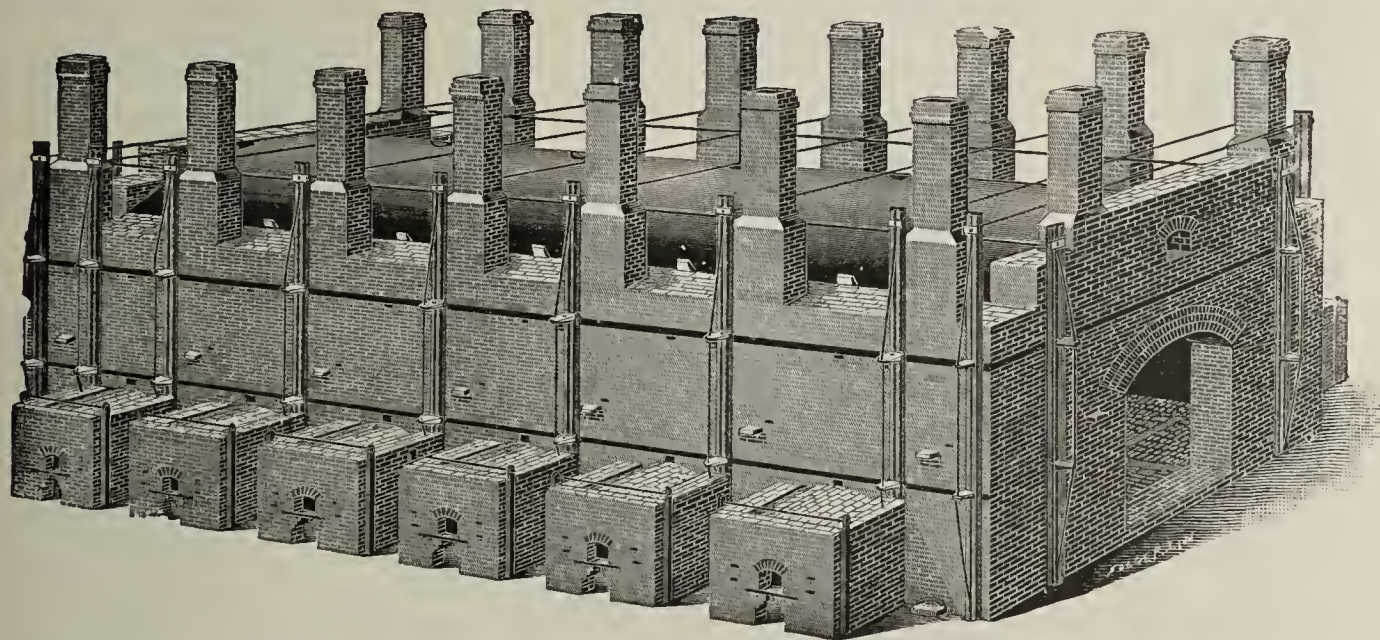
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

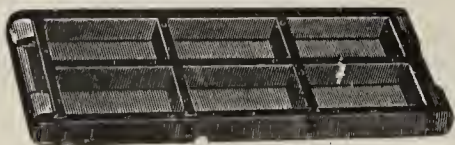
W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

ARNOLD'S

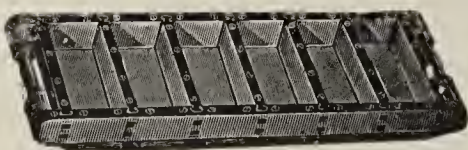
BRICKYARD SUPPLIES,
Are the Standard.



3 Brick Hand Mold.



6 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

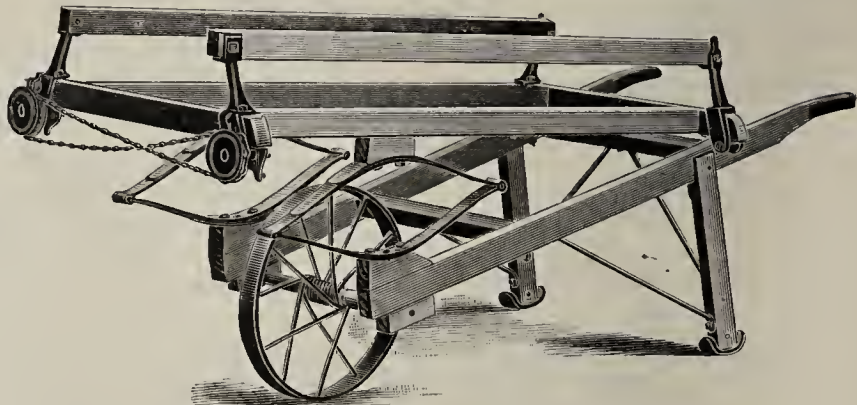
We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

Send for catalogue and price list. Address,
D. J. C. ARNOLD, New London, Ohio.

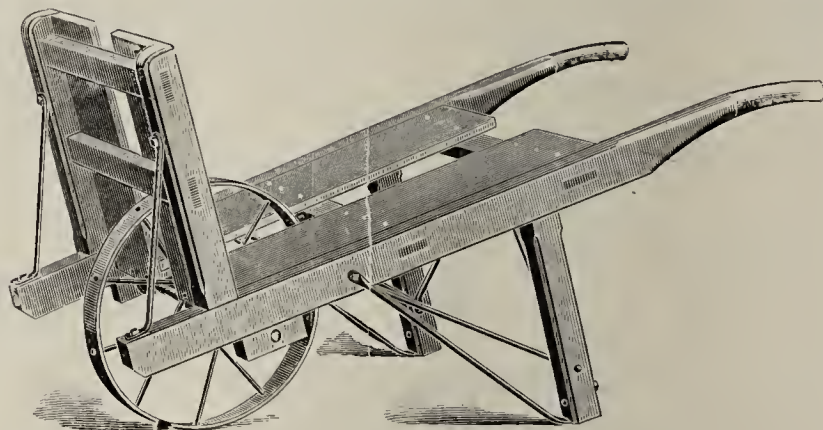
TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market.

BARROWS, For Various Purposes.

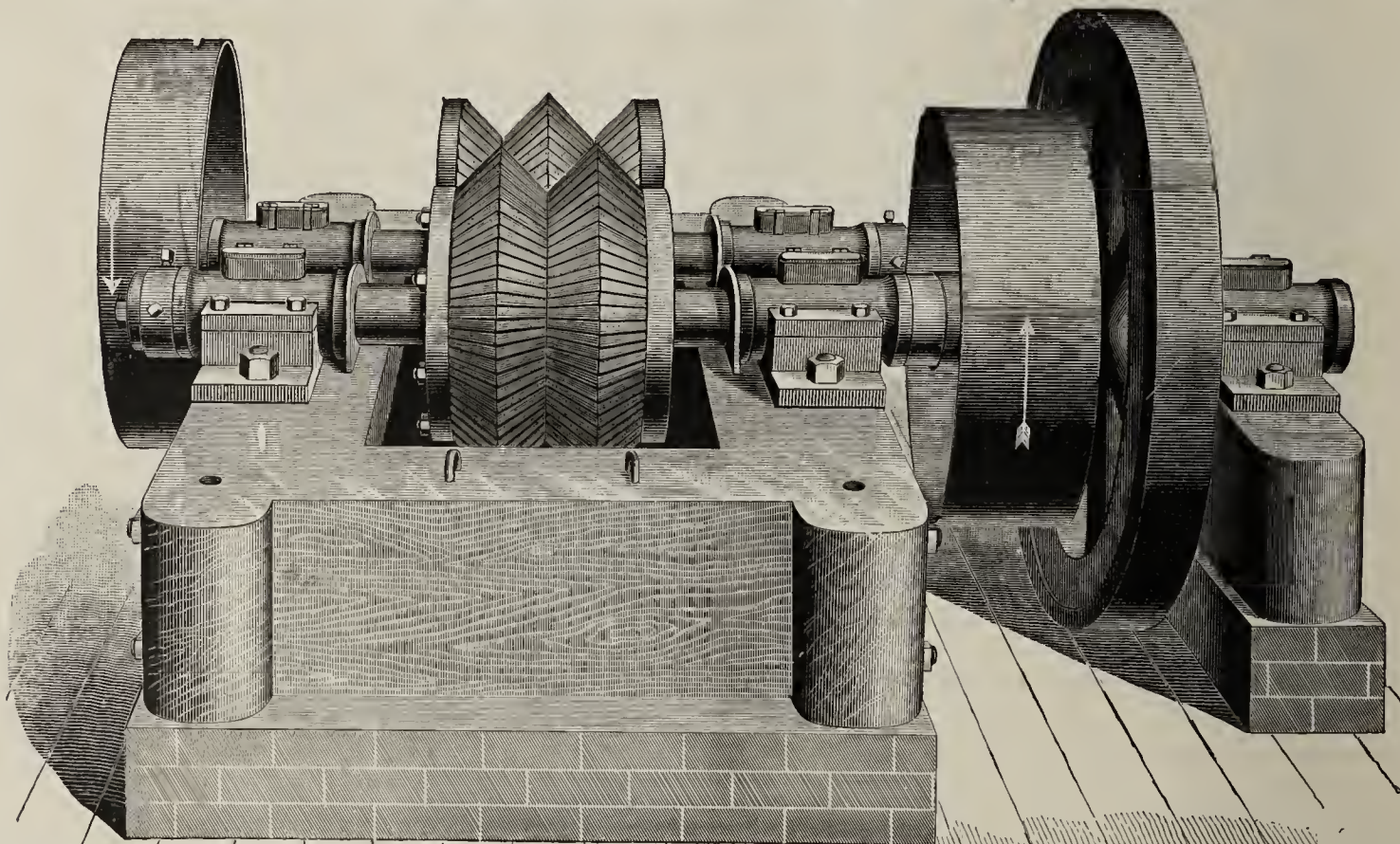
Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind.



No. 4 Brick Barrow.

NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building, New York, U. S. A.
26 Cortland and 21 Day Streets,

You Hardly Know Us Yet.

You will later. We're here for business, and we want yours. We looked all over the field to find the best Clay Working Machinery to handle.

SOFT CLAY—STIFF CLAY—DRY PRESS,
And we found it. We would like to tell you what we chose as the standard of each kind.

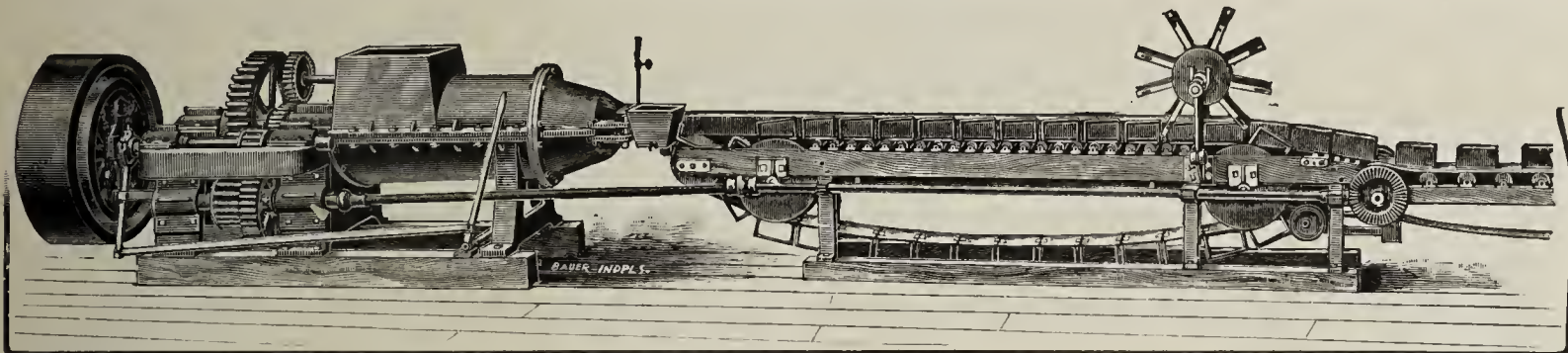
Can sell you second-hand machinery of all kinds. It isn't as handsome as new but makes just as good brick, and it costs a whole lot less.

Have you any second-hand machinery you want to sell or trade? Make us a price on it.

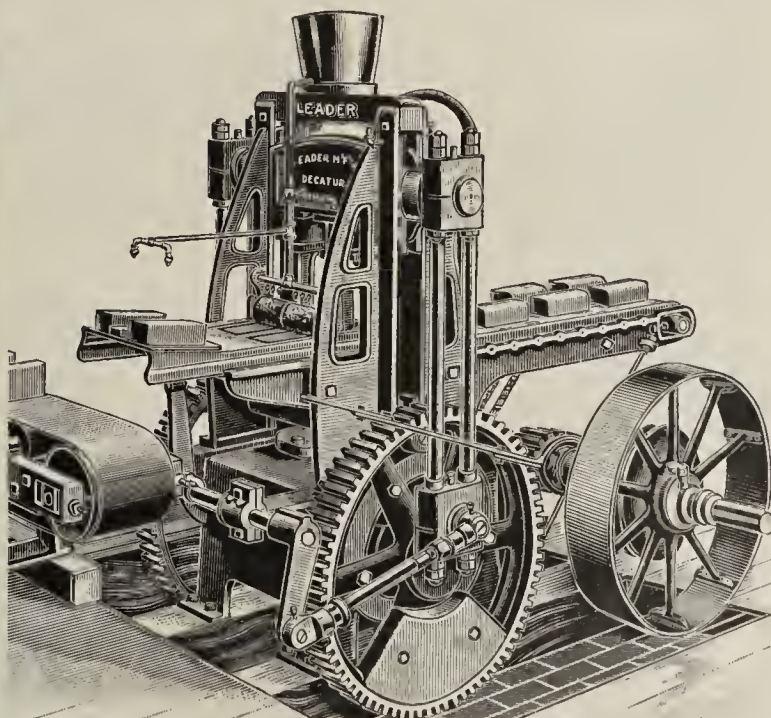
CHICAGO BRICK MACHINERY CO.

225 Dearborn Street.

CHICAGO.



LEADER
MANUFACTURING CO.
 DECATUR ILL.
 MANUFACTURERS OF
 BRICK MACHINES, BRICK PRESSES,
 PUG-MILLS, CRUSHERS
 DISINTEGRATORS, AUTOMATIC CUTTERS,
 + ELEVATORS +
 AND
 COMPLETE OUTFITS.
 SEND FOR PRINTED MATTER.



B RICK CARS.

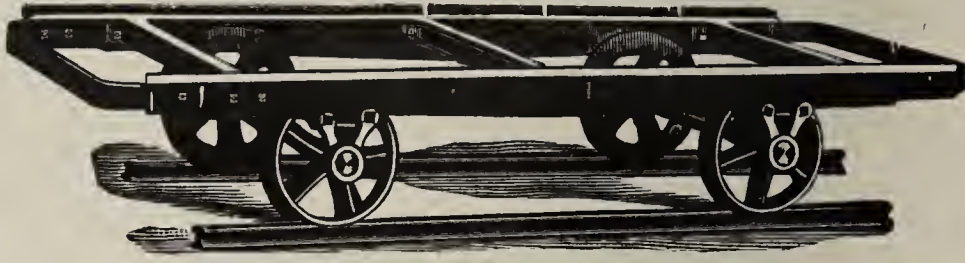
THE BEST. NO EXPERIMENT.

Thirty styles of our cars in use in all parts of the United States and Canada. Nearly 2000 of our cars are in use in Cleveland alone by the following Brickmakers:

F. H. Eggers,
C. G. Barkwell,
Standard Brick Co.,
Peter Cullen,
Collinwood Brick Co.,
Cleveland Brick Co.,
Canadian Copper Co.,
George Gynn,
Warren Farr,
John Cullen.

Write Them,
Then Us.

Catalogue and Price List sent on application.



Style 28.

WALWORTH RUN FOUNDRY CO., Cleveland, O.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

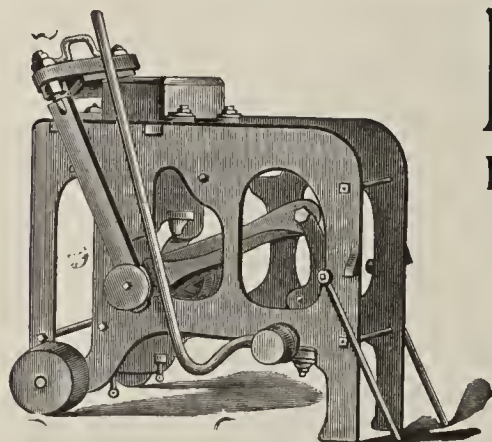
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

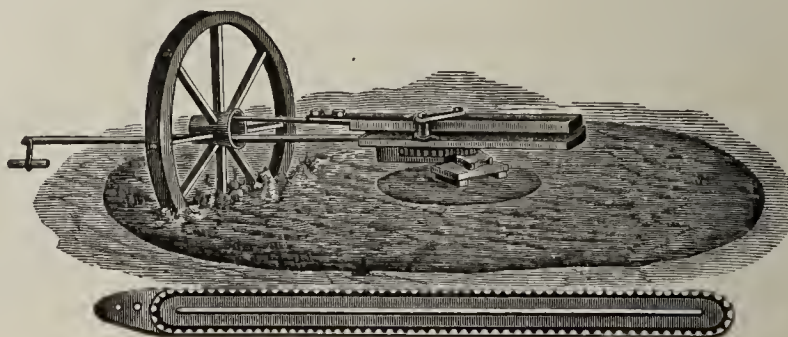
Send for Circular and Price-List.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

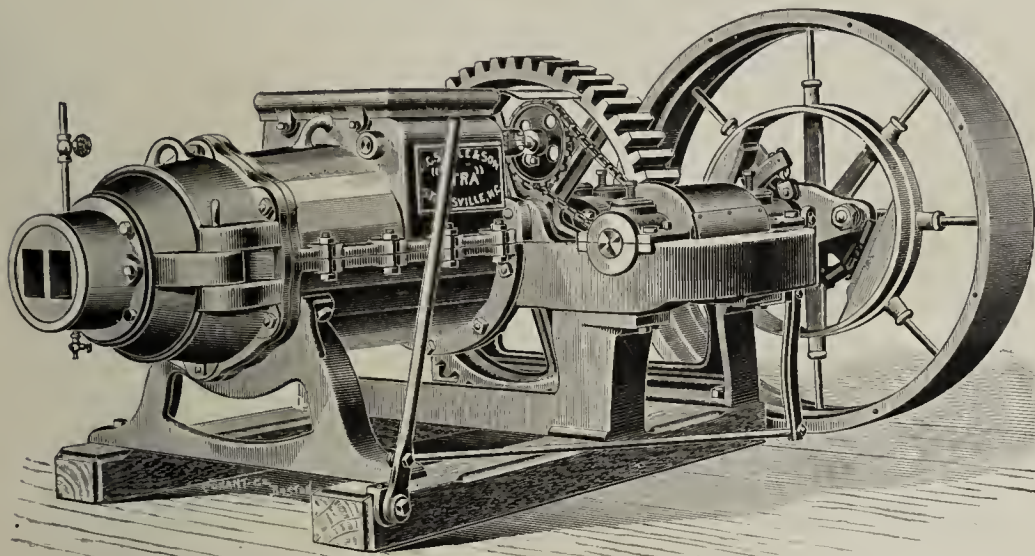
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The New South Brick Machinery



X-tra Machine. Capacity 25,000.

We don't claim the whole earth don't want it, but our machines make large quantities of it. They are always hungry, and are never troubled with digestion or constipation. No double bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dump Cars, Brick Trucks, Elevators.

DANVILLE, VA., Sept. 22, 1891.
J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Answering your query as to how we are pleased with the outfit furnished us by brick making machinery and implements, we say that it has given us good satisfaction. Our brick machine does all that you claimed for. The trucks are great labor saving implements and the winding drum and cars equally so. In our opinion we could hardly dispense with either the trucks and drums.

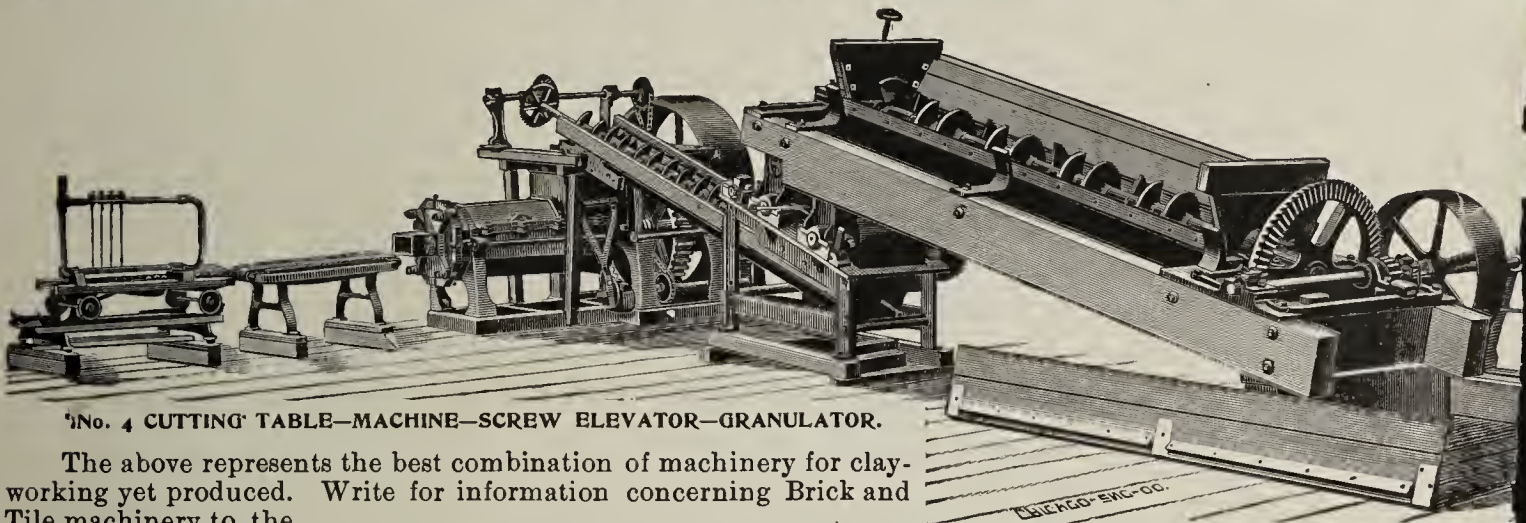
Respectfully,
DON VALLEY BRICK CO.

(This company is using the "X-tra" machine to make 30,000 brick per day.)

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

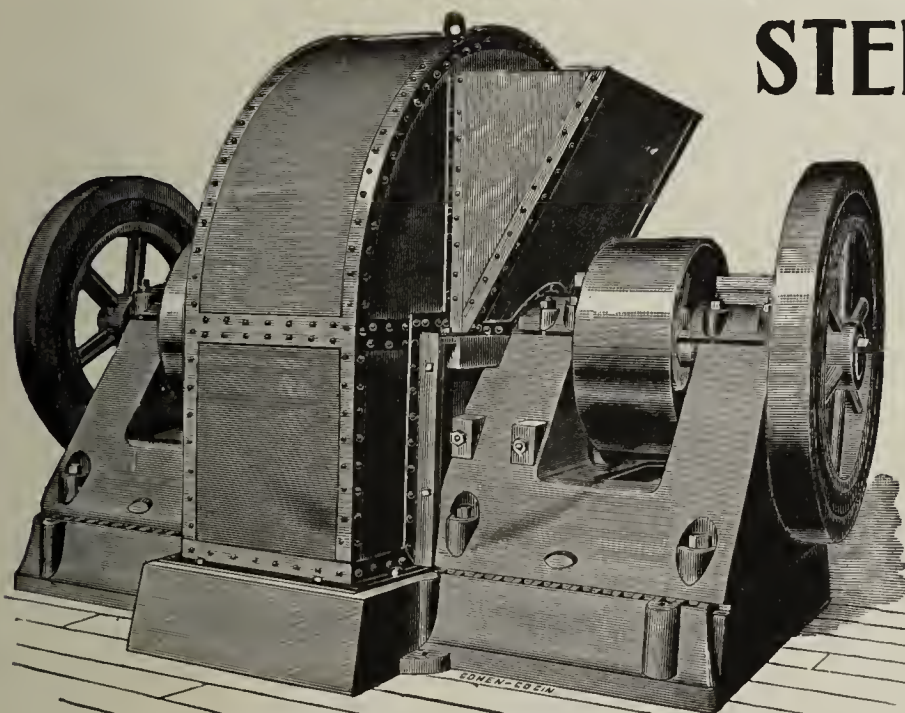
ADRIAN BRICK AND TILE MACHINE CO.



No. 4 CUTTING TABLE-MACHINE-SCREW ELEVATOR-GRANULATOR.

The above represents the best combination of machinery for clay-working yet produced. Write for information concerning Brick and Tile machinery to the

ADRIAN BRICK AND TILE MACHINE CO., Adrian, Michigan



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will operate in pulverizing damp clay, and the journals are constructed dust proof.

Write for catalogue, giving full details, references and testimonials. Address,

Stedman's Foundry & Machine Works

Aurora, Ill.

Clayworkers, Greeting:

IN COMMON with all manufacturers in this "Land of the Free" we gladly say goodbye to 1896, which has been a year of inactivity and tribulation to most of us, and turn hopefully to '97, which, if we read the signs aright, is to again start us on the road to universal prosperity. Already the building and allied industries are awakening and it behooves us one and all to brush away the cobwebs of old times and break away from the leisurely habits that one naturally acquires during slack seasons, or, as the boys say, "get a move on us," and make the most of the good times coming.

We are ready for business, our factory being better equipped in all departments than ever before for the production of the very best clayworking machinery that long years of experience and the most modern methods suggest, and if you want the best and most durable machinery and appliances that skill and ingenuity can produce, let us share with you.

Our line of Steam Presses for sewer pipe, drain tile, hollow brick and paving brick, is complete. Our special and patented Combination Pans, for grinding, are the outcome of many years of experience and experimenting. By attention given to the requirements of the working of clays to thoroughly grind and mix clay for a perfectly homogeneous body, the old style Chaser mills can be replaced, only in one way, by using our Combination Mill, which brings out the special feature of reciprocating wheels of the chaser, mounted upon a moving bed. Doubtless the matter of saving coal has been a study to many, and a machine that will save actual H.-P., and bring same results, would be looked upon with favor. For instance the ordinary 7 foot wet pan, 2 wheels, to grind stock, requires 35 H.-P. Should the pan be required to drag 4 wheels instead of 2, the H.-P. required would be greater as a natural consequence. Our 9 foot Combination Pan, 2 reciprocating wheels, will prepare more clay, in better shape with less actual H.-P. applied than any pan on the market. It has passed the experimental stage, and we offer it to the public as a sure good thing—complete in design and detail.

We also produce a special line of machines for making goods required by steel works, Silica Brick, Sleeves and Nozzles, also Tuyeres for Converters, Hex-blocks, etc., etc. These machines are being used by some of the first-class fire brick people in this country and around Pittsburgh, Pa.

We also have a line of Pottery Machinery, for either washed or ground clay. Our Potter Wheels and Jollies are of latest design and complete in every detail.

We have the only Steam and Belt Combined Flower Pot Machine on the market. Our Roofing Tile Press is designed to make diamond, flat and round end shingles, various shapes, and special arranged tile. We also furnish machines to form slabs and ridge tile.

We are pleased to make estimates of plants, either complete or in part. We furnish plans for Factories for Sewer Pipe, Brick Yards and Potteries; also foundation plans for all machinery. Send for catalogue and prices, and any questions relating to our machines we willingly answer to the best of our ability.

Thanking our many friends and patrons for favors in the past, and by our improved machinery hoping to merit a continuance of same, we beg to remain, very truly yours,

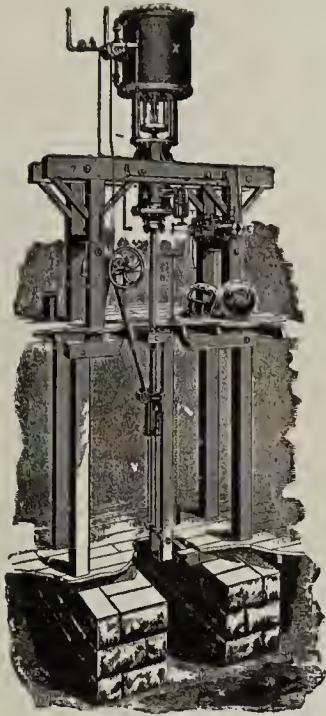
THE TURNER, VAUGHN & TAYLOR CO.,

Ma Falls, Ohio, January 1, 1897

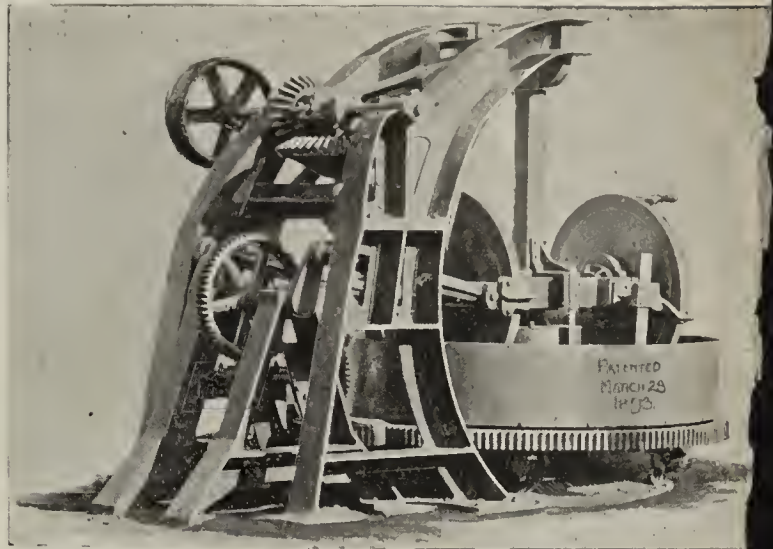
Per S. W. VAUGHN, Pres. and Treas.



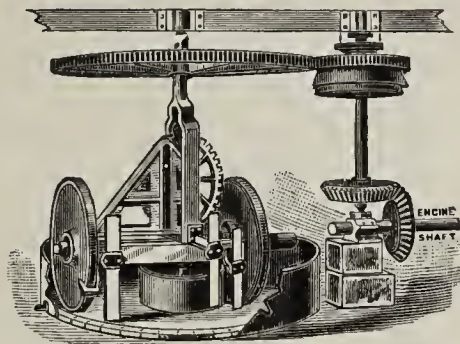
All Iron and Steel Jolly No. 3.



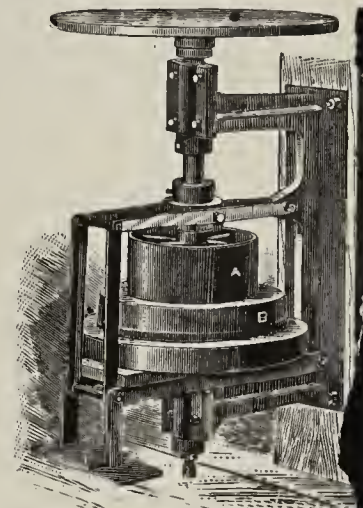
Vaughn Press.



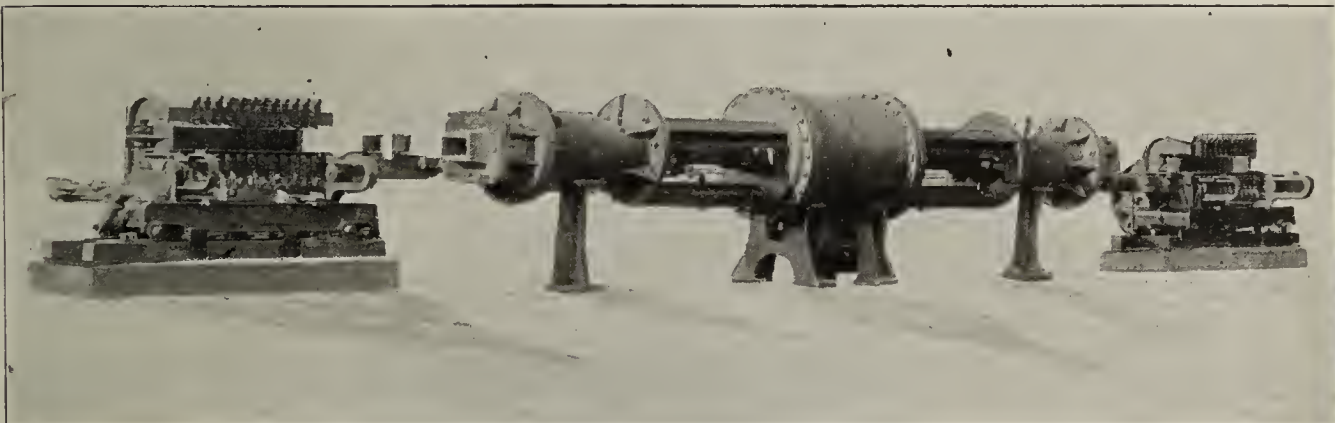
Combination Mill No. 2.



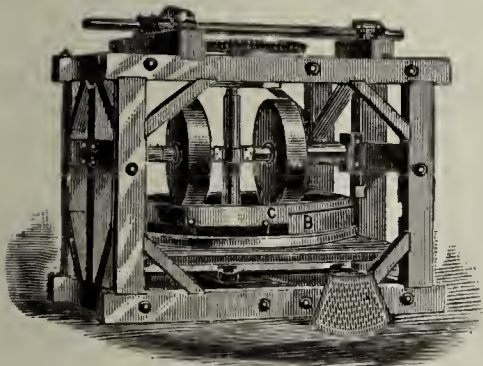
Clay Mill—Harp Pattern.



Potter's Wheel.



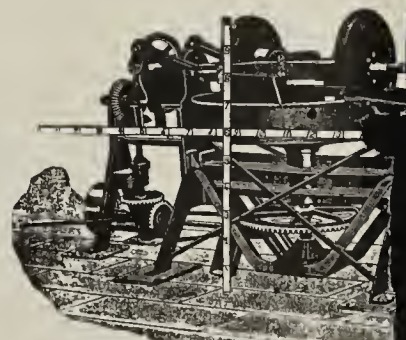
The "Cuyahoga" Double-Acting Direct Steam Pressure Brick Press No. 1.



Dry Pan.

IF you want any kind of Clayworking Machinery or device get our prices.

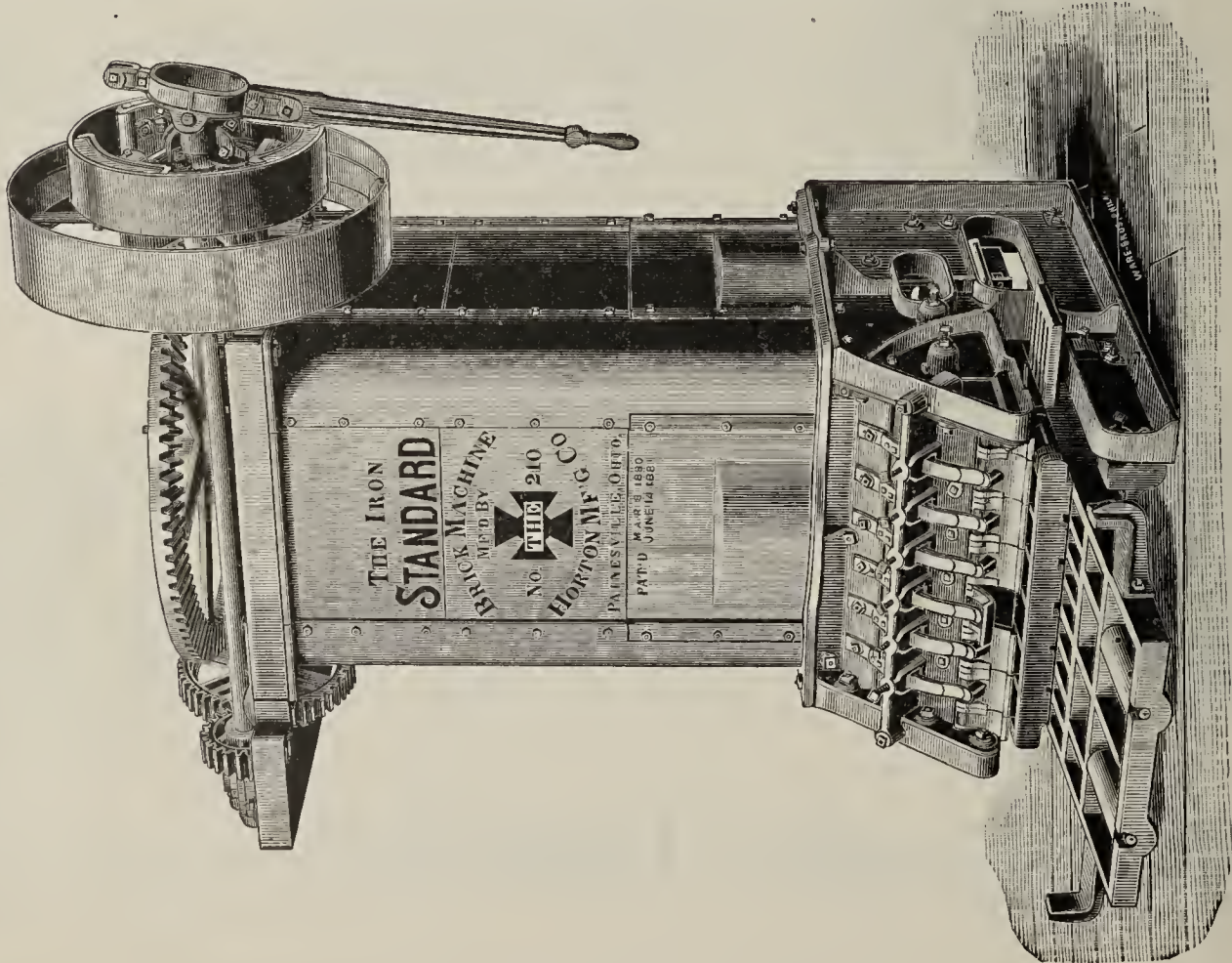
Catalogue Free.



"Cuyahoga" Combination

Turner, Vaughn & Taylor Co., Cuyahoga Falls

To be Found in our New "IRON STANDARD."



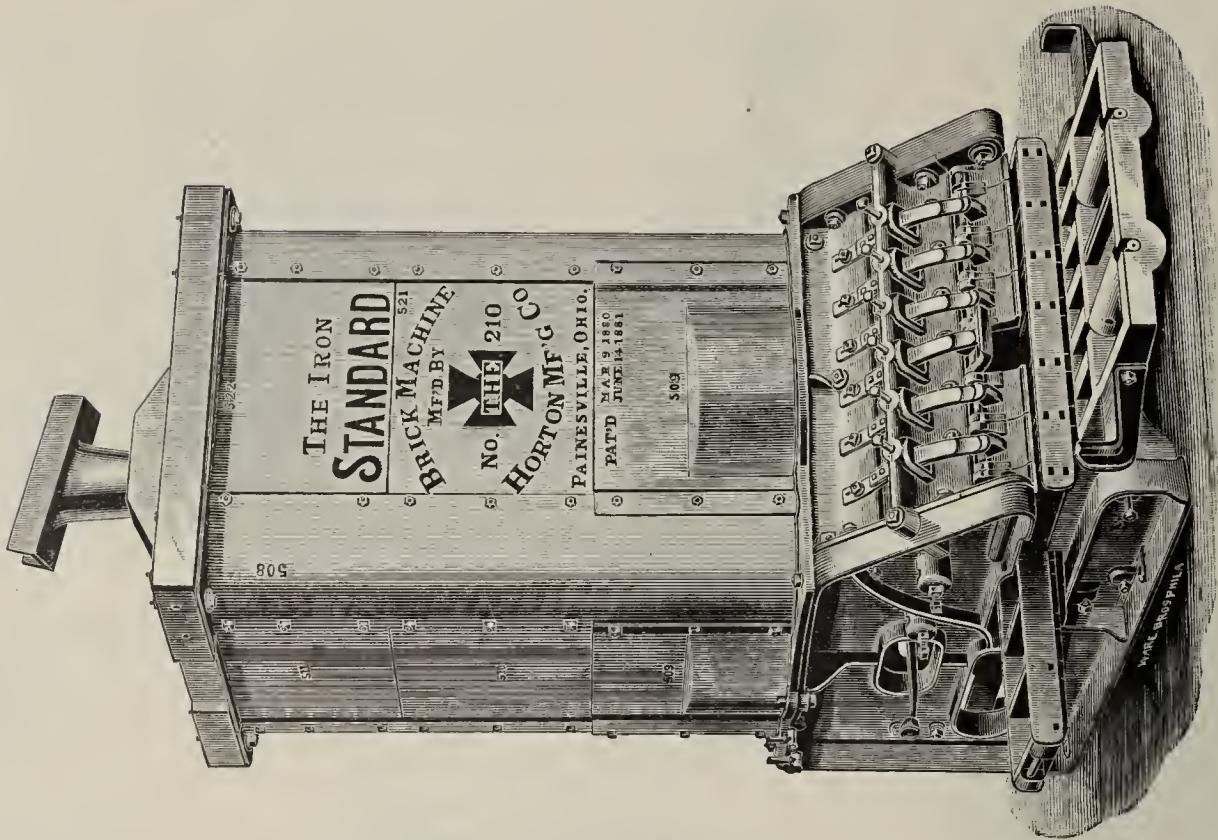
PRICES
ALWAYS
TELL.



• We are now making a strictly Iron and Steel Machine, not even the sills are made of wood. It is not only one of the best working machines but one of the nicest looking machines on the market.

• If in need of a Pug Mill, Disintegrator, Conveyor, etc., write us for rock bottom prices.

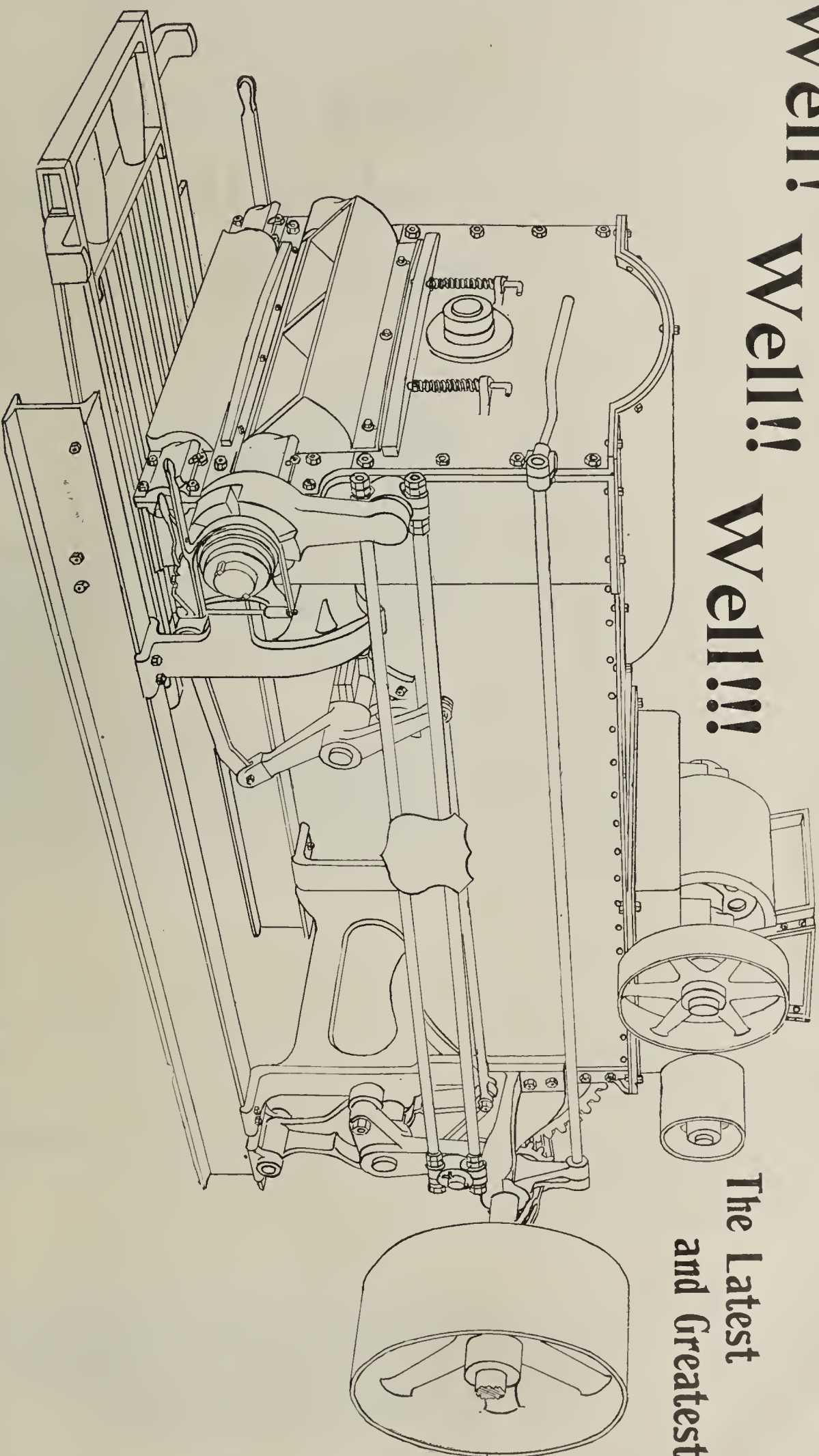
SEE A COPY
OF OUR NEW
CATALOGUE.



THE HORTON MANUFACTURING CO., = Painesville, Ohio.

Well! Well!! Well!!!

**The Latest
and Greatest.**



Only Four Gears in Entire Machine.

The Simplest, Strongest and most durable, greater Pugging and Grinding Capacity, will make more and better brick than any other brick machine made. For full particulars write

THE ANDERSON FOUNDRY AND MACHINE WORKS,

Anderson, Indiana.

Manufacturers of Steam and Horse Power Brick and Tile Machines, Pug Mills, Disintegrators, Elevators, Molds, Trucks and Barrows, Engines and Boilers.

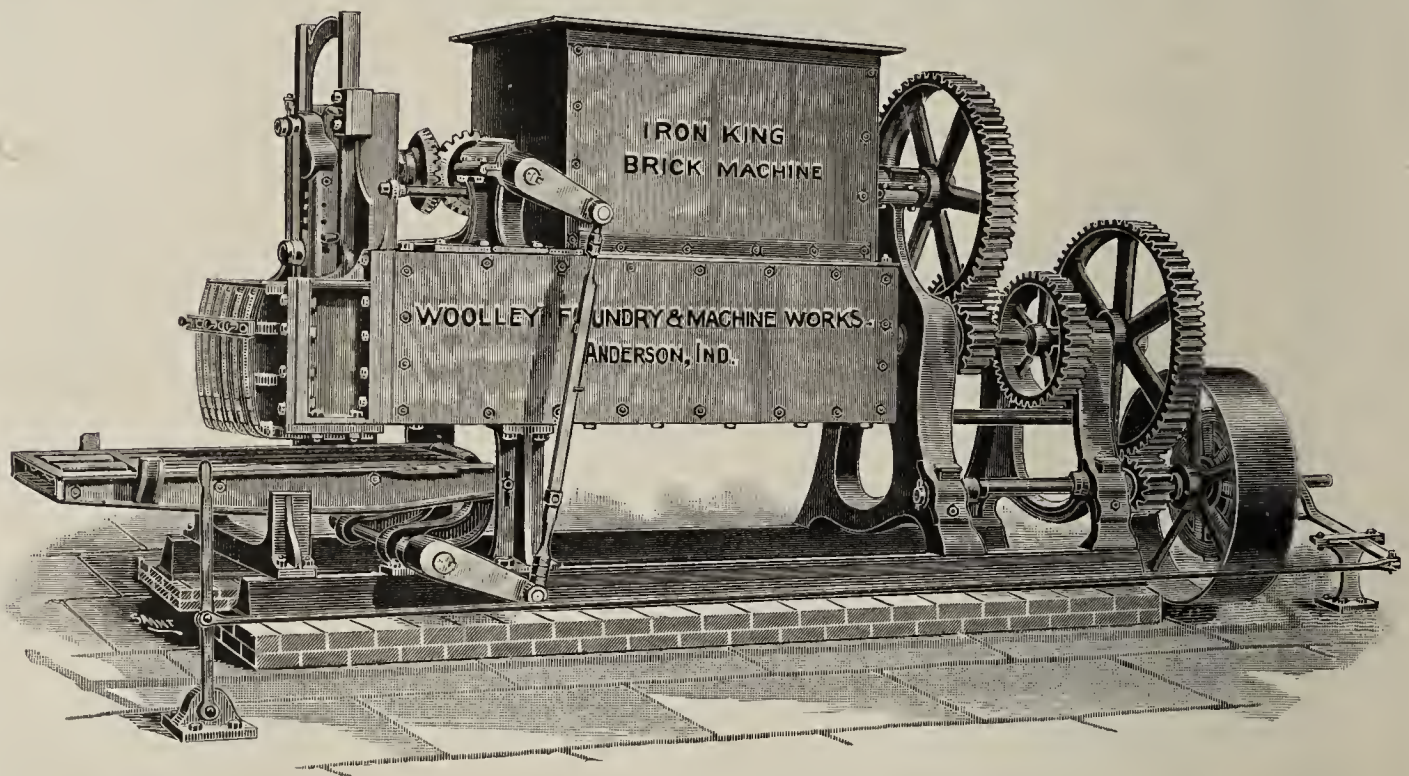
Do You Want A BRICK MACHINE A DRY PAN A PUG MILL?

IF SO, BE SURE AND LOOK INTO THE MERITS OF

The Iron King A BRICK MACHINE that has never made a failure.

The Woolley Dry Pan, The Woolley Pug Mill,

•→ All of these Machines have proven equal to any and Superior to most on the Market. ←•

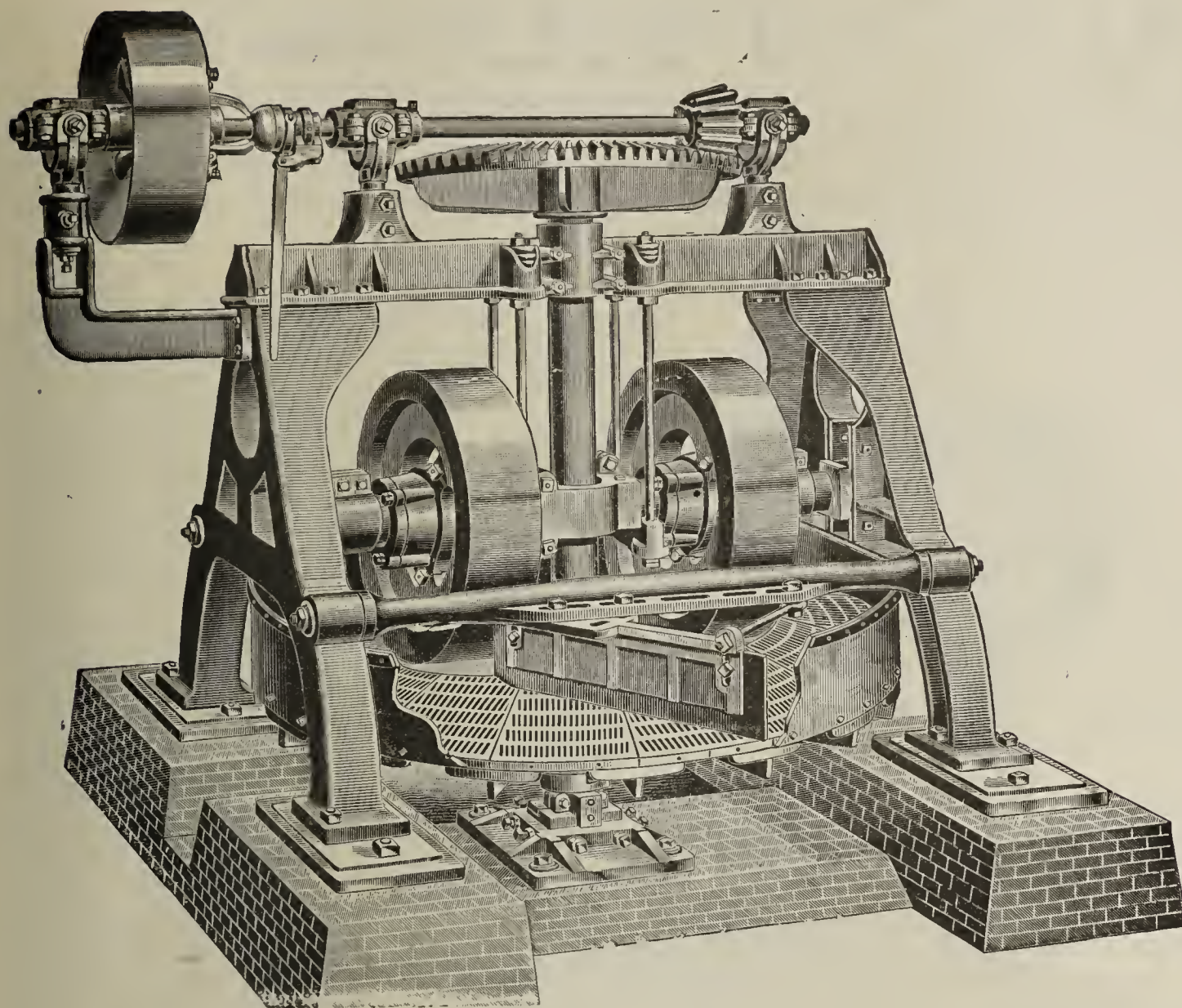


THIS is a non-breakable machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ability of every part.

We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

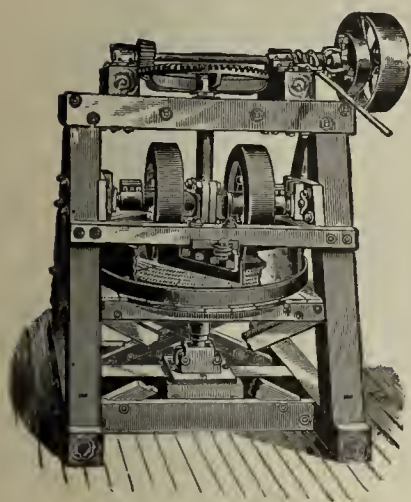
It will afford us pleasure to quote you prices.





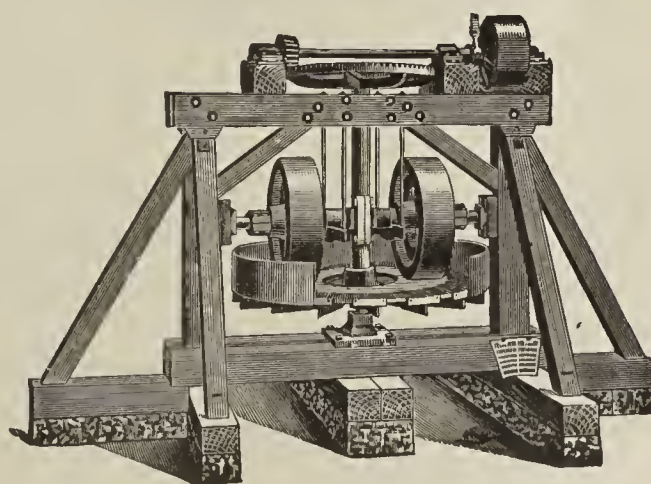
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,
WOOD FRAMES.

~~~~~  
All Sizes and Price  
to suit  
Any Size Plant.  
~~~~~

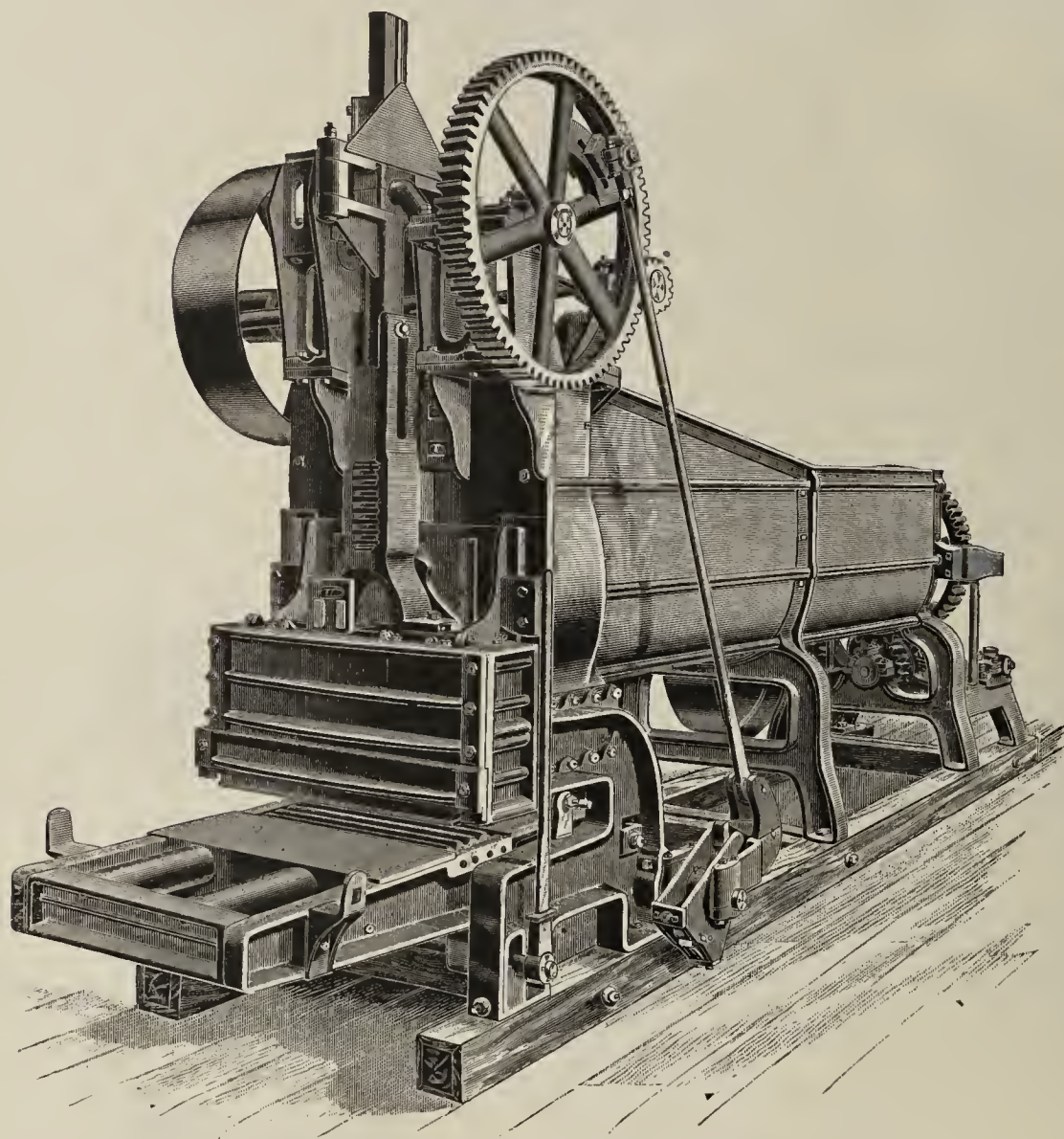


.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.

WANTED:—

Every Brickmaker to read this letter, and write us giving his opinion of a Machine that will make 40 M good brick every day in the year.



All Iron Horizontal Stock.

Geo. B. Parry, Pres.
MECHANICVILLE BRICK COMPANY,
High Grade Building Brick.
Capacity 10 Million.

A. D. Cady, Treas.

MECHANICVILLE, N. Y., Sept. 7, 1896.

C. & A. Potts & Co., Indianapolis, Ind.

GENTLEMEN:—The machines purchased of you two years ago are doing good work, having run every working day since the 10th of April and made its full compliment of 40 M brick every day since that time, having made in all over five million to the present time. **Good Record do you not think?**

Yours truly,
MECHANICVILLE BRICK CO.

WE DON'T THINK, but know, that this machine is a **Record Breaker**, that there is no machine made that will compare with it for Strength, Durability and Workmanship. For Quantity and Quality of brick made it is head and shoulders over all competitors.

We manufacture a complete line of Clayworking Machinery, Disintegrators, Mould Sander, Pug Mills, Elevators, Moulds, Trucks and Barrows.

Write us for Prices.

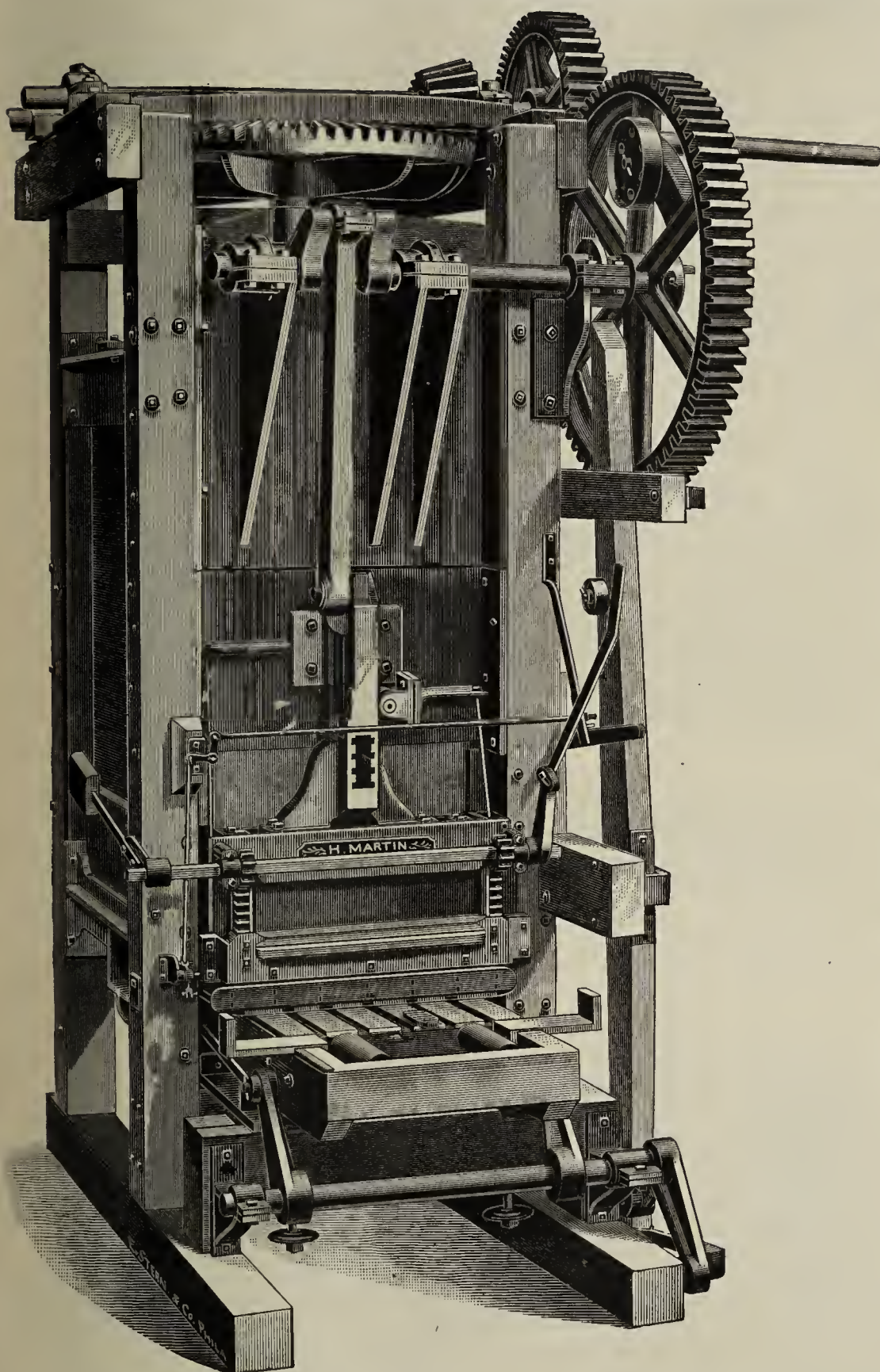
C. & A. POTTS & CO.,

420-428 West Washington St., (Old National Road,)

INDIANAPOLIS, IND.

The "Henry Martin"

Letter "A" Machine.



This machine is strong and durable and capable of moulding the clay exceedingly stiff.

It is perfectly **AUTO-MATIC** and **SELF-STRIKING**.

It has a capacity of from 30,000 to 50,000 brick per day.

It does not require much power.

It is used by many of the largest and best known concerns in the United States.

It works successfully in all kinds of clay.

WHY take chances on others when the merits of the "MARTIN" are so well established.



Plans of complete plants will, be furnished, if desired, free of charge.

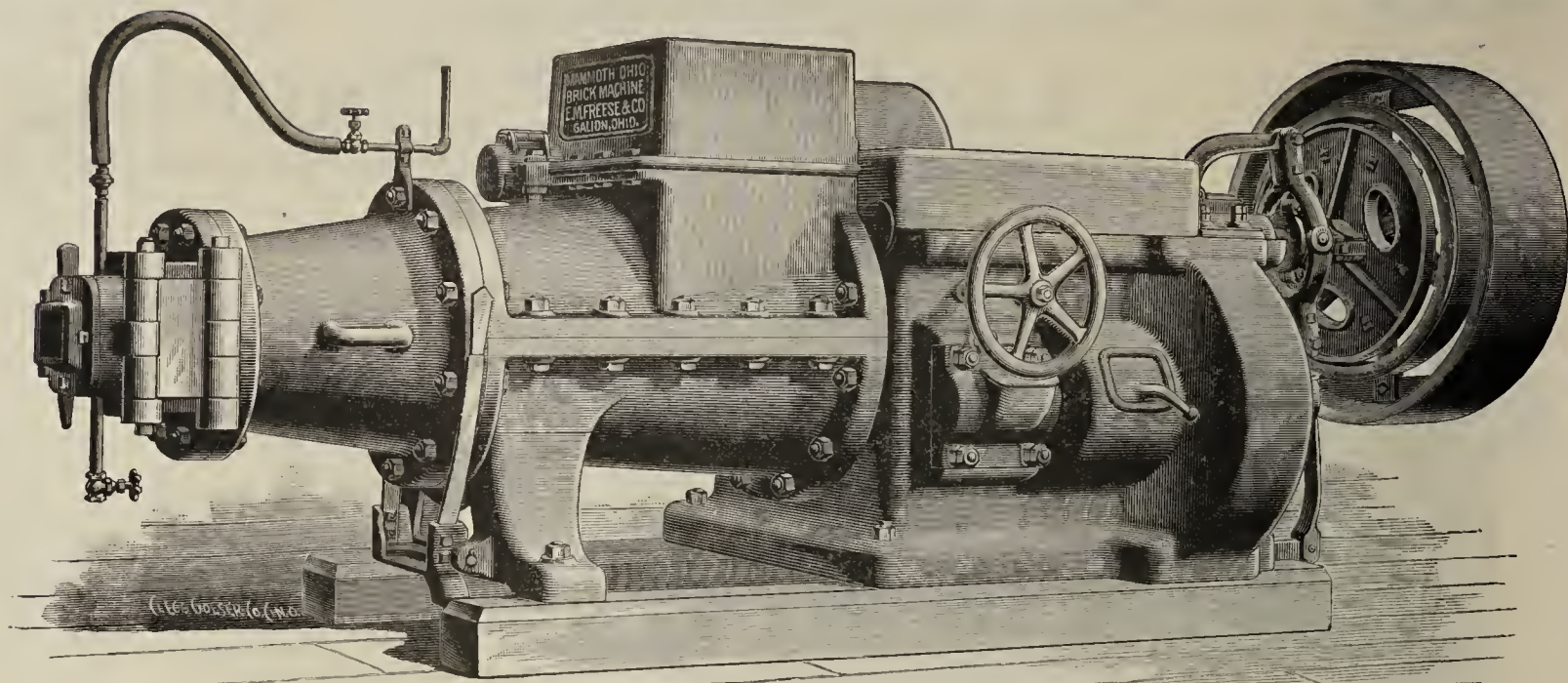
The Henry Martin Brick Machine Mfg. Co.,

Incorporated.

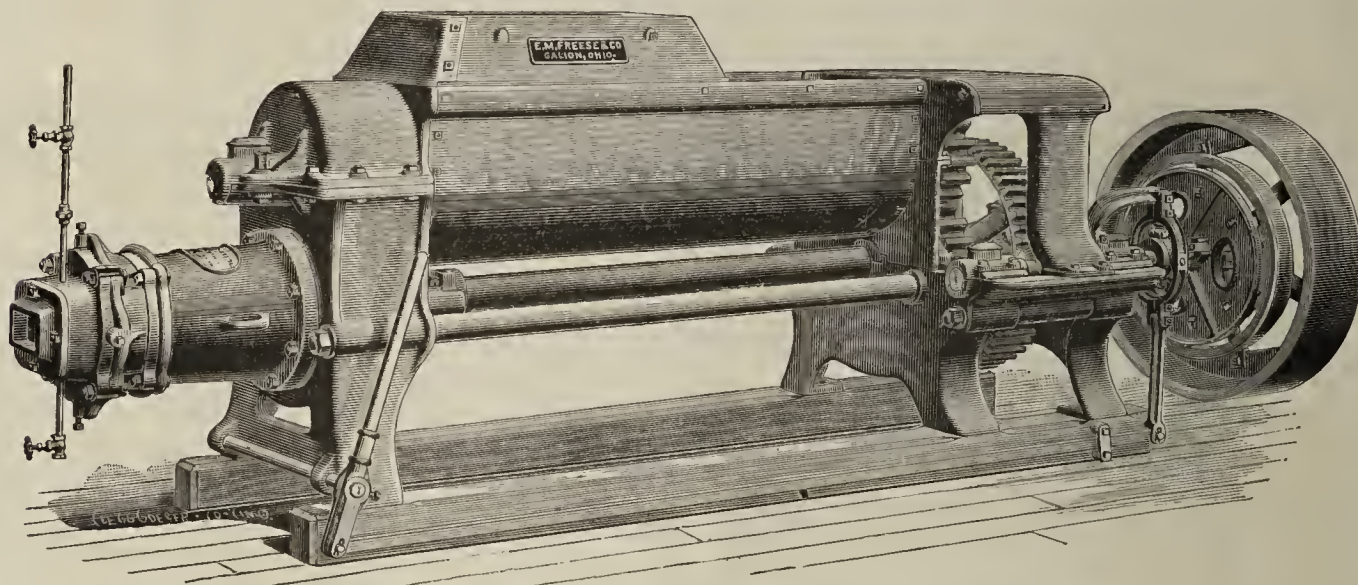
Mention the Clay-Worker.

Lancaster, Penna., U. S. A.

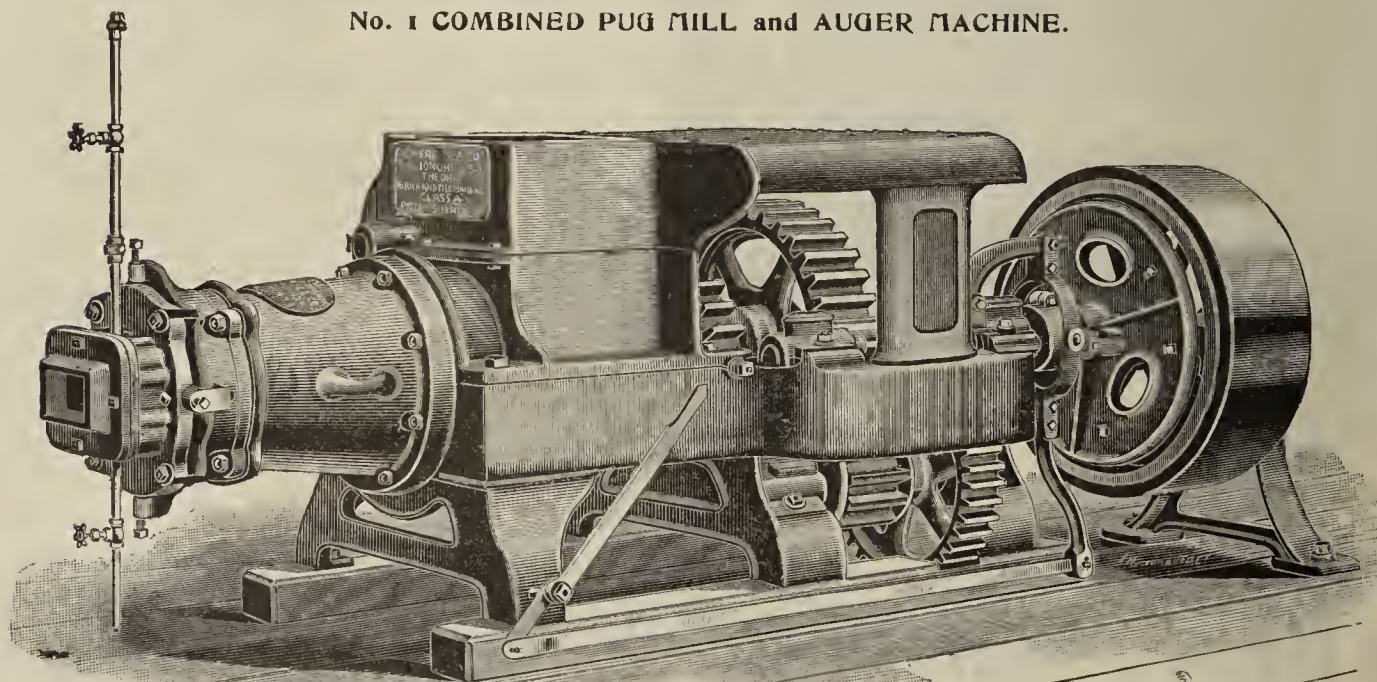
E. M. FREESE & CO., GALION, OHIO.



MAMMOTH BRICK MACHINE.

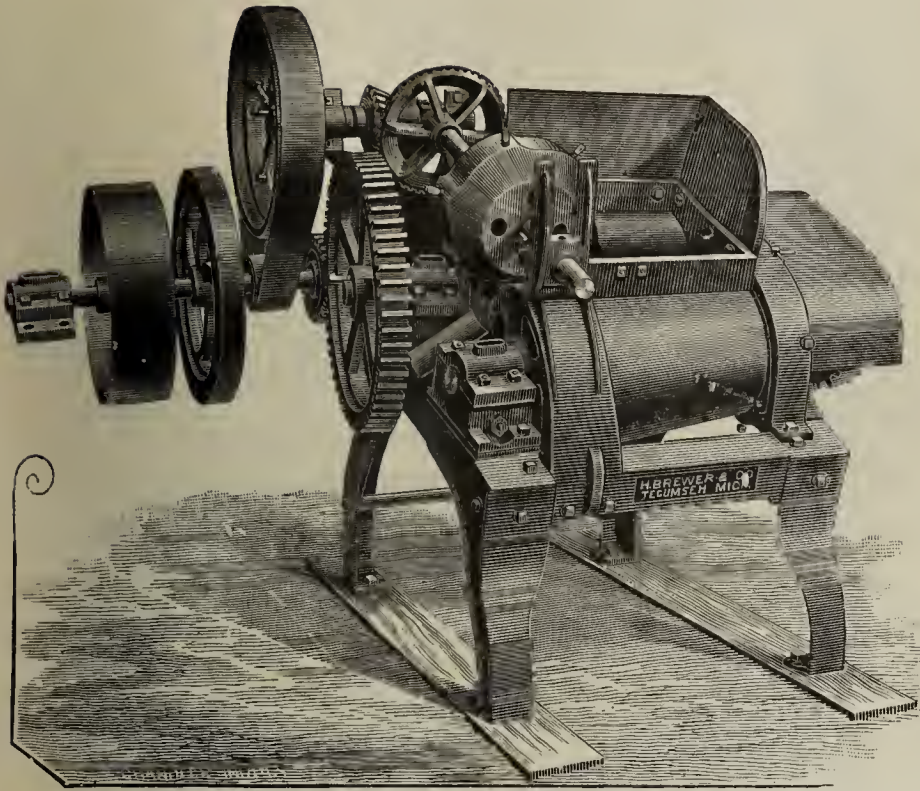


No. 1 COMBINED PUG MILL and AUGER MACHINE.



IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

Send for 136 page Catalogue.

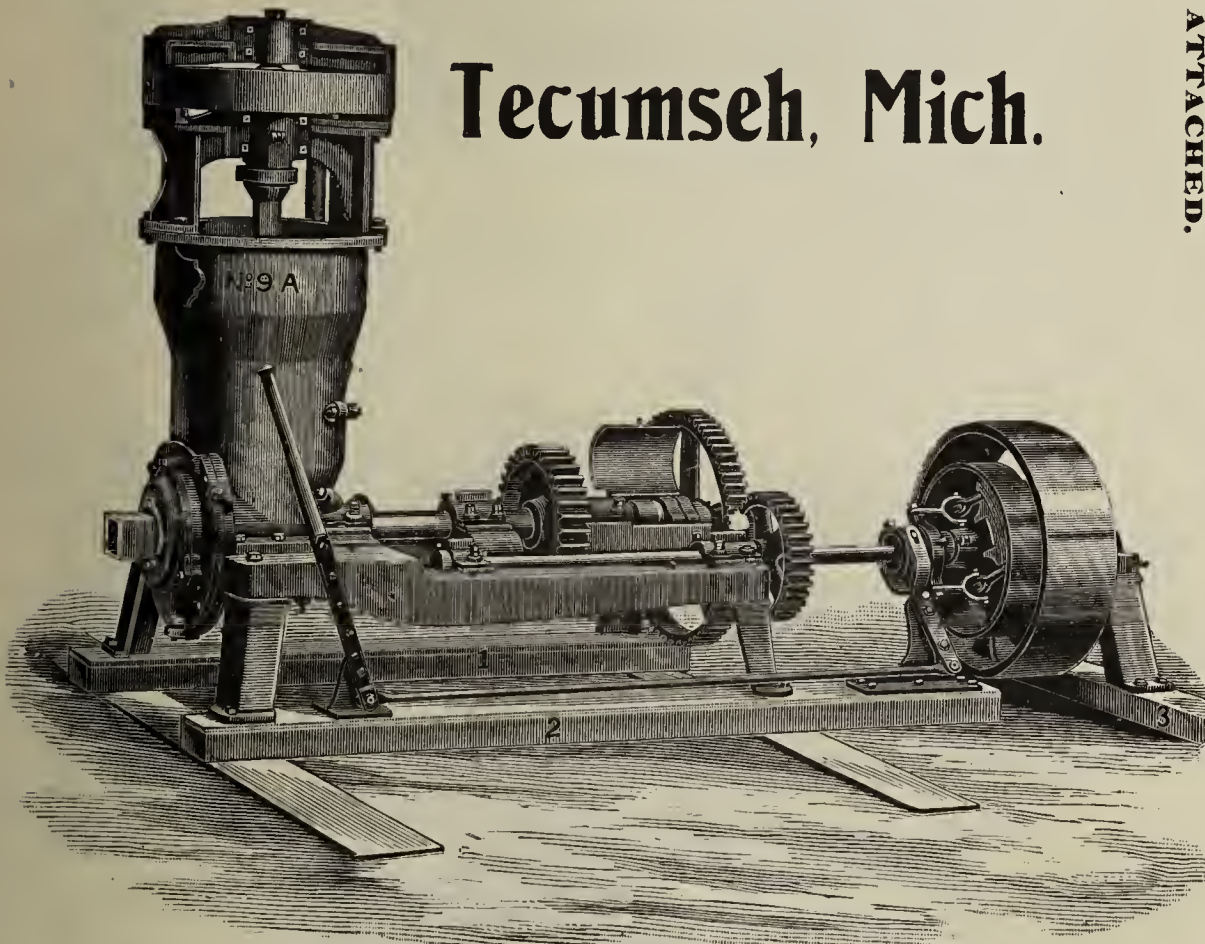


STONE EXTRACTING CLAY CRUSHER.

Manufactured by

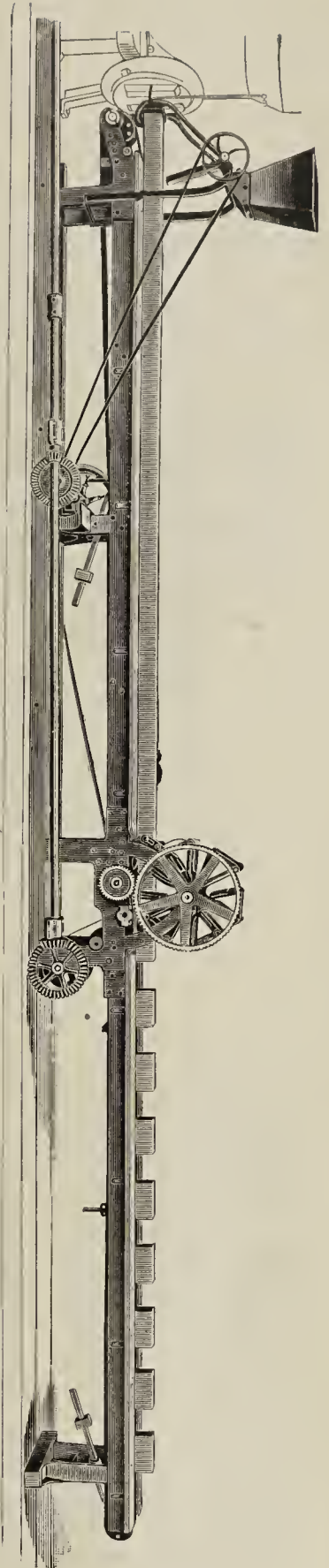
H. Brewer & Co.,

Tecumseh, Mich.



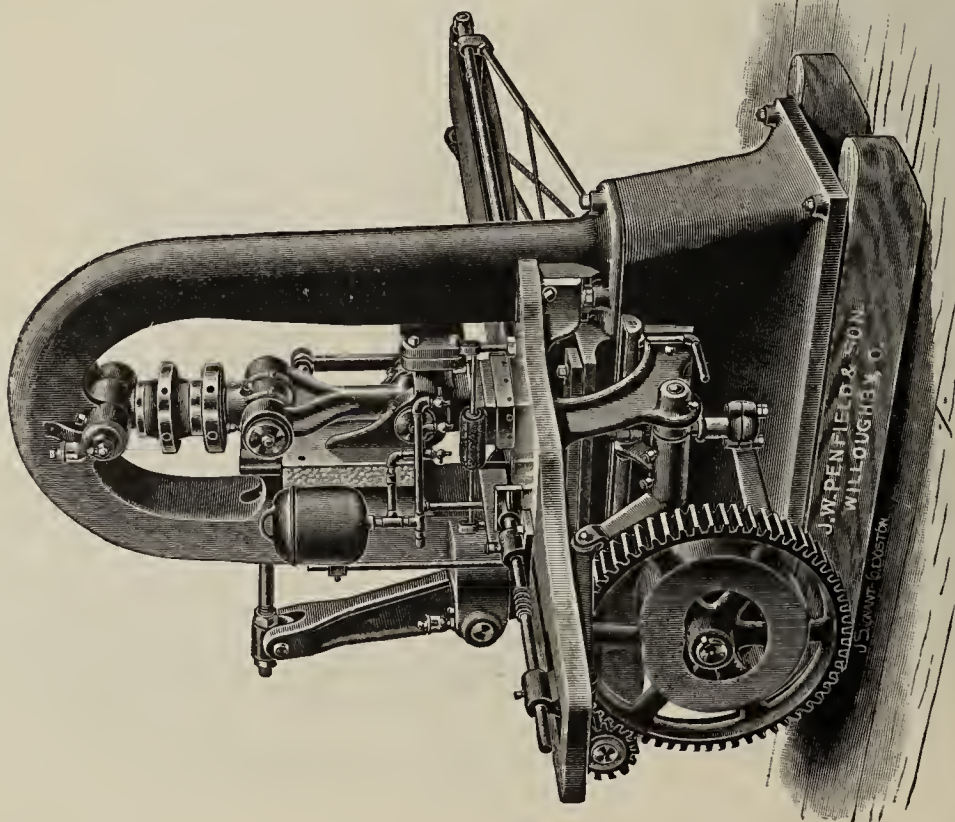
No. 9 "A" BRICK MACHINE.

AUTOMATIC END CUT BRICK CUTTER with SANDER ATTACHED.



RE-PRESSES,

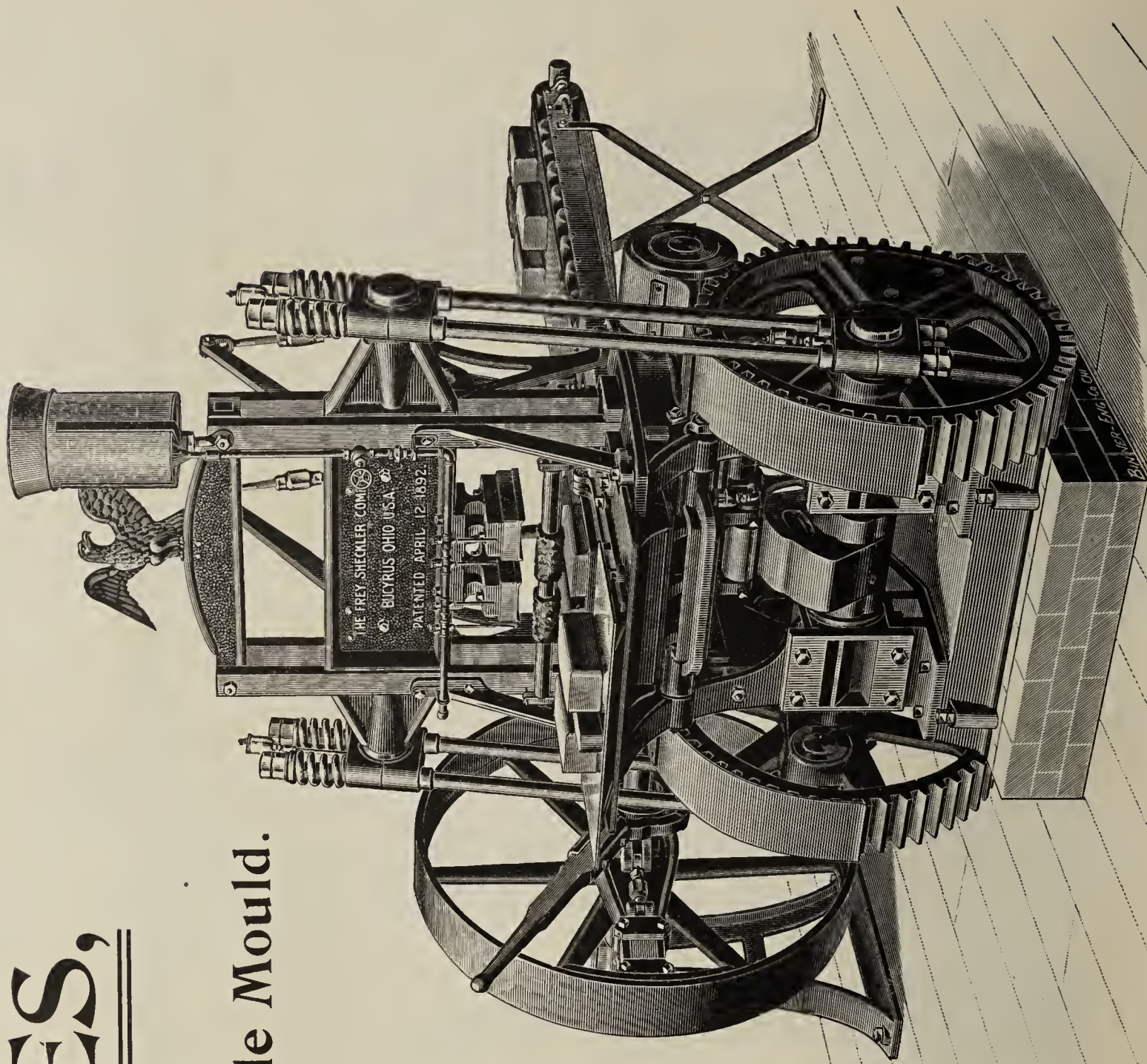
For Stiff Mud Brick,
With Single or Double Mould.



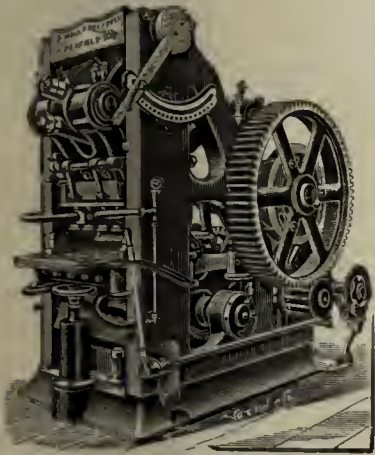
Send for Complete Catalogue.

The American Clay-Working
Machinery Company,

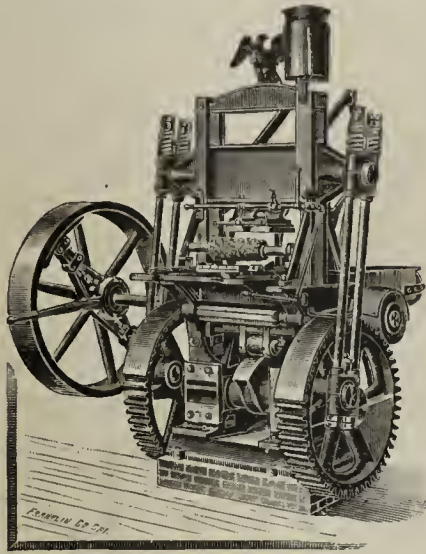
BUCYRUS, OHIO, U. S. A.



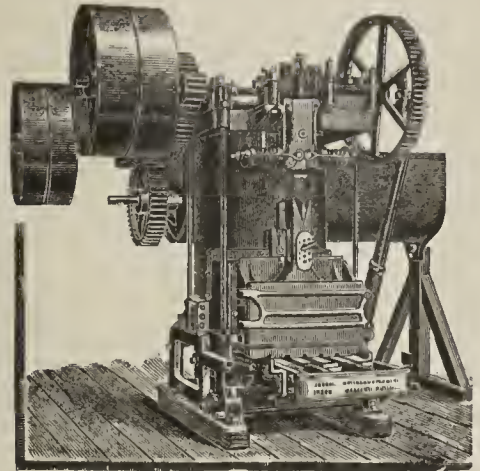
Some of Our Goods.



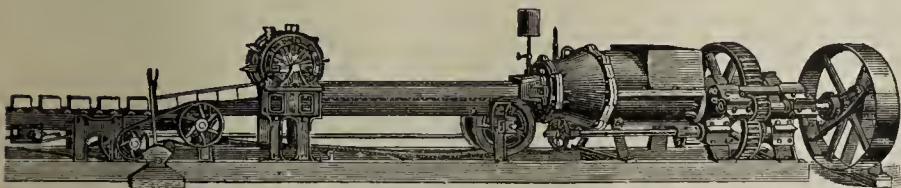
Dry Press Brick Machines.



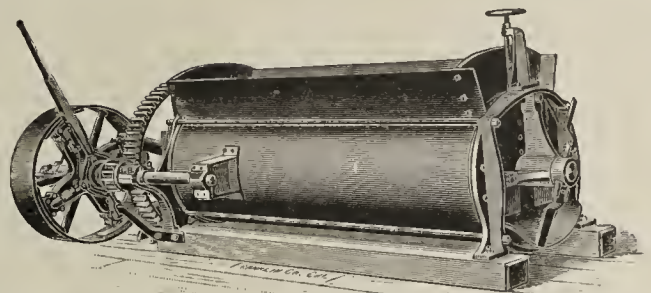
Brick Re-Presses.



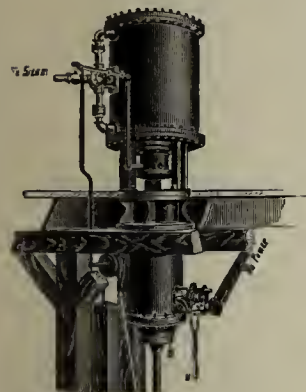
Sand Mold Brick Machines.



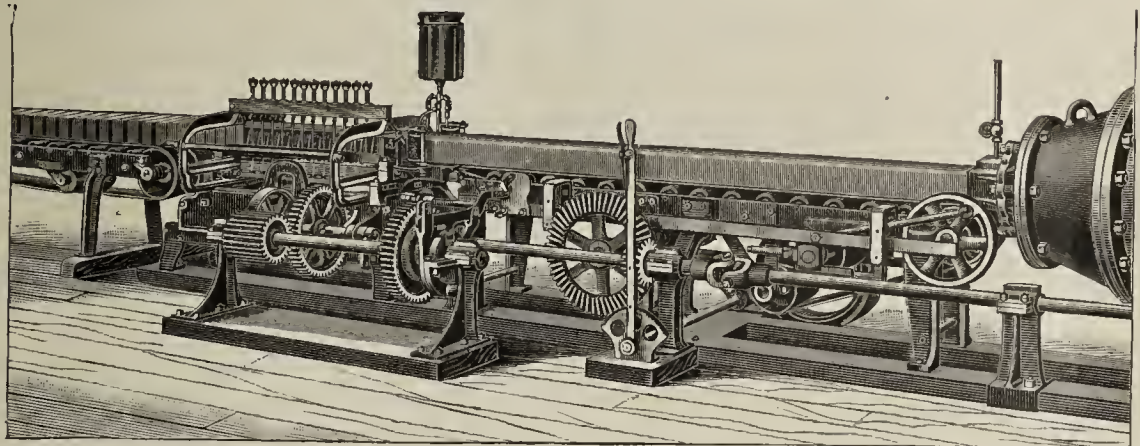
Auger Brick and Tile Machines.



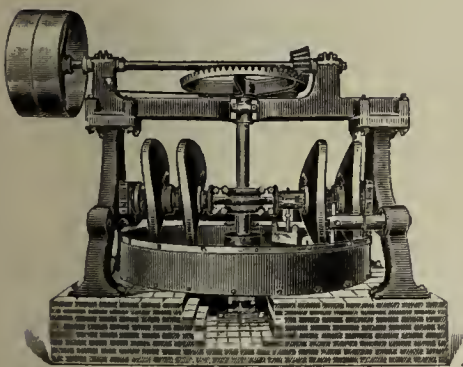
Pug Mills.



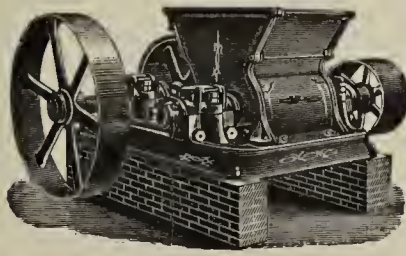
Sewer Pipe Presses.



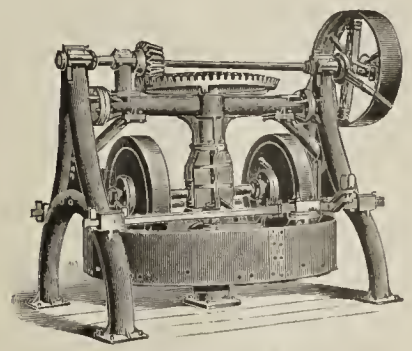
Automatic and Hand Power Brick Cutters.



Special Clay Grinding Mills.



Disintegrators.

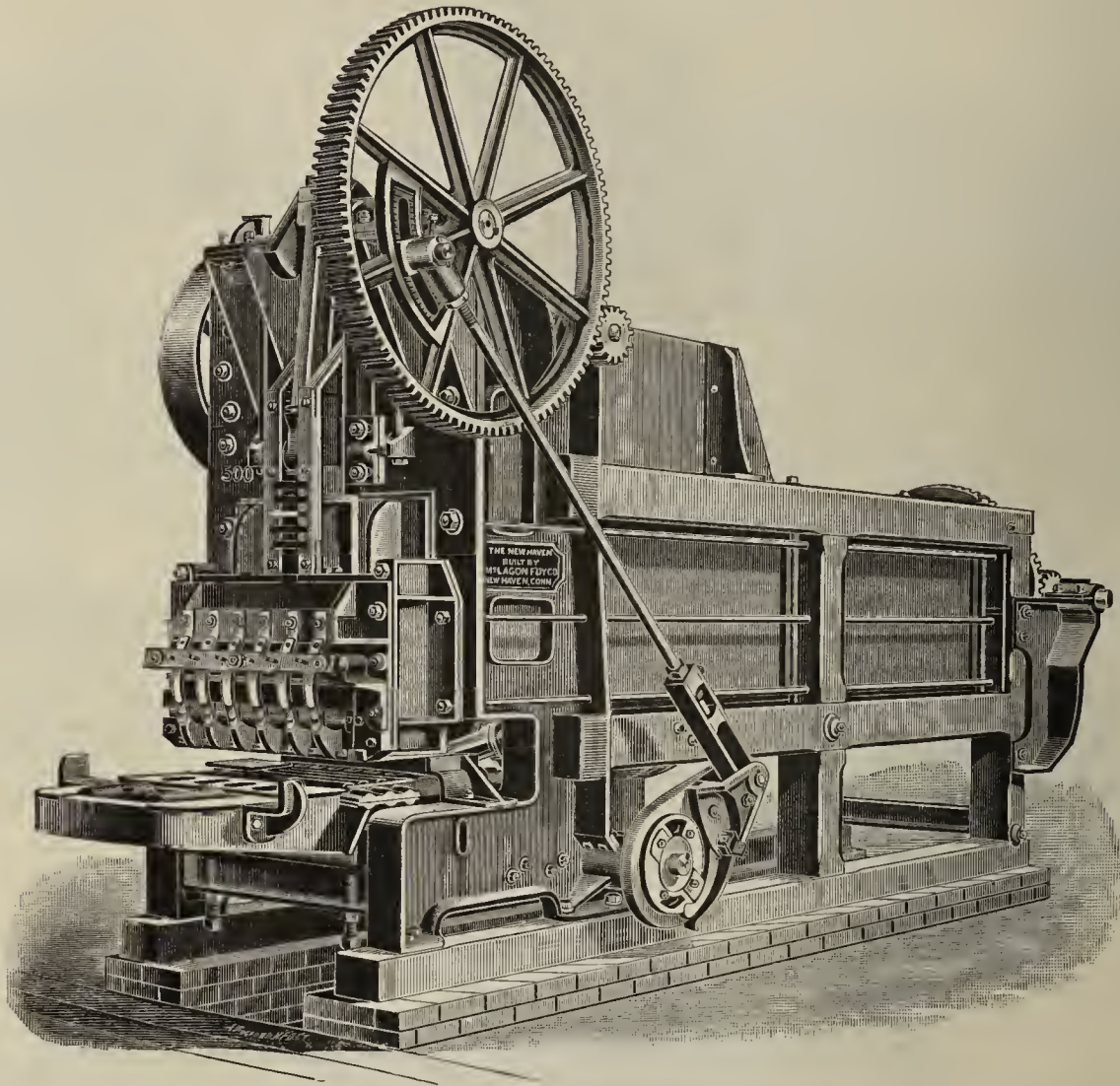


Dry and Wet Pans.

Send for Our Complete Catalogue.

The American Clay-Working Machinery Co.,
BUCYRUS, OHIO, U. S. A.

Another "New Haven" Record.



THE EASTERN MACHINERY CO.,

Gentlemen:—It affords us great pleasure in giving our testimony in favor of your brick machine which we have now used two seasons, without break or bill of repairs. It has made its 40,000 daily without extra attention, and we are more than satisfied with it, and next season we expect to put in another machine of your make. You can refer anyone to us, and we will answer inquiries with pleasure.

Yours respectfully,

CHARTER OAK BRICK CO.,

JOHN E. HEALY, President.

Many More Like This. —

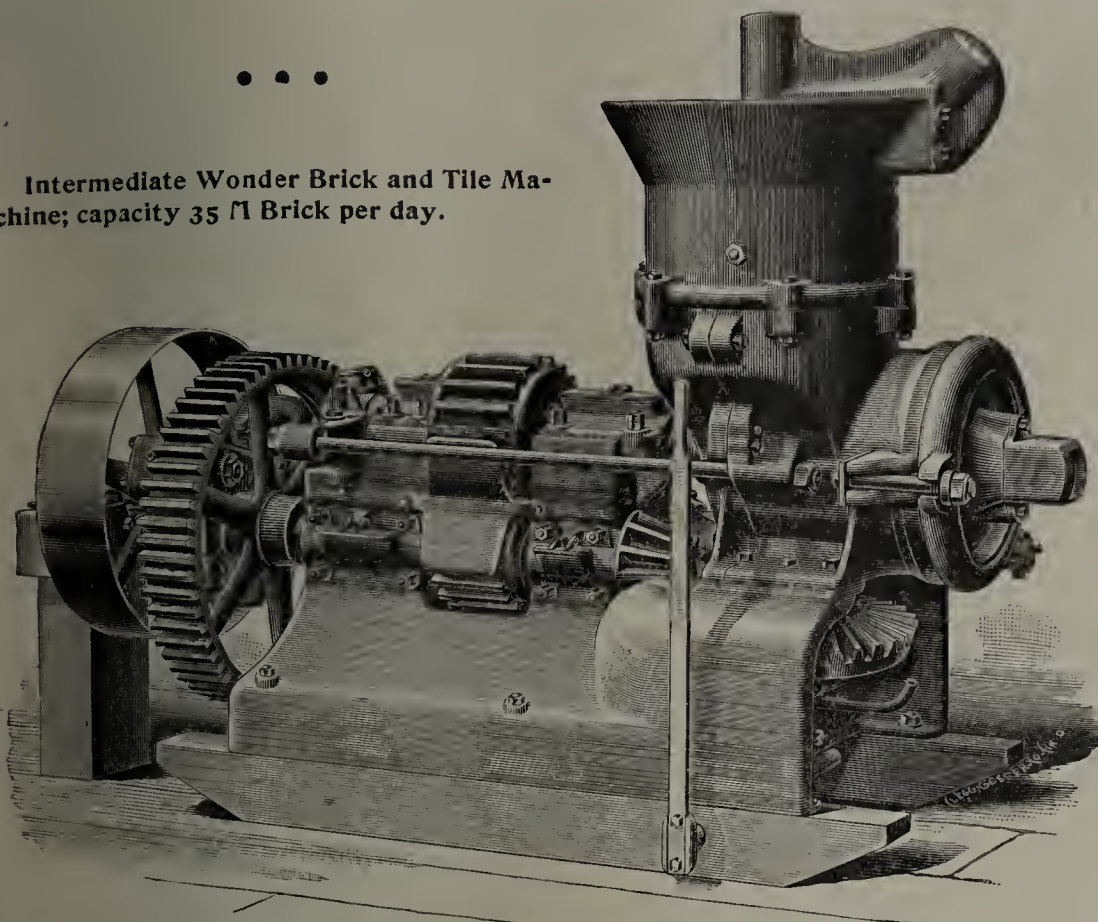
The Eastern Machinery Co.,

— NEW HAVEN, CONN.

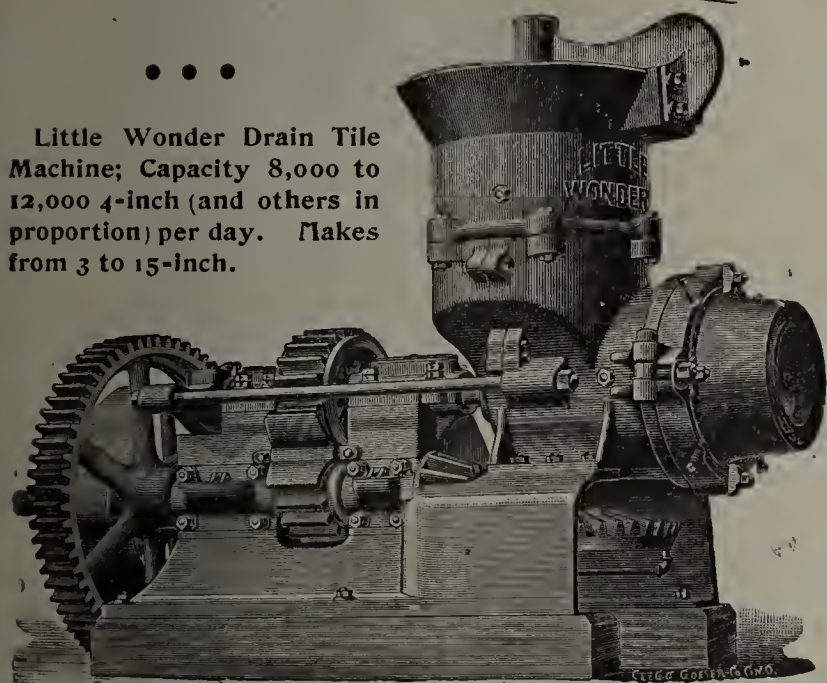
WONDER MACHINERY,

For Brick
and Tile.

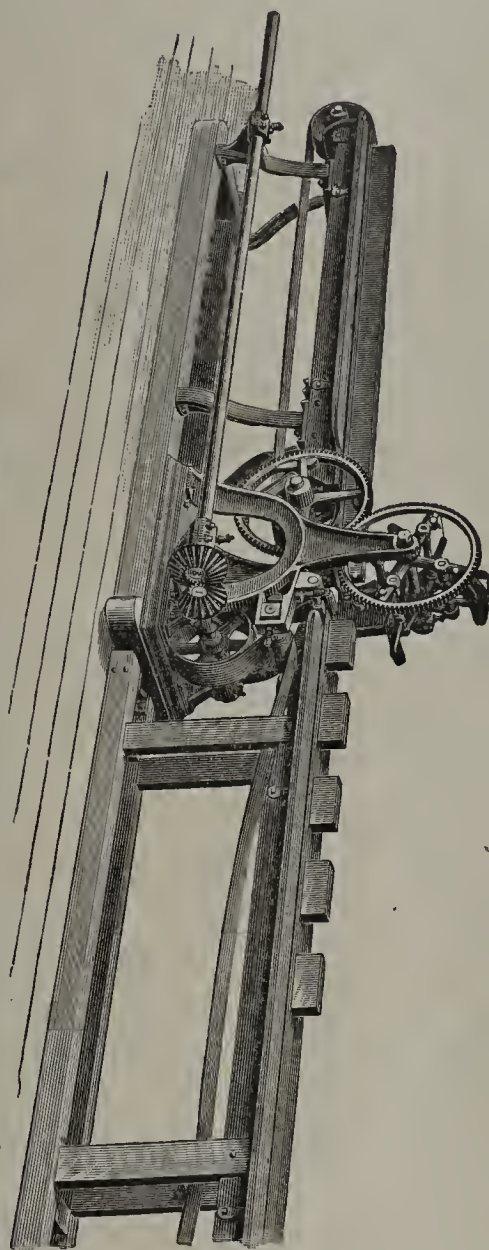
Intermediate Wonder Brick and Tile Machine; capacity 35 M Brick per day.



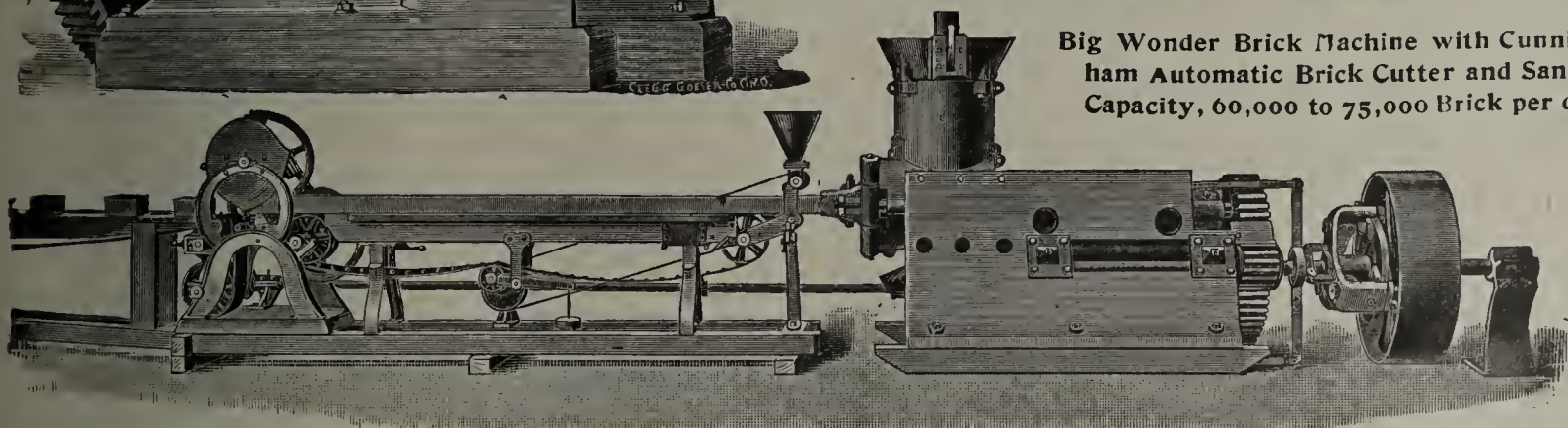
Little Wonder Drain Tile Machine; Capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



Cunningham's Single Stream Automatic
End Cut Brick Cutter.



Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 60,000 to 75,000 Brick per day.



AS MANUFACTURED BY

The Wallace Manufacturing Co.,

Send for No. 14 Catalogue for further particulars.

FRANKFORT, IND.

DRY YOUR

Pressed Brick in the Iron Clad Dryer



F. F. PALMS, PRESIDENT

JOHN B. CORLISS, VICE-PRESIDENT

CHARLES L. PALMS, SEC'Y AND TREAS.

The Cayuga Press Brick Company,

MANUFACTURERS OF

PLAIN, MOULDED AND ORNAMENTAL PRESSED BRICK,

BRICK WORKS AT CAYUGA, IND.
OFFICE, 33 CAMPAU BLDG.,
DETROIT, MICH.

Cayuga, Ind., November 10th, 1896.

WOLFF DRYER CO., Chicago, Ill.

GENTLEMEN:—As you have just completed and turned over to us the four track dryer contracted for; consisting of one tunnel 140 feet long by 17 feet wide with four tracks which gives us a drying capacity of 55 M brick every twenty-four hours, we thought the moment opportune to compliment you upon the successful completion of the work, and the satisfactory manner in which it was done. The dryer has been in operation only a few days but it has thus far accomplished all it was promised to do, and we feel confident it can do even more.

We built the dryer to dry our output which consists of two Boyd 4-mould dry presses and one Penfield stiff-mud machine. We have had considerable trouble in the past making ornamental brick, but in putting them through your dryer we can turn out fully 80 per cent. perfect brick against 30 per cent. under the old system of drying them in the kiln. Our buff shale is very tender and the greatest of care has to be exercised in drying off in the kiln, but under this system we have reduced the time of watersmoking from twelve and fourteen days, to three days, thereby getting rid of the tedious period and increasing the capacity of our kilns fully one-half as we can now turn out a kiln in half the time that was formerly required which reduces our fuel expense about 30 per cent. and time of kiln 50 per cent.

In justice to yourselves and your Superintendent, Mr. Green whom you sent to erect the dryer, we would say, that the work was all done in a first class workman-like manner and satisfactory in every respect and we now pride ourselves on having the best and most complete dryer the market affords. It fully merits the reputation it has and deserves the patronage of Brickmakers in general.

Hoping you increased success in the introduction of dryers to the trade, we remain,

Very truly yours,
CAYUGA PRESS BRICK CO.,
CHAS. L. PALMS, Man.

Write for prices and illustrated catalogue to

WOLFF DRYER CO., Chicago, Ills.



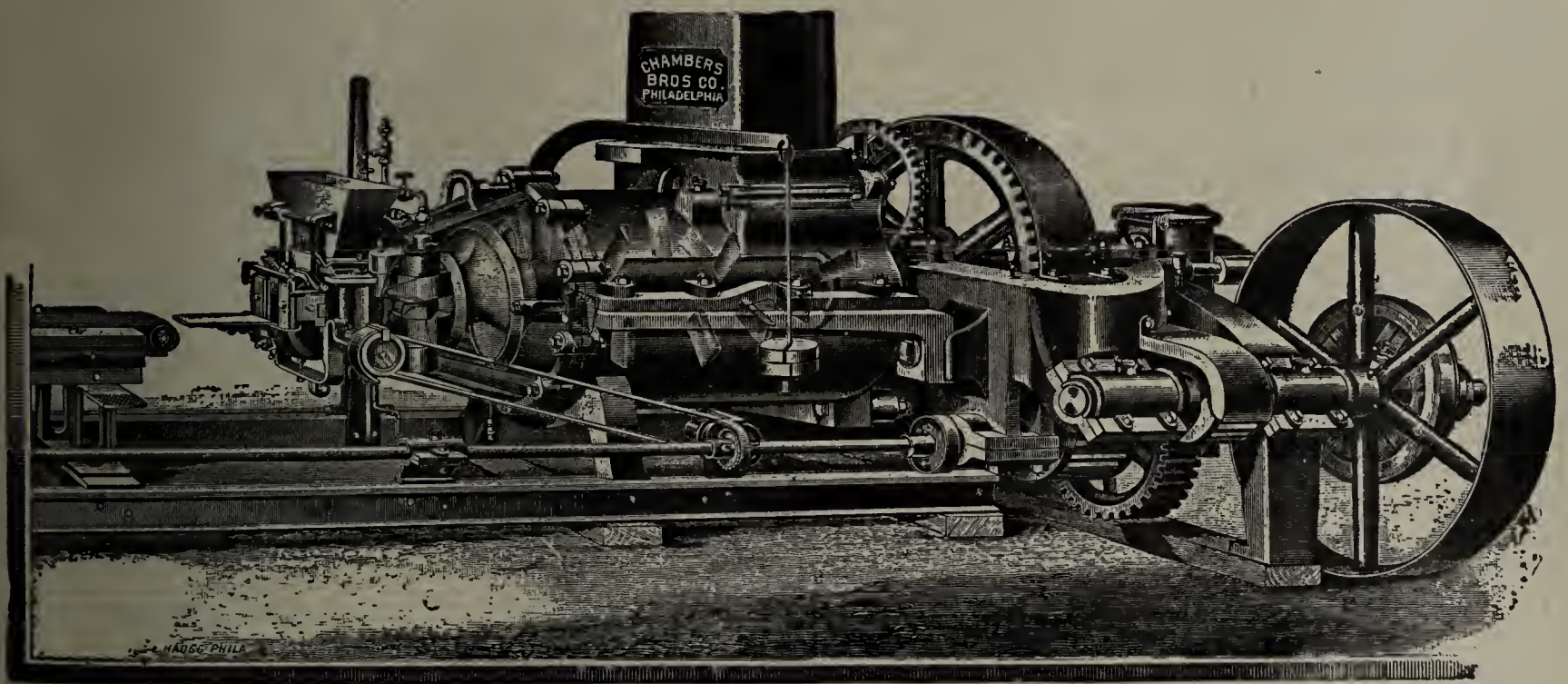
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVII, No. 2.

INDIANAPOLIS, IND., FEBRUARY, 1897.

\$2.00 a Year in Advance.

Brick Making Machinery.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
174 South Clinton Street.

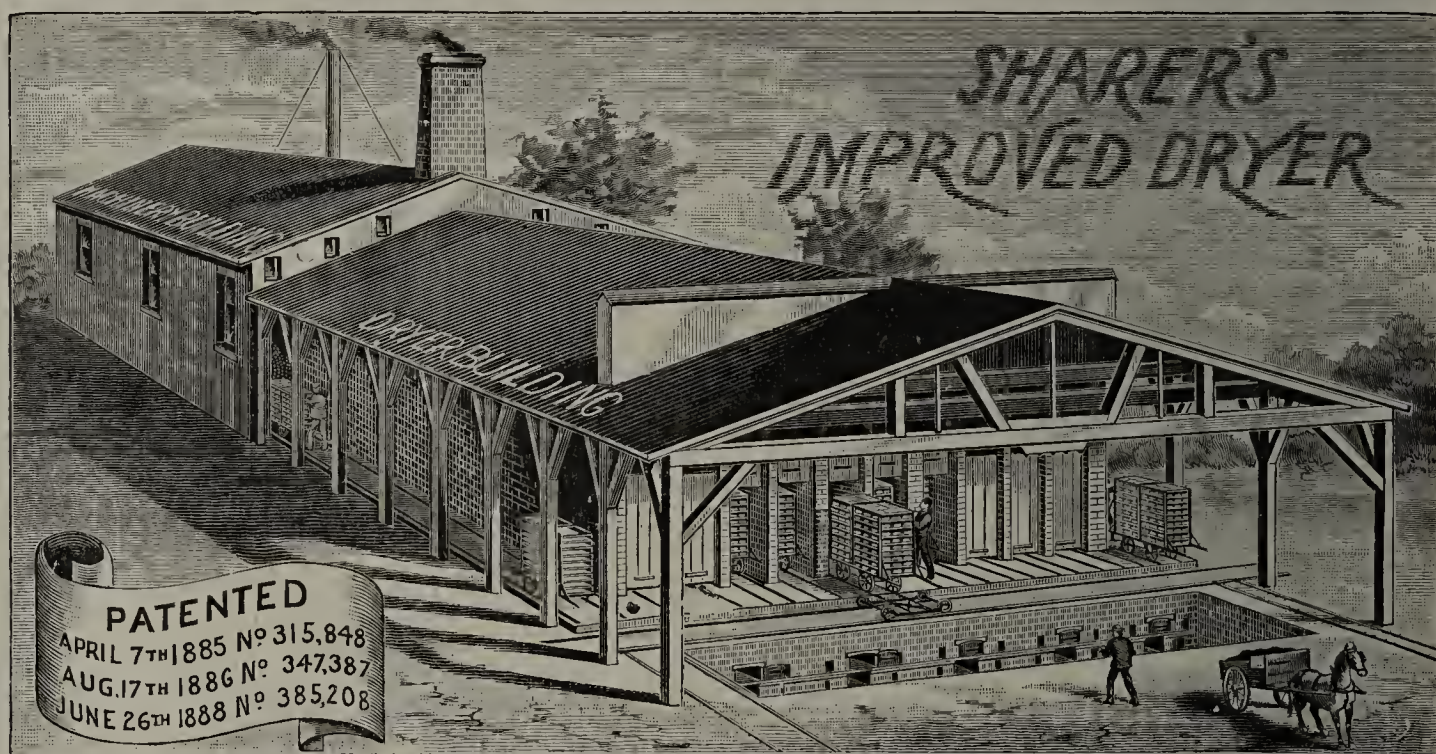
PHILADELPHIA, PA.

Geo. W. Sharer,

Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.

Sharer's Improved Dryer Saves Fuel, Saves Brick, Saves
Time, Saves Money.

Sharer's Improved Calorific Kiln Burns the Largest Per
Cent of Hard Brick at the Lowest Cost for Fuel.



ECONOMY is the Road to Success in all manufacturing lines particularly in brick-making. To insure the highest measure of success clayworkers must use the best and most economical appliances, for therein lies the key to a profitable business. Many years experience enables me to build and equip new brick plants or remodel old ones on practical lines that insures the largest and best output at the least expense.

Complete plants a specialty.

Clays tested and estimates furnished free of charge.

Address, **GEO. W. SHARER,**

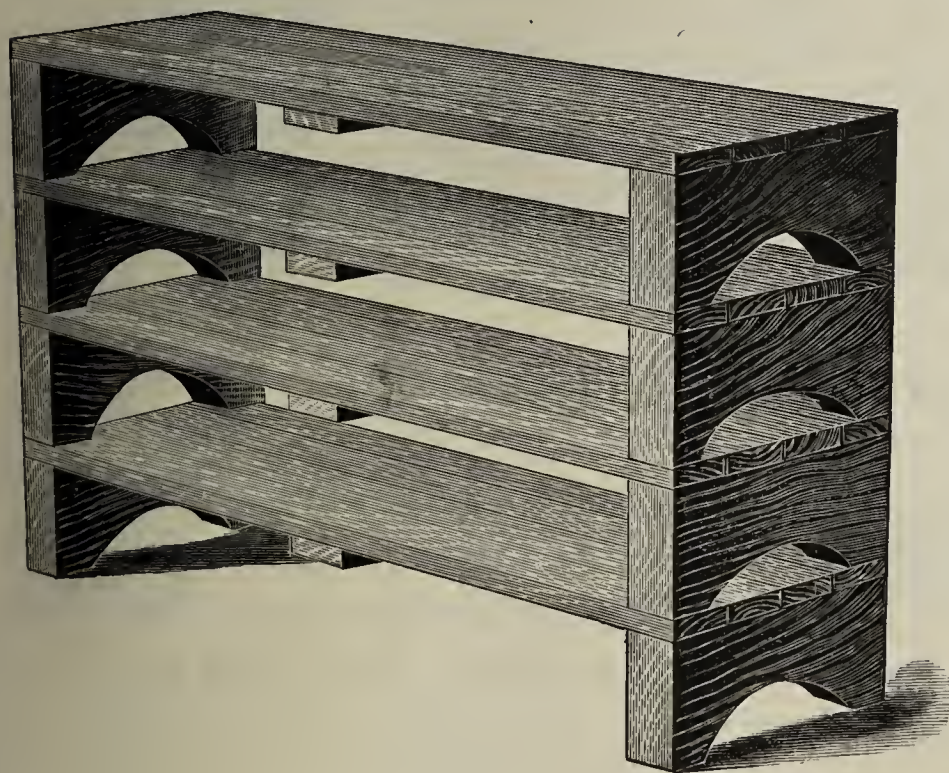
2224 Tioga Street,

PHILADELPHIA, PENN.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.



IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.

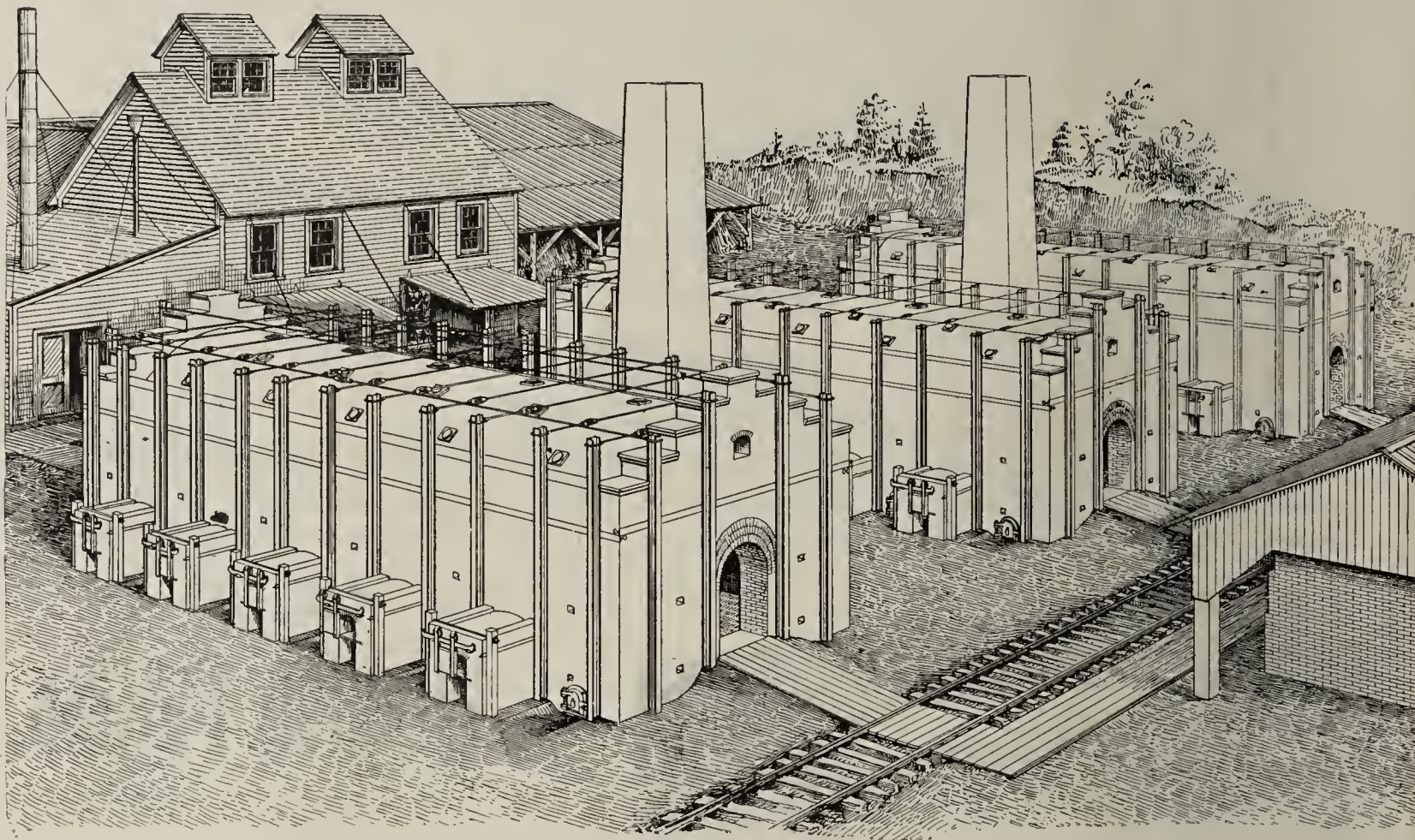
Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., - Saginaw, East Side, Mich.

A Modern Brick Plant

Brick Plants designed by us have the highest reputation for efficiency. They are modern, up-to-date, compact, convenient in arrangement, and not encumbered with unnecessary or useless machinery or appliances.

The Boyd Presses, Flood Up and Down Draft Kilns and Self-Contained Grinding Pans are money makers and money savers, first, last and all the time.



A SURE THING.—For Wise People.

We will construct and equip a Brick Plant of any capacity desired for any responsible party, furnishing Brick Presses, Power, Kilns, Clay-preparing Machinery, Shafting, Belts, etc., and erect the necessary Buildings. We will make and burn one or more kilns of brick, and turn the Plant over to him in proper working order under guarantee of satisfactory results as to quality of product and cost per 1,000; the loss to be ours in case of failure.

CHISHOLM, BOYD & WHITE CO.,

OFFICE AND WORKS:
57th and Wallace Streets.

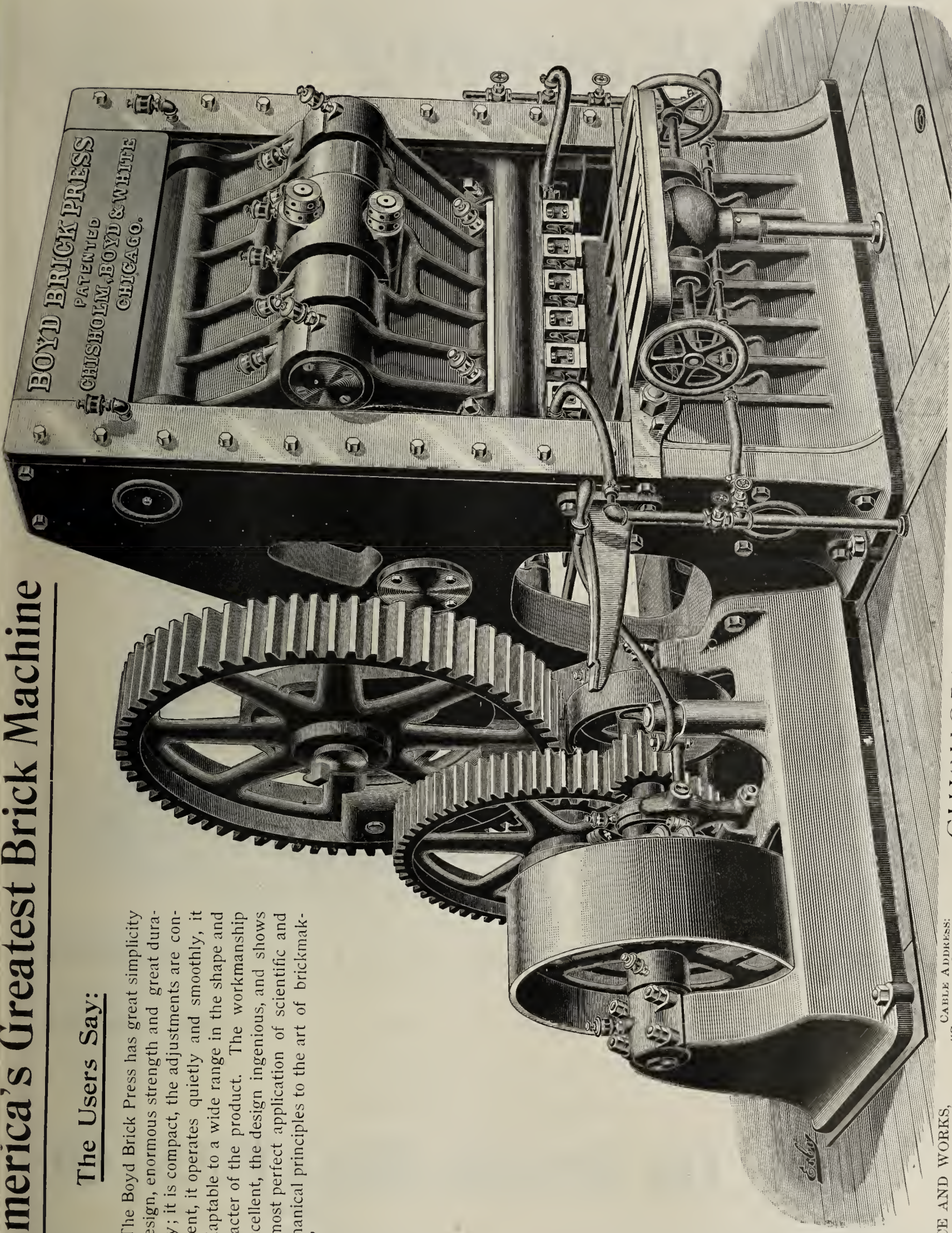
CABLE ADDRESS:
"CHISHOLM, CHICAGO,"
A. B. C. CODE USED.

CHICAGO, U. S. A.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,
57th and Wallace Streets.

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A

Clay=Working Machinery.

The
Simpson
Brick Press,

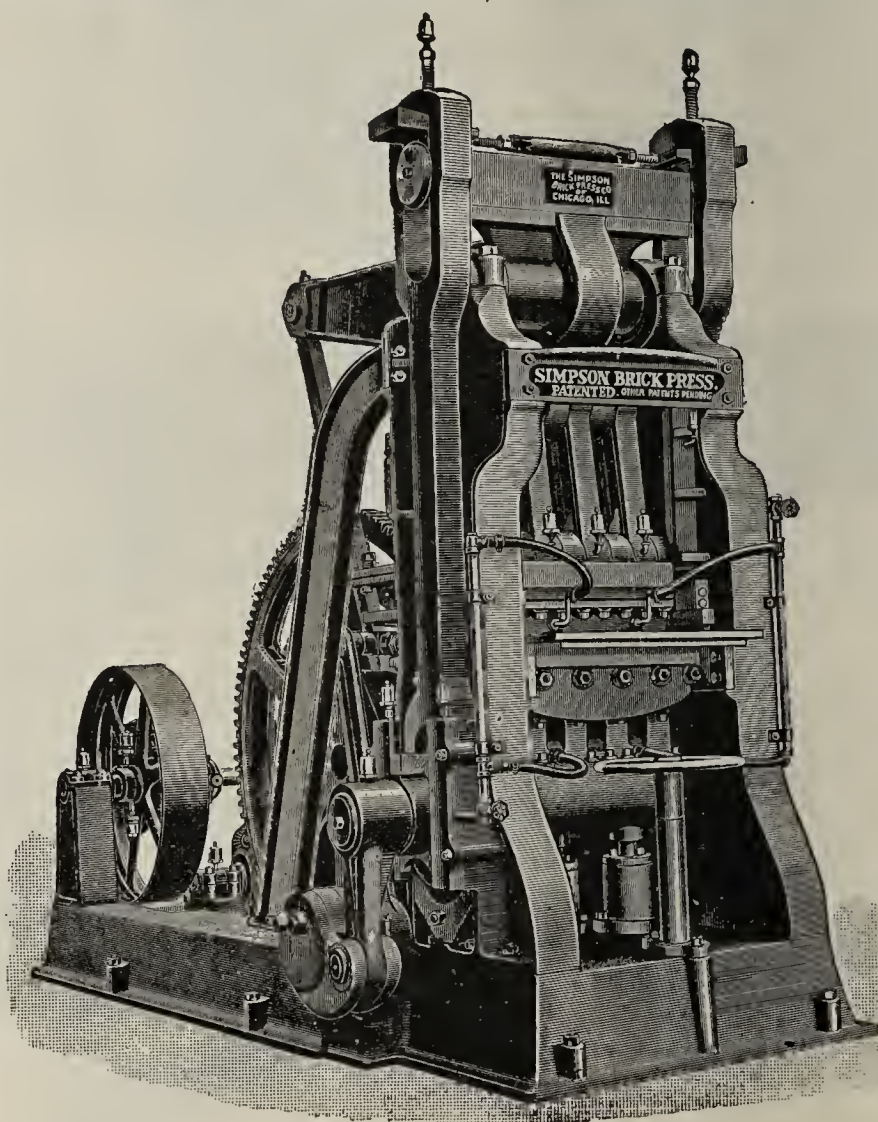
THE
WORLD'S
STANDARD.

.....

Used by all successful
brickyards throughout the
United States and Canada.

We manufacture a com-
plete line of Clayworking
machinery.

Write for catalogue.



Do not experiment. Invest your money in a **SURE THING.**
Complete plants constructed and guaranteed.

THE SIMPSON BRICK PRESS CO.,

Agents for Canada:

WATEROUS ENGINE WORKS CO.,
BRANTFORD, ONTARIO.

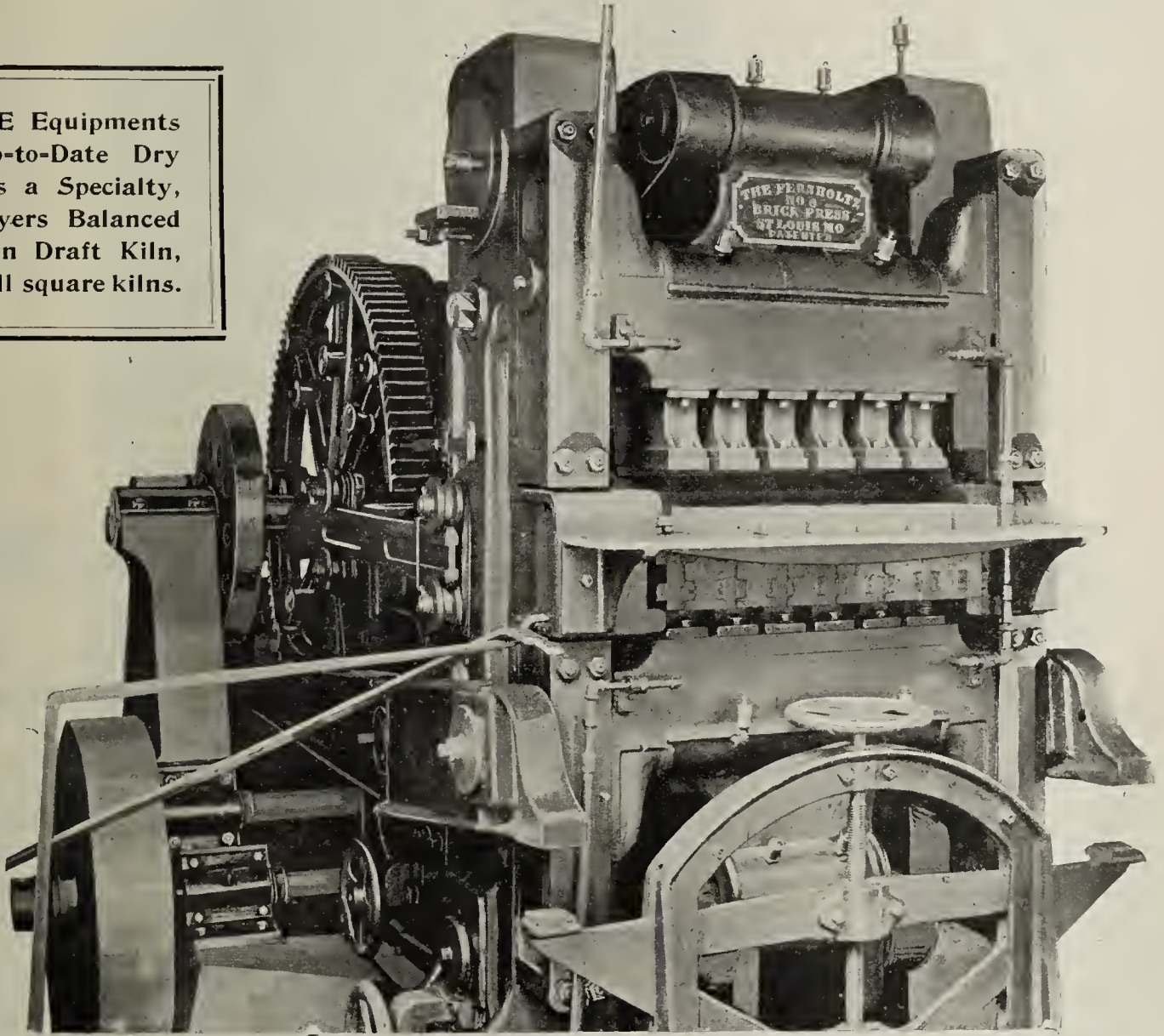
Manufacturers and Engineers,

Chamber of Commerce, Chicago.

The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMPLETE Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

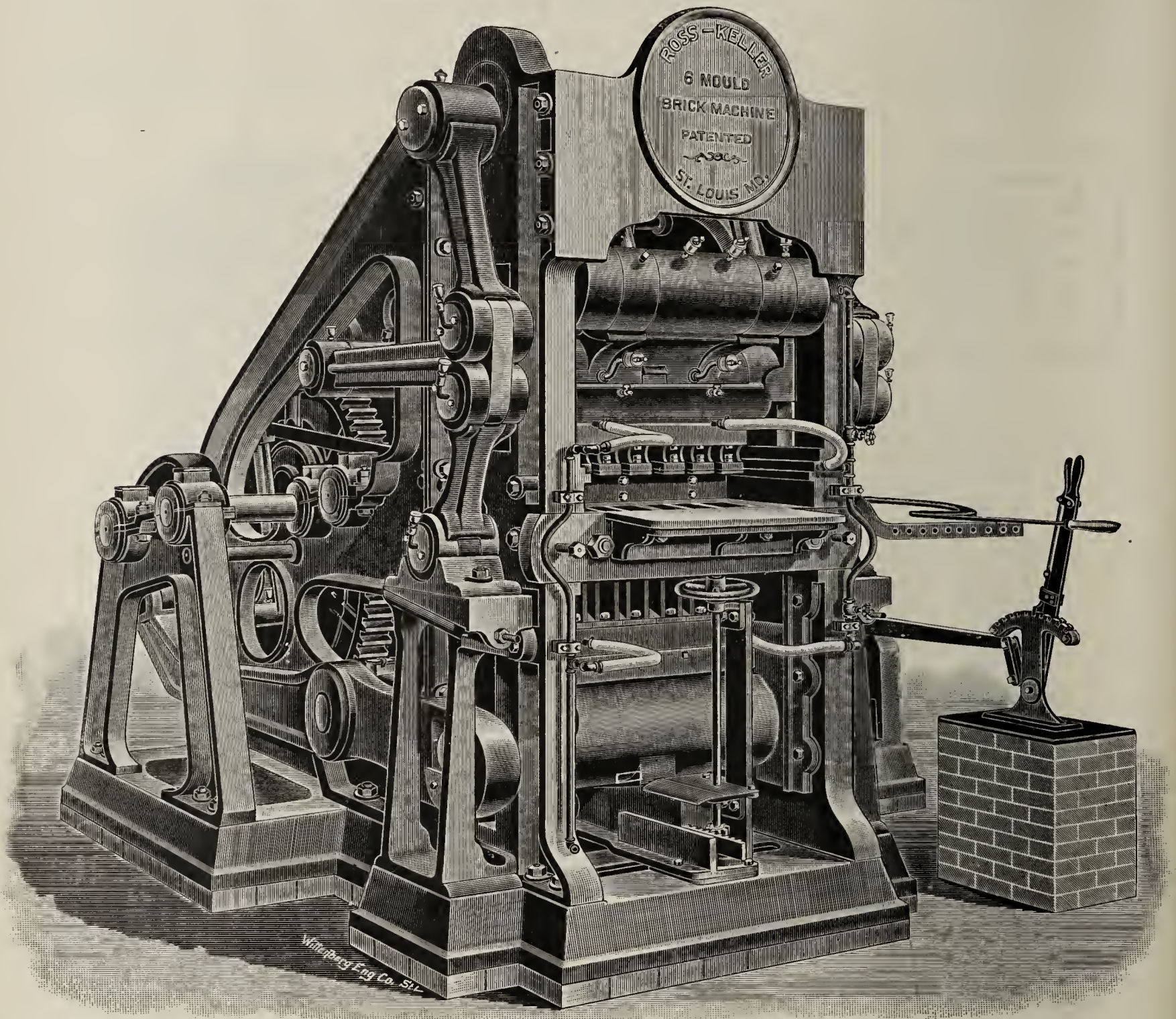
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—————BRICK SET IN KILN DIRECT FROM MACHINE.—————



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

ST. LOUIS, MO., U. S. A.

"A Clay Pulverizer of Wonderful Capacity."

SO SAY ALL WHO HAVE USED IT.

St. Louis, Dec. 24, 1896.

Messrs. Milton F. Williams & Co.,

Gentlemen:-- We take pleasure in advising you of the very satisfactory service obtained from the Combined Crusher and Pulverizer bought from you six months ago, which we have used almost continuously on hard burnt clays. We find that it will pulverize much faster and finer than any grinding machine we have ever used, its capacity up to this time having been limited by the size of our screens. When we provide adequate screening attachment we are confident that the pulverizer will develop a capacity almost treble that of our old grinding pans.

Wishing you success, and with compliments of the season, we remain
Yours truly,

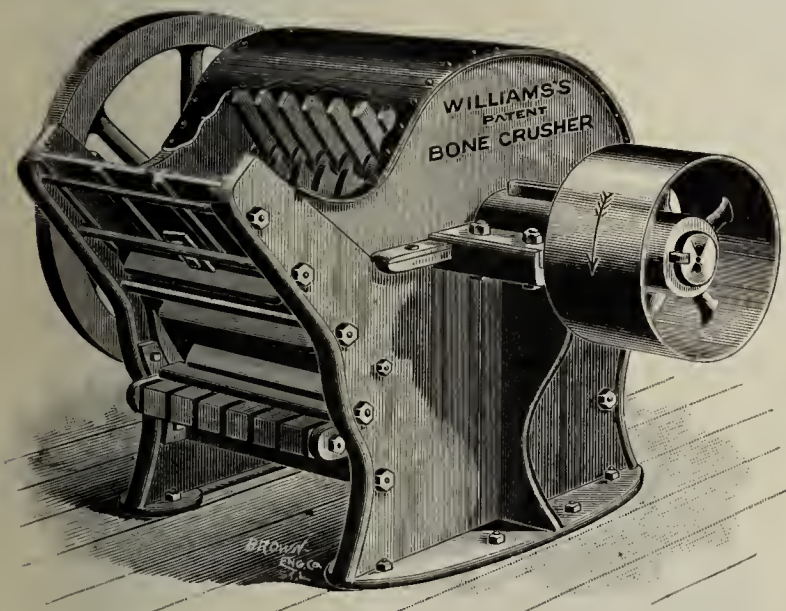
J. B. CLEMENTS,

V.P. & Gen. Mgr. Christy Fire Clay Co.

We can send you many more like this.

WILLIAMS'S

COMBINED SHALE CRUSHER and CLAY PULVERIZER



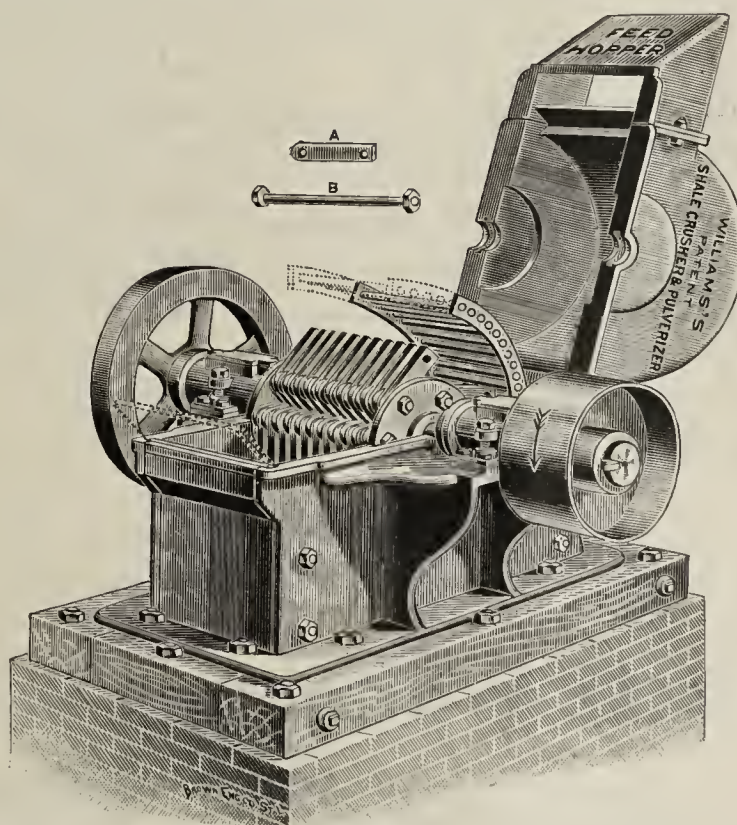
Williams's Shale Breaker.

THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

MILTON F. WILLIAMS & CO.,

2705 North Broadway, - - St. Louis, Mo.



Williams's Shale and Clay Pulverizer.

With Clay Steamer Attached.

Columbia Brick Press.

All working parts are made of Steel.

The pressure is exerted from both top and bottom; consequently there is no lateral strain on the machine.

The pressure is absolutely equal on top and bottom of brick.

A brick with granulation cannot be made on this machine.

The liners on mould can be taken out and replaced in five minutes, without removing any other part of the machine.

Any part of the gearing can be removed without taking machine apart.

The mould box can be taken out in a few minutes, without disturbing the other parts of machine.

The "COLUMBIA" presses clay or shale as dry as a hydraulic press, or so damp as to approximate a stiff mud brick, so that the range of products is from building brick to pavers. No other press does such a variety of work.

The "COLUMBIA" is the only brick press on the market that meets ALL the needs of a brick plant.

For circulars and prices, address

H. B. HILGEMAN,

General Agent "COLUMBIA Brick Press,
... and "COLUMBIA" Mould,

306 Oriel Building, ST. LOUIS, MO.

Terrazo Cement Tiles.

Complete Plants furnished for making the celebrated "TERRAZO" Tiles. Used to the exclusion of all other tiles in all floors, halls, etc., of the following among hundreds of structures in Germany:

JOHANNIS CHURCH, ROYAL AGRICULTURAL COURT, ROYAL DEPARTMENT OF THE INTERIOR, DRESDEN; GERMANIA PALACE, BERLIN AND ANHALT RAILROAD DEPOT, IMPERIAL ART AND MECHANICAL MUSEUM, ROYAL MILITARY ACADEMY, BERLIN; IMPERIAL POST OFFICES, DRESDEN, BERLIN AND
..... LEIPSIG.....

Terrazo Tiles, any color, design or size. For circulars, estimates, etc. Address

H. B. HILGEMAN,

General Agent of THEO. WELGE, for the sale of Dr. BERNHARDI SOHN, G. E. DRAENERT, GERMANY, Machinery and Processes for making TERRAZO CEMENT TILES.

306 Oriel Building, ST. LOUIS, MO.

THE ANDRUS DOUBLE PRESSURE 4-Mold BRICK PRESS.

Produces the finest pressed brick from dry or semi-dry clay at less cost than common brick by any other process. This press is the **Simplest** and the **Strongest** press on the market, and has given **universal satisfaction** to purchasers. We guarantee it against breakage **for 5 years**.

Send for descriptive catalogue.

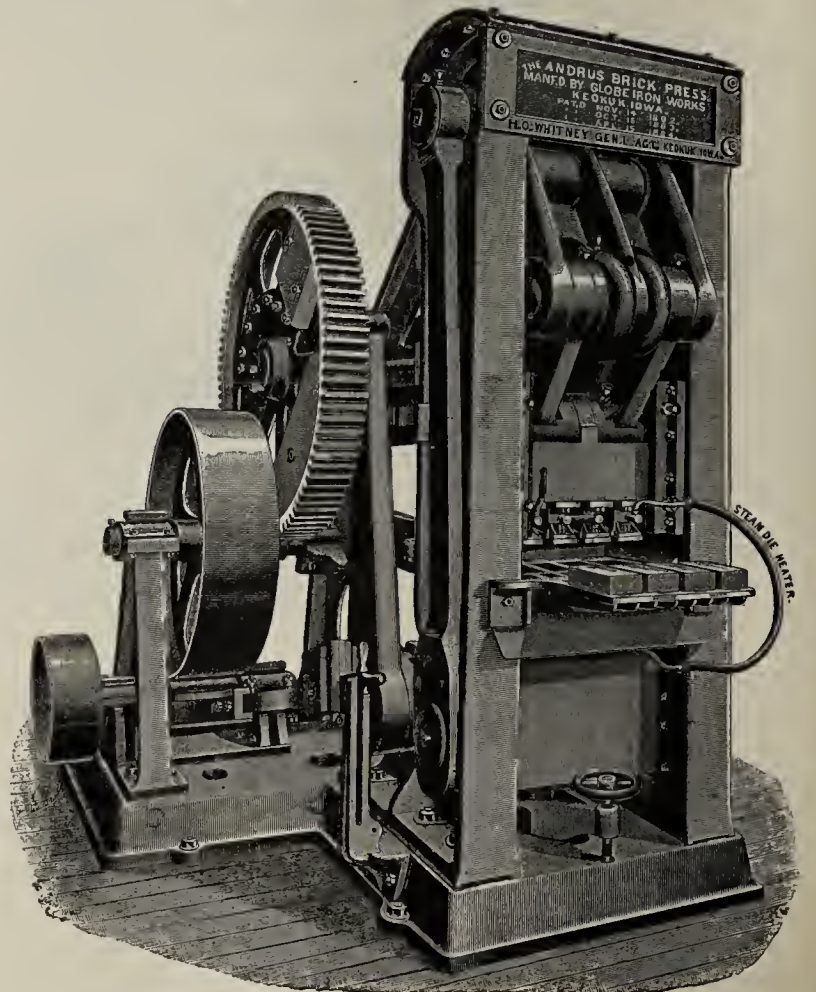
Address, _____

H. O. Whitney,

General Agent,

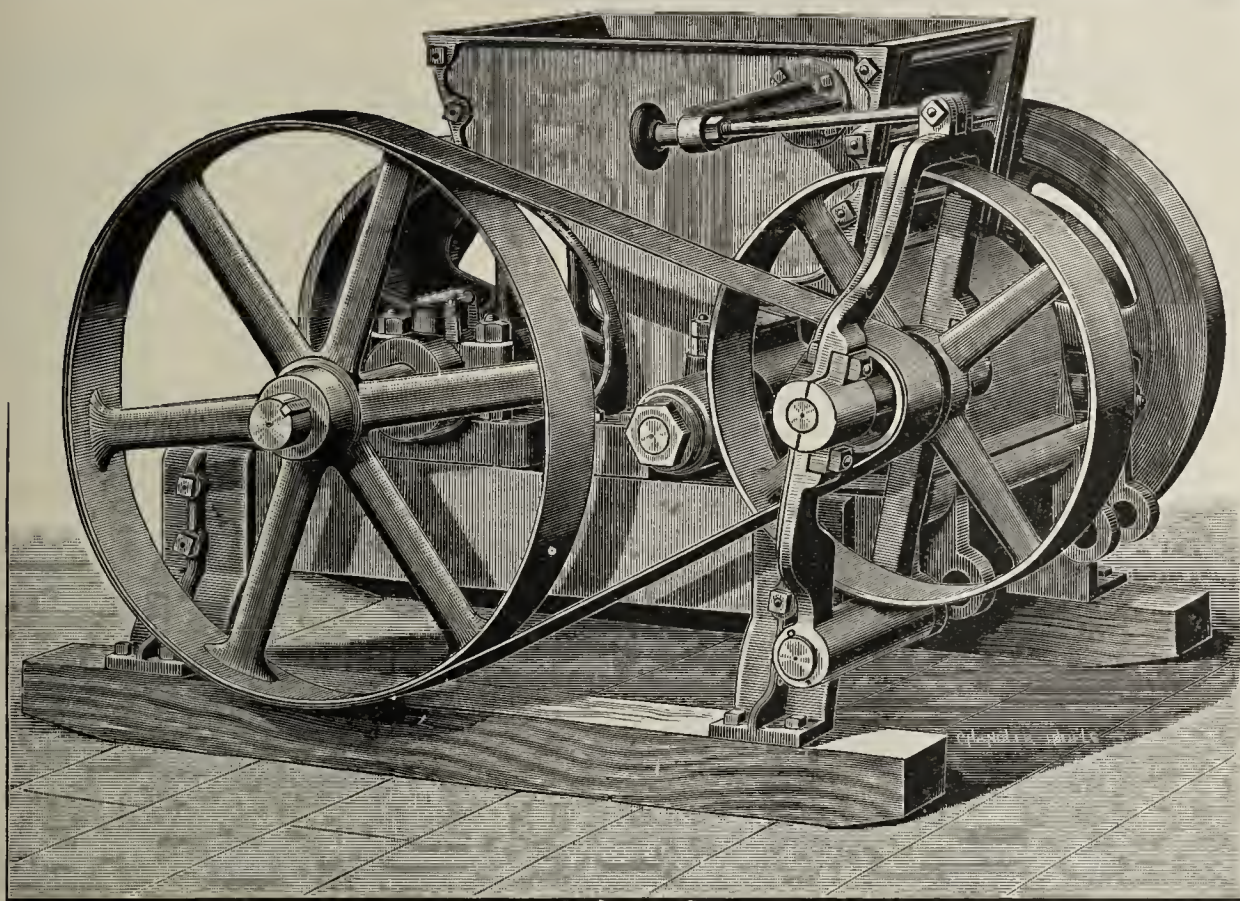
GEN. OFFICE AND
FACTORY.....
KEOKUK, IOWA.

KEOKUK, IOWA.



The Potts Disintegrator.

Built of good material by experienced mechanics Strong and Durable. The only machine built that will work the clay direct from the bank and not **choke or clog** from hard, dry or wet sticky lumps of clay. They **separate** the **large stones** and grind the small ones. No Brick or Tile Manufacturer can afford to be without this machine.



PATENTED.

Warning:== There are now several so-called Disintegrators on the market. **Beware** of them, for they are infringements **Patents,** of our

which have been sustained by the Supreme Court of the United States. The manufacturer of these **infringing** machines may offer you a **Bond** to protect you from **Damages.**

Beware Of this bond it may be like some we now have, **not worth the paper** it is written upon.

When you purchase a Potts you take no chances of damages and at the same time get a machine that is well built, and sold at the least possible price such machinery can be sold for. Write for prices.

C. & A. POTTS & CO.,

420-428 West Washington St., (Old National Road,)

INDIANAPOLIS, IND.

THE N. B. M. A.

While in session at Buffalo discussed the problem of drying thoroughly and with more than usual earnestness, thus emphasizing the fact that more attention is being paid to the subject than formerly.

While there was, naturally, some diversity of thought as to methods, the consensus of opinion was that a Modern Drier is an important factor, and an absolute requisite in the operation of a MONEY-MAKING brick plant.

The STANDARD IMPROVED BRICK AND TILE DRIER

Is the acknowledged LEADER of Modern Driers. It is not an untried or doubtful experiment, but a recorded success, as the letter given below, from an experienced brickmaker, testifies:



The Standard Dry Kiln Co., Indianapolis, Ind.

Tip Top, Va., December 7, 1896.

Gentlemen—Replying to your favor of the 3d inst., would say that the Drier you erected for us last winter has been, and is doing splendid work, and not giving us any trouble whatever.

After twenty years' practical experience as a brick manufacturer, using several different kinds of Driers, I must say that yours is the most rapid and the safest I have ever had anything to do with.

Before we put in your Drier we could not dry more than one million brick the whole season, and then we set them before they were fit to be set. It took us eight days and nights to burn a kiln of 186,000, and now we can burn the same amount in five days and nights and have much better brick. We use a bastard fire clay and ochre, half and half; the brick are dried BONE DRY and without a crack.

You are at liberty to refer to us.

Very truly yours,

GEO. SHAFER, Supt.

Railford Brick Co.

OUR NEW CATALOGUE No. 35

Just out, contains a great many indorsements fully as emphatic as the above. A perusal of them will satisfy you, we believe, that every claim made for the STANDARD DRIER is verified by actual work. It also illustrates and describes our Equipment, including our new Steam-Saving Appliance, and will prove profitable reading. ARE YOU INTERESTED? MAY WE SEND YOU A COPY?

If You Want the Best Drier for the Least Money Don't Fail to Consult Us before Buying

The Standard Dry Kiln Co., 186 South Meridian St.,
INDIANAPOLIS, IND

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVII.

INDIANAPOLIS, IND., FEBRUARY, 1897.

No. 2.



OFFICIAL REPORT.

Proceedings of the Eleventh Annual Convention of the National Brick Manufacturers' Association of the U. S. of A.

PRESIDENT R. B. MORRISON, of Rome, Ga., called the Eleventh Annual Convention of the National Brick Manufacturers' Association to order at 2:45 o'clock, Tuesday, Feb. 2, 1897, in the main hall of the Builders' Exchange, Buffalo, N. Y., some two hundred members being present.

President Morrison: The first number on our programme is a prayer by the Rev. E. P. Hubbell.

Rev. Dr. Hubbell: Let us pray. Our Heavenly Father, we are glad, in the first moments of this Convention, to bow reverently before Thee, and acknowledge Thee as the giver of every good and perfect gift. We thank Thee for the great profession represented here; we thank Thee that back in the dawns of history we find that men engaged in the same kind of work in which these are specially interested. We bless Thee that in the cities of the land there are yet the mementoes, the remains, the records of those that toiled to build up the centers of the old civilization.

We thank Thee that in this advanced age, from the crude beginnings of molding the clay and drying it in the sun, we have come to the time when the most skilled power of the best chemists is needed that we may

have the very best results. May Thy blessing rest upon this Convention, and as there shall be interchange of thought and opinion and experience, grant that these men may go back to their work, remembering the great part they have taken in the building up of the great centers of the civilization in which we live, on the very threshold of the twentieth century, and we pray Thee that better men and better material may be brought forth as the result of this gathering.

Oh, Father, overrule in all discussion. May new thought and new inspiration to do our level best in our special callings come to us all. We thank Thee for the success of the meetings of the past, and pray that this may be the best, most profitable of all. Pardon all of our sins, and give us broad views, and enable us to know Thee and to love Thee, and to know the opportunities of the times in which we live and the possibilities within our reach. And by and by, when the work of life is done, bring us to the City not made with hands, eternal in the heavens, through Jesus Christ. Amen.

Secretary Randall: The next in order, according to the programme, is the enrollment of members, followed by the roll call. That feature, perhaps, might well be omitted at this time, to be taken up after adjournment of this session. There are probably a good many delegates not registered as yet. We hope they will register immediately after this session, in order that we may know what amount of entertainment the local committee shall provide for. It is suggested that to-morrow or next day, as this body may see fit, a sleigh ride shall be taken about the city. The local committee is anxious that the visiting members should see their city, and to do that they wish, at your own time and convenience, that you will take a sleigh ride for that purpose. They want to know how many vehicles to order and

how much to provide for the "smoker" this evening, and we hope that all who have not registered will do so after adjournment.



R. B. MORRISON, Rome, Ga., Ex-President National Brick Manufacturers' Association.

President Morrison: The next number is an address of welcome to the National Brick Manufacturers' Association in behalf of the city of Buffalo, by his Honor, Mayor Edgar B. Jewett.

MAYOR JEWETT TENDERS THE FREEDOM OF THE CITY.

Mayor Jewett: Mr. President, and Members of the National Brick Manufacturers' Association—It affords me great pleasure to meet you this afternoon on the occasion of your Eleventh Annual Convention, and in the name of the people of Buffalo I extend to you a sincere and cordial welcome to our city.

We are glad to have with us the representatives of this great association of manufacturers, and trust that your stay in this city will be pleasant, profitable and enjoyable to all.

This country has been passing through a pretty severe siege during the last three years, and I know that the brickmakers have felt the depression in common with all other business men, but we are looking forward to a steady improvement under the incoming administration, and I trust that you will be among the first to receive the benefit of it.

In our own city we have felt the depression, but I think it has not affected us as much as it has many other cities in this country. Our lake commerce during the past year was the greatest that it has ever been in the history of the city. This is a most important feature of our growth and prosperity. It is not generally known, but it is a fact that the volume of our traffic is exceeded by only three ports in the world, whether situated on fresh or salt water.

The city of Buffalo has a splendid location, and we look forward to a brilliant future. I would like to have you, during your short stay among us, look around the city as much as possible, and gain for yourselves a knowledge of its many attractions. It does not show up as well at this season of the year as it does in summer, when the grass is green, the trees are in bloom and the temperature is balmy and delightful; still, it has many attractions, and I trust they will not escape you.

I know that you will be hospitably entertained by your brethren in this city, and that you have taken no chances in committing yourselves to their hands for a few days.

Again I extend to you a most cordial welcome to our city, and trust that you will find it so pleasant that you will be glad to come to us again. (Applause.)

Secretary Randall: There is another representative citizen of Buffalo here who desires to say a word or two of welcome on behalf of the Builders' Exchange, whose guests we are this afternoon. I will take the liberty myself of introducing Mr. Henry Rumrill, Jr., President of the Buffalo Builders' Exchange.

A BUILDER'S WELCOME.

Mr. Rumrill: Gentlemen of the National Brick Manufacturers' Association—The Builders' Association Exchange of Buffalo most heartily welcome you, and extend to you the hospitalities of our Exchange, and our members will do all they can to make your visit a pleasant one while you are with us. We trust that your deliberations will be of great benefit to the vast industry which you represent, and that after you leave Buffalo and go to your homes, and look back upon your meeting in this city, you will think of it as one of pleasure and of profit. You often hear the expression that Mr. So-and-So is a "brick," and that means he is an all-around good fellow, and I see that the various cities represented in this Convention have all sent their sample bricks.

I want to take this opportunity of calling your attention to the fact that you are to be our guests this evening at an informal "smoker," to be given in these rooms at 8 o'clock, and we want you to come prepared to enjoy yourselves and have a good time. (Applause.)

Secretary Randall: To relieve our modest President of a little embarrassment, I am going to take the opportunity of introducing him myself. The next number on our programme is

the President's address, by Mr. R. B. Morrison, of Rome, Ga.

President Morrison then read the following address:

PRESIDENT MORRISON'S ADDRESS.

Gentlemen of the Eleventh Annual Convention:

I wish to congratulate you on your good fortune in being able to meet in this magnificent city, the "Electric City," whose source of power, like the hospitality of our Buffalo brethren, is unlimited and inexhaustible. The central location of your city, when considered in a broad sense, makes it a most desirable place to convene. Our membership is not confined to our own country, but includes on its roster citizens of other countries, not only in America but in Europe. We meet here at the door of our neighbor, the great Dominion of Canada, an empire greater in territorial extent than our own Nation. There are direct lines of travel by rail and water to the Mother of Nations, and within easy distance of most of the great cities of the East, West and central portions of the country.

At the beginning of the present century the wild beasts roamed unmolested the forests that stood upon the site of this beautiful city, with its hundreds of miles of well paved streets and avenues, bordered by magnificent business buildings, cottage homes and stately mansions, with its large commercial and manufacturing interests—a monument to the genius of our republican institutions, and to the energy and enterprise of American citizens. Not satisfied with this truly great achievement, you have levied tribute on the mighty forces of Niagara, and hereafter at touch of the magic button a great Genii will appear to perform miraculous feats at your behest; in an instant he will cause the lamps of your city to rival the stars in brightness and start the wheels of your great industries to rolling, carrying your business men to their offices and your laborers to their work. Who can foretell the results to your city of this matchless force at your disposal? Great has been your progress in the past, but a greater future lies before you.

In behalf of our Association, I thank you for your kindly and cordial welcome, and I feel sure that every visiting brickmaker, like myself, will ever feel grateful toward the porter that "Put Me Off at Buffalo." It is gratifying, indeed, to meet so many members here, to see old friends, to feel their warm grasp, and hear their friendly greeting, and to form new acquaintances, that will ripen into enduring friendship.

In the midst of our rejoicing there mingles a tone in the minor key. We realize that we are not all here. Some have grown weary of life's battles and fallen asleep by the wayside. Since we met at Atlanta, death, with his icy hand, has touched the old, the young and the middle aged among our membership. Their places are vacant to-day, but they still live in memory's sacred realm.

This year has been an eventful one. Although times might have been better, they could have been worse; if business was dull, politics were lively. This, following as it did two years of business depression, we could not expect the presidential year to improve, as parties differed radically in their financial views and results were uncertain. This great question having been practically determined and confidence, in a measure, restored, warehouses, factories and stores have reduced their stocks to the lowest point; idle capital is anxious for investment; a great and enterprising people await with impatience the signal to move forward. Everything, it would appear, points to an early resumption of business in every part of our country. In our line of business, where consumers have been able to stop improvements and curtail expenses of repair even for three or four years, it is reasonable to suppose that these long delayed improvements will be among the first to receive attention when good times come. In my humble opinion we will have a fair demand for our product this year, with several years of activity to follow. This Association can, by its action in this Convention, do its share toward restoring confidence and prosperity to the business interests of our country. Let us start the ball rolling; let us forget the past and look hopefully to a brighter future; let the experience gained in the years just past be a lamp to guide us into ways of prudence and wisdom in future. If we do this, our apparent adversity will prove a blessing in disguise.

I understand that the Treasurer's report will show that we have trenched on our reserve during the past year. In order to keep our finances in a healthy condition, we must reduce our expenses, or provide for greater revenue. I do not think it would be wise to increase the annual membership dues; we cannot afford to do anything that might reduce our membership. To carry on experiments requires a considerable outlay of money, to say nothing of time. The ordinary revenues of our Association will not meet these ex-

traordinary expenses. If the regular expenses cannot be reduced it will be necessary, in order to carry on the good work we have begun, to devise means to raise additional revenue. This might be done by private subscription. In this way those directly interested in any special line of work would be willing to contribute toward a fund for this particular purpose. We may decide to experiment on some special lines of manufacture, in which, perhaps, only a small percentage of our membership are directly interested; those not interested might object to having their annual dues increased to pay these special expenses.

I wish to refer to a subject the consideration of which was recommended by my worthy predecessor at our last meeting; that is, the low prices that prevail in many places. Even if it was in my province to discuss this question at this time, I would not care to undertake it. That it is an important issue will not be denied. If competing brickmakers would act in harmony we would, at least, get fair prices for the brick we sell. Competition is said to be the life of trade; if carried too far, it is fatal to it. If the wisdom of this Association can evolve a scheme with sufficient elasticity to meet varying conditions in different localities and sections that will prevent competing brickmakers from forming a mutual society for the extinction of profits it will be hailed as a benefactor by thousands of struggling brickmakers.

Permit me to call attention to another subject of interest to our Association that has been discussed recently by several writers in our trade journals, "Can we increase the demand for our product by opening new fields for our wares?" We should specially try to reach the home builders of our country, and impress upon them the importance of using durable fire-proof material in the construction of their dwellings; they should not sacrifice comfort and safety for mere appearance. I trust you will give due consideration to this subject in its various phases. It might be best to refer the subject to a committee to consider and report means for the accomplishment of this object.

We have on our programme a variety of interesting subjects to discuss, and even a brief consideration of each will require every minute of time during our three day's session. We will have no time to waste. You will pardon me for a suggestion bearing on this subject: If each member will read the programme carefully and note the numbers in which he is particularly interested and liable to take part, give these some thought, and when occupying the floor let ideas converge into words, in this way we will be able to get through the whole programme, and not be compelled to hurry through the last numbers, some of these being the very best in the programme.

I shall in a few minutes retire from the presidency of this Association. Before doing so I wish to extend to the members my sincere thanks for their aid in the administration of this honorable office, and for the uniform courtesy that has been extended to me at all times during my term of office. Our organization has passed through these years of financial depression in splendid shape. It has proven itself worthy of perpetuation. The coming of business activity will put new life into our Association, and with the rich experience of the past to guide us, we should move onward and upward, with firm confidence in our ability to accomplish the purposes for which we were organized. (Loud applause.)

Secretary Randall: Next on the programme, gentlemen, we have the report of our Treasurer, Mr. John W. Sibley, of Coaldale, Ala.

TREASURER SIBLEY'S REPORT.

To the Officers and Members of the National Brick Manufacturers' Association:

Gentlemen—I hand you herewith a statement of the receipts and disbursements on account of the Tenth Annual Convention. I regret to have to report to you that for the first time our expenditures have exceeded our income—in this instance \$124.44. This, however, was due in a large measure to the costs of lawsuit by a fakir at the Atlanta Exposition for alleged infringement of his patent in the design of our badges.

You all doubtless remember the edifying and glowing verses contributed by the many gifted poets among our membership as a triumphant battle song for our victorious "March Through Georgia." It is, therefore, with a feeling of peculiar gratification that I (a former citizen of the "Goober-Grabber" State, where the hills are infested with "Blind Tigers," "Free-Will Baptists," "Coons" and other "Life-Preservers") inform you that our genial Secretary was not "taken in" by any "Georgia Cracker," but by an

unscrupulous foreigner, who evidently desired to make more frigid the reception the Woather King gave to our braves on that occasion.

But it should be comforting to note that despite this raid upon the treasury our honor has been perserved and our gold reserve today stands far in excess of the danger mark. Respectfully submitted,

JOHN W. SIBLEY,
Treasurer N. B. M. A.

RECEIPTS AND DISBURSEMENTS.

ACCOUNT OF TENTH ANNUAL CONVENTION OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION.

—Receipts.—

Balance in treasury, account 1895.....	\$418.55
Paid Paving Brick Commission, 1895.....	95.79
Net balance account 1895.....	\$322.76
Membership fees, 275 at \$2, account 1895 and 1896.....	550.00
Membership fees, 27 at \$5, account 1895 and 1896.....	135.00
Total	\$1,007.76



WM. H. BRUSH, President, Buffalo, N. Y.

—Disbursements.—

Paid for 1,000 programmes, mailing, etc.....	\$32.40
Paid for 450 Official Report, mailing, etc.....	206.50
Paid for hall rent, etc.....	55.50
Paid for Freight Paving Brick Commission.....	34.67
Paid for postage, stationery, etc., for Secretary.....	69.50
Paid for Secretary's traveling expenses.....	250.00
Paid Assistant Secretary.....	50.00
Paid for copying papers, etc.....	8.50
Paid for badges, etc.....	102.37
Total expenditures.....	\$809.44
Balance in treasury.....	198.32
Total	\$1,007.76

President Morrison: Gentlemen, you have heard the Treasurer's report. What disposition will you make of it?

Mr. E. M. Pike, Chenoa, Ill.: I move that it be adopted and placed on file.

Motion put and carried.

Secretary Randall: The next on the programme is the election and installation of officers. I suppose the election will come first and then the installation; that is our usual course. The Constitution, as our older members know, requires an elec-

tion by ballot. That formality may be dispensed with when there is a unanimity of action; so, if you can reach that sort of action, and vote to suspend the rules and authorize the Secretary to cast a unanimous ballot, it will save the trouble of an individual ballot.

Mr. Cunningham: A great many of the members of our Association may not be aware that some members of our Association are hat traders. If there is anybody in the Convention who wants to trade a new hat for an old one, I will accommodate him.

President Morrison: I have been trading that way for some time, but have decided that I will not do it any further.

THE ELECTION AND INSTALLATION OF OFFICERS.

Mr. Adams: My esteemed friend who spoke about the hats should, when he comes to Buffalo, do as the Buffalonians do—take the best thing he can find, and say nothing. I now desire to place in nomination for President of this Association a gentleman well known to us all, and while it would afford me pleasure to preface his nomination with well-deserved words of praise, knowing him to be a modest man, reticent and retiring, I will not indulge in any flight of oratory, but say that the surroundings are so in harmony, everything seems to be in keeping with the nomination of the gentleman whose name I shall present, that it is not necessary to preface it with any further remarks. I place in nomination Mr. William H. Brush, of Buffalo, as President of our Association.

Captain Crafts: I rise to second the nomination of Mr. Brush. I have heard of but one foolish act on his part, and that was when he nominated your honorable servant for Vice President of this Association in Indianapolis. I move that nominations be closed, and that the Secretary be instructed to cast the unanimous ballot of this Association for Mr. Wm. H. Brush for President.

Mr. Pike: I second the motion most heartily.

Motion put and carried unanimously.

President Morrison: The Secretary has cast the ballot for Mr. Brush, of Buffalo, and he is elected President of the Association for the ensuing year. (Applause.)

President Morrison: Nominations are now in order for First Vice President.

Mr. Purington: I nominate Prof. Edward Orton for First Vice President of this Association. I do not want to make a speech on this subject, but those of you present know as well as I do that he has been of great assistance to us, and if you knew what he had done for this Association in the past year you would join with me in feeling that his services have been very valuable to us, and I think he is entitled to an election or promotion.

Mr. Gates: I most heartily second the nomination.

Prof. Orton: I am thankful to those gentlemen who have spoken in my behalf, and appreciate the kindness of their feelings in the matter, but it seems to me it is scarcely proper to elect me to this high position. I think the higher offices of this Association properly belong to brickmakers. I was a brickmaker once, but stepped a little bit out of the line, and, while I am trying to tag on behind the procession to the best of my ability, I would prefer to see a genuine, full-fledged brickmaker, who makes bricks every day in the year, or as nearly so as possible, elected to the office of First Vice President, and therefore request that you will nominate some one else.

President Morrison: I think that is a matter which ought to be left with the Convention. I do not think that we can consider your preferences in the matter, Prof. Orton.

Mr. Gates: I move that the Secretary be instructed to cast the unanimous vote of this Association for Prof. Orton for First Vice President.

Motion seconded and carried.

President Morrison: The Secretary having duly cast the ballot, Professor Orton is elected your First Vice President for the ensuing year. Nominations for Second Vice President are next in order.

Captain Crafts: The State of New York extends so far east that I would propose to put in nomination a gentleman from the eastern fringe of the State—Mr. Edwin Brockway.

Mr. Brockway: I would prefer that some other member of this organization be made Second Vice President.

Captain Crafts: We did not ask you what you preferred.

Mr. Brockway: I have had very little to do with your organization. I prefer you should take some other member.

Mr. Purington: I second the nomination of Mr. Brockway, and move that the Secretary be instructed to cast the unanimous ballot of the Association for his election as Second Vice President.

Motion put and carried.

President Morrison: The Secretary has duly cast the ballot, and I declare Mr. Brockway, of New York, elected Second Vice President for the ensuing year. The next nomination will be for the Third Vice President.

Mr. Eudaly: I nominate Mr. George T. Dickover, of Wilkesbarre, Pa., for Third Vice President.

Mr. Eggers: I second the motion.

Motion put and carried.

President Morrison: The Secretary has carried out the instructions of the Association and deposited the ballot for Mr. Dickover, who is duly elected. The next business is the nomination of a Secretary of this Association.

Mr. Pike: I think it is just as well to change this thing around, and get some other fellow from some other part of the country, but seeing that we have had a good Secretary, I presume that we will have to continue him along that same line again. We cannot get rid of him; he is a necessary evil; we have got to have him, whether we want him or not, and I move that we take a man from Indianapolis this year, and his name is T. A. Randall.

Captain Crafts: I second the nomination, but not the scandalous remarks.

President Morrison: You can probably pick some flaws in Mr. Pike's language, but he comes out all right in the end.

Mr. Pike: I move that the President cast the vote of this Association for Mr. Randall as Secretary for the ensuing year.

Motion put and carried.

President Morrison: The motion is carried unanimously, and I have cast the ballot for Brother Randall, who will be your Secretary for the ensuing year. The next in order is the nomination of a Treasurer for the ensuing year.

Mr. Eggers: I desire to place in nomination for that office our worthy Treasurer, who has fulfilled his duties so faithfully and always has a reserve, you know—Brother Sibley, of Alabama.

Mr. Adams: I offer an amendment out of my heart that Mr. Sibley be made Treasurer for life. Most of us have been fighting deficits all of our lives, which brings gray hairs and sorrow, and tidings of anything but comfort, and any Treasurer who can evolve a surplus from a deficit is my huckleberry. (Laughter.) I second the nomination.

Mr. Purington moved that the Secretary cast the ballot for Mr. Sibley as Treasurer of the Association.

Motion put and carried.

President Morrison: The Secretary has cast the ballot, and Mr. Sibley is elected Treasurer for the ensuing year. I am glad, indeed, that Brother Sibley has been elected. The installation of the officers is now in order, and I will appoint Brother Purington, Brother Adams and Brother Pike to conduct the newly-elected President to the chair.

President Morrison: Gentlemen of the Convention—In retiring from the presidency it is some consolation to know that such a distinguished and worthy brickmaker as my friend Brush has been elected to fill this high office. I have the pleasure, gentlemen, of introducing to you Mr. Wm. H. Brush, of Buffalo, as your President for the ensuing year. (Applause.)

PRESIDENT BRUSH TAKES THE GAVEL.

President Brush: Gentlemen—I am deeply grateful for this

honor, no matter if it did come to me through local possibilities, as long as I was backed up and escorted by three such able-bodied men as your President appointed. With such a body guard I had no difficulty in arriving here as your Chairman. I trust that you will bear with me and be charitable to me if I should develop a few shortcomings. It is a good many years since I had the honor of presiding over a deliberative body—in fact, not since my school days. But I will try to do the best I can, and at least hope to make it pleasant for you while here in our city. What is your further pleasure? (Applause.)

Secretary Randall: The next thing in order, gentlemen, to assist our newly-elected President in his first hour of difficulty is the installation of the First Vice-President.

President Brush: I will appoint Messrs. Eggers and Penfield a committee to escort the First Vice President to the chair.

Professor Orton was escorted to the platform by the committee and formally introduced to the Association by President Brush.

Prof. Orton: Mr. President and Members of the National Brick Manufacturers' Association—You have all of you—a good many of you, at least—witnessed on former occasions that I am not much of an off-hand speaker. It was the part of my early education which was neglected, and I do not know that I am gaining facility in that direction as time goes on. But I cannot let an occasion of this sort pass without an attempt at least to express to you the warmth of my feelings as I take possession of this high office which you have conferred upon me.

The National Brick Manufacturers' Association is an organization which has been much in my mind for the past year. I know of no other organization in the country which is its exact parallel. It is a business organization, composed of business men, men who are active and pushing in daily life, yet, as self-appointed delegates, they find time, in the course of their year's work, to come—many of them very long distances—to exchange views on the purely technical part of their work. As I say, this is an Association which is nearly without a parallel in the country so far as I am aware. We have scientific associations, I am proud to say, in the United States which are second to none in the world. The literature of our technical engineering societies ranks as high as any coming from foreign shores; but this Association of Brick Manufacturers is not composed, as these other associations are, of men who devote their lives to purely scientific work. Taking the engineering associations of the country, they are composed almost wholly of engineers, and these, in turn, are subdivided into narrower specialties—civil engineers, mining engineers, electrical engineers and sanitary engineers, and still others. They branch out in this manner until each man is connected with a select coterie who represent his exact phase of thought. In this Association, on the contrary, we assemble to represent an industry covering a wide range of territory, manufacturing widely different wares, but with the effort to learn and help one another to learn the technical secrets of our industry.

I must say that I am proud of the record the Association has made in the past, and, above all, am I proud of what I think the capabilities of this Association are for the future. It seems to me that we have accomplished a vast deal of good in our ten preceding gatherings. It seems to me that, following the line established in the last two or three years, we have still broader fields to conquer and higher fame to achieve, and it is to that I shall devote my efforts in the succeeding year. I thank you once more for the gift of the honorable position of First Vice President of this Association. (Applause.)

Mr. Bloomfield: I notice a delegation of ladies outside the meeting room door. I move that the doors be opened and they be invited in to listen to the proceedings.

A PLEASANT INTERRUPTION.

Motion put and carried, and the proceedings were suspended while some thirty or more ladies were admitted and provided

with seats in the front rows, where they remained interested spectators during the balance of the session.

President Brush: The next business in order is the inauguration of our Second Vice President, Mr. Brockway. I appoint Brothers Gates and Bloomfield a committee to escort him to the platform.

Mr. Brockway was then escorted to the platform and introduced by the President.

Mr. Brockway: Mr. President, Ladies and Gentlemen of the Convention—You must excuse me from making a speech. I am no speechmaker, but I am grateful and thankful to you for the honor you have conferred upon me. While I may run short in my ability to make speeches, I hope to make up for this shortcoming in the way of active work for the good of the Association during the coming year. (Applause.)

President Brush: The next order of business is the inauguration of our Third Vice President, Mr. George T. Dickover. I appoint Mr. Eudaly and Mr. Chambers a committee to escort the gentleman to the platform.

The gentlemen named, with much ceremony, escorted Mr. Dickover to the platform.

President Brush: Ladies and Gentlemen—Allow me to in-



EDWARD ORTON, JR., First Vice-President, Columbus, Ohio.

troduce to you Mr. Dickover, of Wilkesbarre, Pa. The committee which escorted him are very tired, and we will detain them but a few moments.

Mr. Dickover: Mr. President, Ladies and Gentlemen of the Convention—I have nothing to say more than that I thank you for the honor conferred on me.

President Brush: I believe that the next inauguration is that of the Secretary. I do not think you know him, and I will have to introduce you to Brother Randall, the newly-elected Secretary, whom we expect to do something for us this year. (Applause.)

Mr. Randall: Mr. President, Ladies and Gentlemen—This is an unexpected pleasure, to talk to so matinee-appearing an audience. I did not expect this pleasure, or might have prepared an address. I appreciate highly, indeed, the honor that you have conferred upon me in this re-election. The common-

place remarks are getting a little threadbare along this line, but it is pleasant to smile with you each year, as I do on these occasions—and other occasions. (Laughter.) We have heard a great deal during the past year about the lack of confidence. I am confident that we are gaining confidence. When I look into the faces of this audience and see the number of young men scattered among the older members, I am assured that, with the addition of these bright, ambitious members, we can well look with confidence to the future of our work. With that impression, I shall go on with the duties of this office with new courage and increased effort. I thank you. (Applause.)

Mr. Carter: The gentleman makes no allusion to the ladies here.

Captain Crafts: He did, but he spoke of the ladies first, and not last.

The Secretary: I said I was not accustomed to talking to such a matinee-appearing audience. I know that the ladies appreciated that part of my acknowledgment.

President Brush: I will appoint Mr. Endaly and Mr. Chambers a committee to escort the newly-elected Treasurer to the platform.

Mr. Sibley: Mr. President, Ladies and Gentlemen—I assure you I appreciate very much this additional mark of esteem in having elected me for the fourth term, having already served one more term than my distinguished friend and your fellow-citizen, Grover Cleveland. I felt sure you would "put me off at Buffalo." I want to thank you for this additional election, and if any of you are unfortunate enough to indulge too much in the personal freedom that has been extended to you, and run short of cash, if you will call on the Treasurer with United States bonds, he will discount them at 50 per cent. (Applause.)

Secretary Randall: Mr. President, having finished the installation of officers, the next business is the appointment of committees. There is but one committee, I believe, that has so far been considered. I have a resolution here, offered by Mr. Purington, which I will read:

Resolved, That a committee of five members be appointed a Committee on Resolutions, to whom shall be referred all resolutions offered, and who shall report at the last session of the Convention.

I suggest as an amendment that the Chairman appoint the committee at his convenience, and announce subsequently the Committee on Resolutions.

Mr. Eggers: I move the adoption of the resolution as amended.

Motion put and carried.

President Brush: The next business in order is a paper, "The Old, Old Story," by Mr. O. J. Swegles, of Buffalo.

THE OLD, OLD STORY.

Memories of sweet long ago,
Halcyon days full of glory.
Steal over the pathway of time.
As I write of The Old, Old Story.

Gladness and sadness linked.
Frost and famine and worry;
Cheeked out on the installment plan,
As I write of The Old, Old Story.

Competition in business, dull times,
Goods below cost in the category;
Failures in endless numbers appear,
As I write of The Old, Old Story.

Business way below ebb tide,
Collections but a dream of worry;
Overproduction the cause of all,
As I sum up The Old, Old Story.

Better times dawning again,
Ah, the past reflects scenes gory;
With false booms and speculation,
As I sum up The Old, Old Story.

Every decade we've been checkmated
With Anarchistic dreams of fanatic and tory;
Political upheavals and business wrecks,
As I sum up The Old, Old Story.

Booms, ah! the new-born causes—
Fleeting sunbeams of hypnotized glory,

Bring wealth to few, destruction to many—
How truly, The Old, Old Story.

Bricks, gentlemen, bricks, they say, were manufactured over three thousand years ago, but they were sun-baked by the Romans.

When Brother Randall visited this city a short time ago he insinuated that a full-fledged Buffalo brick wasn't made that way. For proof of his assertion he intimated that friend George W. Schmidt was the only modern gold brick in town having a guaranteed capacity of 12,000,000 Raines law bricks per day; and that he was the gentleman of all the others to describe how he felt at this meeting. Unfortunately, Schmidt positively declined the honor at the last moment on account of clay gout or something of that nature, and as a final resort I had to fall into line with this paper.

One short year ago we had in this city a Brick Manufacturers' Association, which had worked well for a number of years and secured to its members a fair price for their material, but in an evil hour the ties which bind were broken, then it was every man for himself.

Well, prices went to the dogs, below zero mark, as it were, and the buyers reaped a rich harvest at our expense. Fact, we have paid dearly for our experience in Buffalo, truly The Old, Old Story. But away with financial perplexities; in life in the brick business is what we make it.

I recently discovered among the archives filed away brief biographical sketches of some of the most distinguished brickmakers of this city, giving time and place they were made brickmakers. The "Brush" family enjoy the distinction of being classed among the pioneers. The elder William C. Brush inaugurated his career in bricks over sixty years ago with pronounced success. At about the same date he commenced variegating the monotony by contributing to the Buffalo census twelve healthy and vigorous brushes, not singly but in pairs, with which to perpetuate the line of brick-makers for years to come—a blue ribbon for the gallant pioneer.

The next in line is Mr. Lewis Kirkover, a Napoleon in the industry. Although not born a brickmaker, he engaged in the business fully half a century ago, and is classed among our substantial citizens. Truly clay diet seems to have agreed with this distinguished gentleman, for now, at the ripe age of nearly seventy-five, he is contemplating branching out into real estate realms with all the briskness of a colt. His old brickyard is being leveled off, and will soon be laid out into streets and filled with modern houses. A quartet of combinations have served to make his life replete with happiness. First, brick; second, a good square meal; third, a cracking good horse, and last and most of all, a handsome woman.

The third patriarch of all is the ever popular Charles Berrick. Many of the metropolitan business blocks in this progressive city are but living monuments to his memory. Way back in the sweet long ago he laid brick for a livelihood in the home of his youth in England. Upon locating in this city, when the port at the foot of the great lakes was in its infancy, he soon laid the cornerstone of a most successful business career through enterprise and push. His capital stock consisted mainly of a good appetite and a constitution for hard work. To-day the name of Charles Berrick is a synonym of integrity and as familiar to Buffalonians as a household word. His two industries, known as the North and South brickyards, are operated at present by his sons, Alfred and John, worthy representatives of a self-made man.

And now I come to the well-known Dietschler family, Henry, Sr., and Henry, Jr., and John. The father commenced business back in the sixties, and prosperity has crowned their ever faithful efforts. The result of their industry may be seen in many of the handsome buildings which ornament our city.

George W. Schmidt was born a brickmaker, and his earliest recollection dates back to the time his mother warmed the seat of "learning how to be better" with a clay shingle for not tempering his clay to that exact nicety required in those days of hand-molding.

There are others, but I have been admonished by the Secretary that time, instead of brick, is money. The truth of the matter is, we only have a few gentlemen engaged in the brick-making industry in this city, and they have lived on a clay diet, which has been so healthful that I can only explain my ultimatum with a story.

A city temperance lecturer visiting a country village once upon a time was dumfounded to see so many gray-haired men about town, and asked one of them, a Mr. Jones, how old he was. "Ninety," came the quick response, "and dad over yonder in the field is 112, with

also a number of his neighbors ranging along in the nineties." The question was then asked: "Do any of the people that live here ever die?" "N-o-p, not in my recollection; they jis live along till they get so old they dry up like brick dust and blow away." That is the end of an old, old story. (Loud applause.)

TRADE CONDITIONS—GENERAL DISCUSSION.

President Brush: Ladies and Gentlemen—After hearing this very unique and poetic effusion of our fellow-townsmen—it is something which should be encouraged, and is well deserving of approbation—we would ask Brother Gates, of Chicago, to tell us what he thinks about it.

Mr. Gates: I have had an uneasy feeling ever since we changed the Chairman of this meeting. As long as I could sit in a back seat and knew right where our former Chairman was, I enjoyed a comfortable feeling, but since he has left the platform I have been thinking in which part of the room my hat was and in which part he might be, and have been considerably broken up. (Applause.)

When I called Mr. Randall's attention to the fact that my name did not appear on the programme to-day, he said that the only way to rectify the omission was to put me on to follow the first article. Of course, I had no idea that I was to follow a natural-born poet. I had even forgotten what the subject was. I was, of course, feeling somewhat comfortable to know that the slight omission was to be rectified, but before sending in my card to the reporters so that they should not make any mistake in the name I picked up the programme to see what the subject was, and found that I was to lead the discussion of "The Old, Old Story." Mr. Chairman, I never successfully told the old, old story but once—not successfully. (Laughter.) It would not be proper to give a rehearsal of that, especially in view of the fact of the large delegation of ladies which filed in recently. (Laughter.) Then the thought of the little woman way down on Mobile Bay came to me, and I wondered what she would think of me if I rehearsed that one successful effort—I do not mention the unsuccessful efforts. I nearly fainted at the thought of it, and I asked Brother Adams what I had better do, and he said I had already convinced most of the people that I knew nothing about clay; that he was satisfied I knew nothing about finance, and that was the thing to talk about.

I attended a meeting the other night, and there was a story told illustrative, to my mind, of the subject before us. I pick up these stories from time to time in that way. This story was about an old Kentucky colonel, and the person who told the story prefaced it, better than I can probably, by locating it down in the blue-grass hills, that are so famous for fast horses and pretty women, for blue grass, hilarity and hospitality. The Colonel lived about five miles from Louisville, and used to travel back and forth with his faithful old nag. There is a certain habit which pertains to colonels, as well as others than colonels, both in Louisville and other places as well, though the general supposition is that Louisville contains more of the particular ingredient which appeals to a colonel's weak spot than any other place in the United States. On one of his trips he became engaged in a heated political discussion, during which he indulged in so many potations of that particular ingredient for which the town is famous that his health became somewhat impaired, and while he was busy in this regard a number of the youthful citizens of Louisville who knew of his weakness took off the wheels of the buggy and transposed them, putting the large wheels on the front axle and small wheels on the rear axle. This slight change in the arrangement of the wheels was not noticed by the Colonel when he began his trip in the darkness of the night, and no historian has told us what occurred. The Colonel was always reticent about it himself, and, indeed, it is reasonable to suppose that he took no notes. The only thing we do know about the matter is that when he was taken to task by his faithful wife when he arrived at home, late at night, he replied: "Why, I tell you, Mary, it's a long, long way from Louisville, and the surprising thing is it is up hill all the way." (Laughter and applause.)

While I am sure none of us has been in the condition of the Colonel as to the ingredient he had been taking, still, during the past few years many of us have been, financially, in the position of the Colonel—the big wheels have been on the front axle; it has been up hill all along and all the time. In times of this kind it is very striking to me that a body of men, such as we find here, a body of captains and generals, who represent a large number of men dependent upon them and under their control—not only the men, but the loved ones of those men in their employ, making an army of people dependent on the gentlemen gathered here—that you gentlemen could maintain your affairs and keep your plants in existence; that you could stay upon the surface of the earth, and I rejoice that you have fought through the battle, and I draw much encouragement from the fact that any one who was able to fight the battle through and stay on the surface of the earth during the times that we have had, and is able to face now the dawning of prosperity, as I know we are going to face it, is to be congratulated. I know anybody who can go through that experience has a bright future ahead of him, and I think the growth



EDWIN BROCKWAY, Second Vice-President, Fishkill-on-Hudson, N. Y.

of this institution will be marvelous from this time on. I think we are standing right on the edge of a business boom. I know hard times is the cry, but I believe the boom is coming; and I think the fact that we have gone through all of this in the past will be the most gratifying basis of the future prosperity which is to come. Any one who has gone through what we have had in the past can go through anything that is to come.

I thank Brother Adams very much for helping me out of the first predicament I was in. I never could attempt any such thing as Brother Randall prepared for me. Another point was that he did not dare put my name on the programme, because people would not come, but I think he had another little idea in that, and that was that he would hedge me off from making any remarks in the evening. (Applause.)

President Brush: Having heard from the West, let us hear what the East has got to say. I now call upon Mr. Manson, of Boston, to say a few words on the subject of the paper.

Mr. Manson: Mr. President, Ladies and Gentlemen—I think, perhaps, it would have been better if our honored President had called upon some of the Eastern manufacturers, rather than

upon me, to talk of the East; but I will do the best I can under the circumstances. While I am not a manufacturer, yet I have been brought in quite close touch with every side of this question, and have heard a good deal of the complaints that have been uttered on every side in the last two or three years. Of course, the manufacturers of the East have, in a general way, had the same cause for complaint and discouragement in their business that the manufacturers of the West have had. But I think, in spite of that, our general business there has shown a better state than it has in the West. Goods have moved, prices have been low, and the profits in many cases whittled down to the other end, but still there have been dispositions made of large quantities of brick, and the future looks full of hope and of promise. I think that there is one point which in the East has been full of encouragement, and that is, there seems to be a tendency among the architects and those interested in buildings to use a better grade of goods than they have before. They seem to have realized that the saving of a few dollars at one end of the line meant the ultimate expenditure of a good many dollars or dissatisfaction at the other end—that is, that a good brick or good clay materials put into a building, even though they cost a little more money, would bring better results for all time. I think some of the manufacturers down there have felt that also, and have been encouraged to turn their attention to upholding the best grade of goods possible, and I am glad to say that some of the manufacturers who have done that have reaped the returns, and have had their goods chosen in the face of a slight advance in price. Mr. Gates has touched so ably on the continuous up-hill life of the past year that it does not leave much for me to say on that score; but I think that I speak considerably when I say that down through the East we are looking most hopefully for all that he has proclaimed for the West, and that good times, we feel sure, are upon us. (Applause.)

President Brush: We have a gentleman with us to-day from Montana. I think you will all be interested to hear what he has to say of the good, prosperous times there.

Mr. Charles Bray: Mr. President, Ladies and Gentlemen of the Convention—I am a long ways from home, it is true, but I do not know that I can enlighten or entertain you very much. We have had the same hard times out there that have been experienced in the East, I suppose, although we are looking forward to improvement, but for the past three years things have been anything but bright. Prices have been low and the demand very small. Of course, with Montanians, the people in the mining States, their hope is gone now on account of the silver question. (Laughter.) We will have to see now what is in store for us on the gold basis, and whether that will help us out. I have been called upon unexpectedly, and am not prepared to say anything of any account. (Applause.)

President Brush: We would like to hear now from Mr. Lewis Oliff, of Louisiana.

Mr. Oliff: I think the gentleman who was speaking a few moments since stated the case about as we have it down South; but I can tell you that in the town where I am located last year was the most prosperous we have ever had. We happened to have a railroad come into our town, which gave us plenty of work, and the prospects of free silver out West helped us until the matter was settled in November. The talk of free silver helped our business, and made it bright while it lasted, but it lasted only a short time. I think our prospects for this year are as good as they were for last year. It looks to me as if everything is going to sail smoothly. We have an abundance of cotton this year, and an advance of $1\frac{3}{4}$ cents over what the price was two years ago. The planters in our country use a great many bricks, and when they have a good season their wagons are constantly calling at our yards. I have had fifty-seven wagons at our yard in one day, loading with brick, during the past year, and I did not have as many wagons from the planters during the previous three years. As things look now, I believe the South will fall right into line, and that

we shall see a vast revival of business in that section of the country. (Applause.)

President Brush: Mr. W. S. Bowen, of Tacoma, Wash., is present, and we should be glad to have him tell us of his section of the country.

Mr. Bowen: Mr. President, Ladies and Gentlemen—This is rather unexpected. Coming, as I do, from the Evergreen State, and being unprepared and not accustomed to speechmaking, I hope you will not expect very much of me. We feel very hopeful at present. We have had an unusual amount of this depression, having suffered, before the panic of 1893, from the reaction of a too rapid development. The general depression over the country has simply augmented and protracted our agony, but in the face of it all we feel hopeful. We have prospects, I think, for the most prosperous season since 1891. Before that we had a series of years, eight or nine, of very great prosperity. I anticipated a great deal of pleasure in attending this meeting, being the first one I ever had an opportunity to attend, and I think I shall have more pleasure in hearing these gentlemen, who are better prepared to talk, than by making any further efforts in that direction myself. (Applause.)

President Brush: While we are on this calamity business I would like to hear from our ex-President from Cleveland, Brother Eggers. May be he can lift our depressed spirits.

Mr. Eggers: Mr. President, Ladies and Gentlemen—After having listened to the paper from your worthy townsman and the remarks of Mr. Gates and the other gentlemen, the idea of calling on me now to follow them, after they have taken all the thunder, is somewhat preposterous. The old story that we have heard talked about so much for the last three years—I guess all the people of the United States are tired of, and don't want to hear any more of it, but want something of the new story, and after our last contest the people of this country do expect something more than we have had in the last three years, and I venture to say that there is not a person in the United States but needs a little braeing up. Had the President called upon me to say something in the line of politics perhaps I would be able to make a speech, but, of course, political discussions are not allowed in this Association. Nevertheless, we all hope to see the shining gold, and also the shining silver, after all the great nations have combined, and I think it will give prosperity to this country and to the other countries that will join the United States. (Applause.)

President Brush: Gentlemen, are there any more of you, or the ladies, who would like to make any remarks on this paper?

Secretary Randall: There does not seem to be any desire on the part of the gentlemen present to discuss this subject further. This, I believe, completes our programme for the afternoon. We got through so smoothly and so quickly with our election, there being no contests to amount to anything, that we have had more time for discussion than we usually expect to have for our first session.

I am requested to warn the gentlemen present against indulging too heartily in the dinner at the hotel this evening. The gentlemen on the local committee say that they want us to eat something which they will have here a little later.

I believe it is understood that the ladies this evening are to be entertained by the local committee. A theater party will be given, and any gentleman who is a member of the Association, and is accompanied by one or more ladies, is requested to have the ladies in attendance at the parlors of the hotel in due season, and the party will then proceed in a body to the theater. After the theater party the committee will entertain the ladies as they see fit and proper. I am not permitted to divulge what the exact programme is, but there is a scheme on foot for a carriage ride for the ladies and gentlemen to-morrow or next day, at the convenience of the Association.

We have upstairs, on the sixth floor, an exhibition room, a room where specimen brick and samples of brick machinery and appliances used in the art of brickmaking are exhibited.

The rooms are free to the public, and any one desiring to inspect the various wares displayed can do so at his convenience.

There is absent from this meeting, for the first time in the history of this Association, a charter member, dearly beloved by all here—Mr. Ittner. I know the ladies, too, will regret the absence of his good wife, who is an honorary member of this Association, as we do his absence. I have received the following letter from Mr. Ittner:

A CHARTER MEMBER'S REGRETS.

St. Louis, Mo., Jan. 29.

To the President and Members of the N. B. M. A. of the United States, Buffalo, N. Y.:

Gentlemen—Having been present at the birth of our Association, and having attended all its meetings and being a recipient of its highest honors, imposes upon me the necessity, as I view it, of giving an excuse for my absence at this our Eleventh Annual Convention, and my deep regret in not being able to be with you and participate in your deliberations.

My excuse is sickness in my family and not really being a well man myself, as more fully explained in a personal letter to Mr. Randall, our Secretary.

Having, as stated, attended all of our previous meetings and formed many warm personal and lasting friendships, and the further fact of having in common with others been the recipient on two former occasions of that loyal, warm-hearted and open-handed generosity of the builders and brickmakers of Buffalo, I can fully appreciate what great enjoyment I miss by my absence. Hoping that your deliberations may redound to the best interests of our Association and all its members, I subscribe myself its true friend and well wisher.

ANTHONY ITTNER.

Mr. D. V. Purington: I suppose there are few here except the charter members of this Association who can fully realize and appreciate the affection Anthony Ittner has for this Association. It has been my good fortune to attend every session of every Convention held up to the present time, and I can form some slight idea of what my feelings would be were I situated to-day as Mr. Ittner is. He and I have talked about this meeting many times, and we have both looked forward with pleasure to attending these Conventions for many years. We are both young men, and there is no reason why we should not, in the natural course of events, be members of this Association for a good many years and attend its meetings. A misfortune which has overtaken Mr. Ittner in the ill health of himself and wife has prevented him from coming, and I have prepared a telegram, which I will read, and, if this Convention wills, the Secretary can send it to Mr. Ittner.

Buffalo, N. Y., Feb. 2.

Hon. Anthony Ittner, St. Louis., Mo.:

The members of the National Association of Brick Manufacturers, assembled for their Eleventh Annual Convention, have received the letter announcing your inability to be with them with sincere regret. They extend to you and your good wife their sincere sympathy for your illness and unite with you in the feeling of sorrow that a record so creditable to you and so priceless to them has been broken. They send their best wishes for your recovery.

T. A. RANDALL, Secretary. W. H. BRUSH, President.

President Brush: The Secretary is instructed to send this telegram to Brother Ittner at St. Louis.

I wish to make an announcement in behalf of our Buffalo friends. The badge which you wear will be your passport to this evening's entertainment in this Exchange. I trust you will all come. We will try to make it pleasant for you, and we will welcome you all.

I hope the gentlemen will bear in mind to attend the sessions of the Convention promptly, so that we can dispose of our business and get through with it properly. If there is nothing further, I declare this meeting adjourned until Wednesday morning, at 9:30 o'clock.

SECOND SESSION.

Wednesday Morning, Feb. 3.

President Brush called the meeting to order at 9:45, and announced the first business in order to be the reading of a paper on "Clay in Architecture," by Mr. Henry R. Griffin, of Phoenixville, Pa.

Mr. Griffin read the paper, as follows:

CLAY IN ARCHITECTURE.

Mr. President and Members of the National Brick Manufacturers' Association:

Gentlemen—In addressing you on the subject of "Clay in Architecture," I feel very much as the farmer must have felt when the calf he had lifted daily became too heavy for his strength. I have written upon many subjects, but this one is, I am afraid, too heavy for me.

Your worthy Secretary, Mr. Randall, seems to think that I have the ability to interest you, and possibly he may be correct, for sometimes the views of one who knows very little about a subject are interesting, if for no other reason than from the fact that it is extremely pleasant for the listener to sit still and think how much more he knows about it than the one addressing him.

Speaking seriously, I will state that I do not expect or hope to tell you anything about the subject that is in any way new, nor do I hope to make it especially interesting. I shall take up very little of your time, and shall trust to you to make the interest attach to the discussion which may follow upon the very few suggestions I may be able to make.

I do not propose to touch upon the artistic merit of the architectural clay work of the present day. We are told by those who ought to know that in this respect we are far behind the work of past centuries. This may, or may not, be so. If it is true, it is not from inability on our part, but must be and is from the conditions surrounding us. Neither do I propose treating the subject of archi-



GEO. T. DICKOVER, Third Vice-President, Wilkesbarre, Pa.

itecture or architectural effect. These are hardly within the province of the clayworker. His interest usually does not extend beyond his factory, and he is often uninformed as to the particular use and arrangement to be made of the goods he furnishes. The principal point in which we, as clayworkers, are interested is the one of economic clayworking, on up to date lines, and under present conditions. I propose, therefore, to confine myself to the consideration of the two following interesting and pertinent questions: What have been the changes within the past few years in the use of clay in architectural work? And what seems to be the tendency of the times?

A thorough consideration of these two questions would consume hours of your time, and probably would not answer the purpose as well as a short and crude outline. At any rate, the latter is all I think necessary to attempt, and if anything is suggested that meets with interest, it can be further developed in the discussion.

The function of clay in architecture is to-day very different from what it was ten or twenty years ago, and differs still more from what it was in earlier years. The day of the old solid construction is passing or has passed away, and the use of metal in construction, first in retaining walls and so forth, and now in the whole frame work of large buildings, has led to a complete revolution in the clay-working interests. Formerly strength and solidity were the fundamental requisites of good building material, and little

attention was paid to beauty in the majority of cases. To-day lightness, durability and beauty are the primary essentials. In former days the clay work was the building, now it is the shell, the beautifying agent, and the protector of the metal frame. To-day as many or even more brick may be sold for building construction than in the past, but they are sold under different conditions; the old contracts for brick by the millions for single buildings are rare, but, on the contrary, the demand for hollow building material has wonderfully increased, and in fact has grown from nothing into an enormous business within a very few years. This increase in the demand for hollow building material has come to stay with us for some time, and will undoubtedly further increase, and will go on branching out in new directions until its ramifications are so numerous as to defy enumeration. There is probably not one of us, even the youngest here, who cannot remember the time when no hollow building material was manufactured, or at least cannot remember when its production was practically in material. To-day we have large plants devoted almost entirely to the business, and numberless plants that engage in it to a greater or less extent.

You have all noticed the great change in our clay literature, and how terra cotta and hollow building material are coming to the front, and the examination of a clay-working machinery catalogue is simply bewildering from the multitudinous machines therein represented, these machines all being necessary for the production of the large variety of ware demanded. Compare these catalogues with those of only a few years back and note the tremendous contrast. Compare the volume of business of the machinery manufacturers of to-day with that of some years back, and the contrast is still more wonderful. This all goes to show the important part that architectural clay work is assuming in the business of the country. Not only is there this wonderful change in shapes and volume of business done, but the demand for variety, in finish and color, has kept pace with it, until the business of working clay for architectural purposes has changed from a slow, sleepy business to one requiring in its management energy and great brain power. The successful clayworker of to-day must be a brainy man, and he cannot afford to rest, but must ever try to keep in advance of or at least up to the numerous and rapid changes that are taking place.

Hollow fire proofing, hollow building blocks and hollow building material generally are with us; and the manufacture of terra cotta has wonderfully increased. A few years ago the manufacture of enameled and glazed brick was in its infancy in this country, and there was some doubt as to its continued existence. To-day this manufacture is carried on successfully by several concerns, and that business is firmly established, and one of the problems of to-day is the production of enameled and glazed terra cotta, for which there is a demand. The demand for this latter material which has arisen in the West has been partially met. A demand will arise in the East, but no efforts are being made to meet it.

The possibilities of steel construction have not yet been exhausted; in fact, have hardly been entered upon. The tendency is toward higher and higher buildings, concentration of business centers demanding this on the one side, and increased cost of construction preventing it on the other. The remedy for this condition of affairs will come from the production of still lighter and lighter building material, and as the demand for this light building material is met a further increase in demand will be made. How fast this demand will increase will depend, as it has in the past, largely upon the clayworker. The architect may sometimes indicate what he would like to have, but it remains for the clayworker to show him by practical work that it can be produced. It is still more the province of the advanced clayworker to anticipate the architect's needs. He thereby creates a market, for there need be no fear that the architects will not adopt a good thing when put before them, though they cannot be expected to specify material which they have no reason for believing they will be able to obtain.

To illustrate my meaning I will point out one of many of my own conclusions and its verification. Enameled brick have for some years been used largely in the light walls of large buildings, and are supported from floor to floor by the steel frame. Their weight is greater than need be. I noticed this fact some years since, and predicted that hollow enameled brick would be demanded, but have not been so situated as to be able to produce them. To-day hollow enameled brick are demanded by the architects, and the manufacturer who successfully produces them will reap his reward.

There is now also a demand for hollow blocks, quite thin and glazed on both sides, for partition walls. This demand some of the Eastern manufacturers are trying to meet, but in a very crude way. This demand should be met in a thoroughly satisfactory manner, as a large amount of business would be secured thereby.

There is a large quantity of ornamental glazed work produced by potters, in the potters' way, at great expense. This work should be taken up by the brickmaker and the goods produced in their practical and economical manner.

The rendering of large buildings fire proof has been one of the great causes which has led to the enormous development of the clayworking industry, but it remains for the inventive clayworker to devise still further use for his material along this line.

The effort in the past has been largely in the line of strict utility. Is it not possible to combine utility with artistic merit? Is it not possible in the future to produce much of the clay work, which to-day is made rough and coated with plaster or cement, in such a way that this coating may not be needed, but that the clay work itself shall be the finish? This will enhance the value of the product per ton, increase the value of the total output, and will undoubtedly lead to larger profits. Enameled brick are possibly due to some such effort; rough brick for strength and tile for finish have been used, and some one a little brighter than common has conceived the idea of producing a material in which strength and finish should be combined. There are hundreds of clays being manufactured into rough products that are capable of receiving a high

degree of finish, and there are many clays being manufactured into unglazed but highly finished products that are capable of being glazed or enameled.

I make these few suggestions simply to show some of the possibilities, but I, of course, realize that many thoughts will occur to you which have not suggested themselves to me. Individual skill and effort have met with their reward in the past, but not to the extent which the future promises. The weight of building material in proportion to its value has heretofore been so great as to largely localize the business. The manufacturer, no matter how bright, how well situated, or how energetic, could not extend his trade beyond a certain district. Within this district he might lead, but outside of it he has been too heavily handicapped by freight. With an era of building material, light in proportion to its value, the field over which the bright, energetic manufacturer will be felt is greatly enlarged. A saving in cost of production or better quality of product are factors whose influence are felt over a much greater area. The manufacturer producing poor material, or material made at too great cost, will be no longer protected in his local trade by freight, and must eventually give up or turn his attention to the heavier classes of goods. Consequently a concentration of capital and the erection of large plants for the manufacture of light goods may be looked for. This will bring with it the employment of the best talent in the country. Such a combination and concentration of capital and talent will lead to results never before thought of.

Gentlemen, we have the best building material there is—strong, durable, beautiful and eminently plastic. It is capable of endless color treatment and of an infinite variety of finish. Before me I see the men who are capable of molding it to their desires, of giving it form and substance, and by fire converting it into material absolutely imperishable. Why, then, should we not largely increase its use? Why should it not supersede the heavy, unmanageable stone? It remains for us to see that it shall do so.

Let us all keep our eyes open and watch the signs of the times, watch building construction and try to anticipate the needs of the architect. We will meet with some failures, make some mistakes, but constant watchfulness will insure many successes, and I repeat, there is not the slightest danger that the architects and general public will not recognize our efforts and appreciate a good thing when presented to them. (Applause.)

CLAY AS A BUILDING MATERIAL—GENERAL DISCUSSION.

President Brush: We are now open for five-minute speeches to discuss this paper, and will be pleased to hear from any one who has anything to say on the subject.

Mr. Gates: Yesterday morning I got into a corner and said to myself, "You know the faults Gates has; he is very much like the parrot who talks too blamed much;" and I made a resolution that I would keep still during this Convention. This is the third time I have been on the floor since yesterday morning. I will try not to do too much talking, and did not intend to get up to talk on this paper. I do not do it now because there is anything to add to the able paper which we have listened to this morning, and I congratulate the Association upon having such a paper read before it. It is a subject, however, which comes so near to my heart, and means so much to all of us, that I am going to run the risk of being sat down upon for again presuming to talk. I told you yesterday that I considered there were a representative lot of men here, employing thousands of men and spending millions of dollars in the conduct of their business, and I say to you that this question comes very near to all of us, and it comes to us in a way that tells us that each one should do more to push our business and see to it that buildings which are erected are constructed of our material, as there are untold effects which we can produce. The architects do not know what you have in your factory, do not know what you are doing, do not know what the characteristics of your products are, until you bring them to their notice. You know the story of the raindrop brick; how an architect was in a brickyard and got a glimpse of a pile of refuse brick, really intended for some hole in the ground, and the rain, dropping on these bricks, produced effects that have been eagerly sought all over the country, and led to the production of the raindrop brick. The little specks in the clay led to the introduction of the speckled brick, which have added so much to ornamental architecture.

These things which have happened when we were not reaching out for them lead me to believe that if this body of men will go to work and reach out for effects in this line and study these things carefully—and I know you are doing it more and more all the while—it is going to produce wonders in architecture. I have studied not only the tints and coloring, but the surface effects of clay have been an attractive study to me.

I tried it as Napoleon did the armor which was bullet-proof. He simply said to put it on the inventor and bring in the soldiers and guns, and they would try it. I tried it on myself, and take pride in living in an all-round terra cotta house, and the beauty of the house is only surpassed by the magnitude of the mortgage upon it.

Mr. Taylor: I thought you were going to say, as you ought to have said, the beauty of the inhabitants—

Mr. Gates: No; that would be a squealer, and I want to talk longer. There are some men who have been doing wonders in pushing the use of our product. I am not in the pay of any of them, and do not get any commissions. But I do not see why I should sit still, and not speak a good word for men who are toiling night and day for our good. Brother Randall, particularly, and Brother Ashby, and Brother Manson; they are doing a great work; they are putting this information into their periodicals and sending them all over the country to people who build houses, and urging them to use our material. I do not know why we should sit still and hesitate to mention their names, because they are doing hard work. They get little encouragement from us, I think, candidly; but their publications go into the architects' offices, and homes and offices of business men all over the country, clamoring for the use of our material. I think it is a duty we owe to ourselves and to them to encourage them in this work to the utmost of our power; not only to encourage them in this work, but to go to work ourselves, and when we see a man, especially a brickmaker, putting up a wooden house, remonstrate with him. You want people to understand the beauties and durability of your material, and you want to work that business up in every conceivable manner so that you will extend the use of this material.

There is no use in my repeating the good points of the material; you are sufficiently well acquainted with them. There is nothing to-day which excels clay as a building material. I do not know why a man who is careful to have his office in a fire-proof structure should everlastingly place his best treasures on earth—his own family—in a combustible building. We want to take these things up and encourage these men in the work in which they are engaged, and push our business in every direction, along every line. (Applause.)

Mr. Fiske, of Boston: This paper has struck the keynote of several things which have been in my mind for a good many years, and in a number of ways, and especially one thing, and that is in regard to the question of building blocks which shall be used in a building, not simply to be plastered over and covered up, but which shall expose their beautiful colors and smooth surfaces, so that no one will desire to cover them up. In Boston, in my own factory, I am not rigged up for making this class of work—the hollow building block. I should have gone into the matter some time ago. It has taken me some time to get round to it, but I have seen enough of the production already turned out by some of the factories further west to know what clay will do, and I have great confidence in it. Is there any reason at all why the dado in this meeting room should not be made of one-colored brick, with or without the panel at the base—a dado of one color, a dark, rich color, and then, say, up to the picture molding, we have another color, and you can make the picture molding of clay as well as of wood. Then the frieze above and the cornice, each part made of different color, so as to give the effect desired in this class of work, but made differently from what the common hollow bricks are made to-day. These bricks must be of good workmanship, which can be done easily—straight, clean, sharp edges, and set in the wall the same as with pressed brick work, and what would be more beautiful than that? Think of the colors in brick to-day! There are beautiful brown, mottled bricks, yellows, grays—what do you want for a wider range of color than we find in clay products? All that is needed is a clean, smooth finish, with good workmanship, and then you have got there. I believe that the time is coming, as our friend says, when there is going to be an enormous business in just that line of work. (Applause.)

Mr. McAvoy, Philadelphia: There is one point which refers to brick not being plastered over. We had a case of that last year. We supplied the brick to a large warehouse in Philadelphia which took two million. The architect specified plainly the ordinary four-inch brick to line the inside, and expected the brick to have a little ridge in the side, like the Jersey hollow brick has, so that the plaster would adhere. We did not care to supply the Jersey brick, and suggested that he should use the ordinary end-cut machine brick. We burned them to a uniform color, and the architect said he would like to try them. It took 400,000 hollow brick to finish the job. After the first story was up he told us to bring it out to the line and not plaster it over. It looks well, and in a storage warehouse it does away with the knocking of the plaster off the wall and the continual repairing of it. We supplied the brick in a nice, uniform red color. Last year we sold one million of the plain hollow brick, with two small holes running through the brick lengthwise. If the brick is not specified we do not make the ridge on it for the plaster.

Mr. Purington, of Chicago: Mr. President, I am glad to know that some of these old fellows have had little qualms of conscience, and that hereafter their names will appear less fre-



THEO. A. RANDALL, Secretary, Indianapolis, Ind.

quently in the records of the proceedings of this Association than in the past. Mr. Gates has realized the true situation, and given us young fellows, the modest men, a chance to say something.

I have no criticism to make on the paper which has been read, but there are one or two points to which I desire to refer. There is one suggestion in Mr. Griffin's paper which I have taken home to myself after attending these Conventions, and at other times, too. He says that very many times much may be said by people who really know very little concerning the subject they are talking about, and who are searchers after truth and accidentally stumble upon it. Some of the best contrivances I have ever used in brickmaking have been obtained from men who really knew very little about it, and in visiting small yards an idea would fix itself in my mind, which I would afterwards try to develop; and I want to call your attention to this: that it is not always the old stagers and men with the long

experience from whom you are going to get your information, but it is frequently from men of brains who have just come upon the scene of action—men like Gates, Adams and Taylor. (Laughter.)

CLAY FIRE-PROOFING.

There is one other point which, it seems to me, at some stage of these Conventions, should be discussed, and that is the question of fire-proofing. So far as I know there is not to-day anything in use under the term "fire-proof" that can be so called truthfully; in other words, there is not any material that I have ever seen heated to the heat frequently produced in great fires in large buildings, but which, when a stream of cold water is poured on it, becomes absolutely useless and goes to pieces. I know that that has been the experience of a scientific man in Chicago, who has given attention to the subject with the hope of discovering some material which is absolutely fire-proof, and he has shown me specimens of vitrified clay that was used even for fire-proofing, that had been subjected to that test, and it was a failure in each case. If any one knows of a material that will stand heating to a high temperature, and then on suddenly turning a stream of cold water on it from a hose it will retain its shape and its quality, that is the material I am looking for.

I want to say to Brother McAvoy—it is sometimes the case that the older sections of our country are a little bit slow-going—if he has just commenced to make hollow brick, that in the West they have been a staple for years; we could not get along without them.

Mr. Gates, Chicago: Mr. Purington has been interviewing somebody who has been conducting a series of experiments on the question of fire-proofing, and it is not fair to put down his conclusions as a general principle. Every one of us knows the entire difference there is between clays, not only between different clays, but in the same clay, submitted to different temperatures of burning, as to its ability to resist heat and water. Some clays are burned to a high heat, almost vitrification, and it is possible that the clays are formed into thin tiles, with nothing hardly to sustain them, and, with sudden intense heat and cold water thrown on them, they will break. It does not follow that the same clay, treated a little differently in its construction, given enough support to hold it in place, and given a fair chance, will do the same. It does not follow that because one piece, when it did not have a fair chance, gave way under trial, the clay must be condemned as to its qualities as a fire-proofing material. Do not let us get down on the record as criticising our own material. I know that there have been a series of experiments made that way, but I tell you that the question of construction is a vital question to us, and because an architect in his office, or an architect's draughtsman, who has never been in our factories and does not know the peculiarities of our material, goes to work and tests a beam over there or a lintel over here with a thin shell of clay that has been burned perhaps to a very high degree of hardness, and subjects it to an intense heat, and cold water is thrown on it, perhaps thrown with force enough to break off the thin clay in the way it is constructed, and, because it fails under this test, clay is to be condemned as a fire-proof material. What is there that has the same advantages that clay has as a material formed in intense heat? There are lots of clays of which you can take a piece from the kiln and throw it in a pail of cold water and you cannot find a crack on it.

Mr. Purington, Chicago: Perhaps I made a too radical statement. I do not claim that clay materials are not fire-proof, and I do not want that lost sight of. They are. A room incased with tiled floor and hollow brick wainscoting and walls, as has been described, would be absolutely fire-proof, because there would be nothing else to burn; but we must provide for the time when the room is filled with combustible material and the material set on fire. The clay walls will become heated to a high degree of heat, and then cold water is thrown on the

walls, and the trouble begins. If Mr. Gates has a material with which he can incase rooms which will withstand this treatment, that is what we are after. I made the statement strong for the purpose of touching up Mr. Gates and some of the other members.

Mr. Taylor: We have struck one of the most important questions of the hour—the use of clay for fire-proofing—and as we are here for the purpose of getting instruction, I think I will drop a thought that may help some brother brickmaker who is considering this subject. The question of fire-proofing, whether the interior or exterior of buildings, is, as has already been stated, very important; but the question which Mr. Purington brought up of the destruction of so-called fire-proofing by its becoming heated and then suddenly cooled with a stream of water contains in it a very serious question and an element of danger to the reputation of clay as a fire-proofing material, and it arises from a mistaken idea that any clay is suitable for fire-proofing purposes.

As you know, I never want to step on anybody's toes, and I do not want to do so to-day. I make this assertion, and am sure I am right—though I may be thought wrong—fire-proofing for hollow brick purposes should be made of low grade fire clay. I do not care how hard that is burned, if slightly porous, but it is certainly a mistake to take a red clay that will vitrify at a low heat and make it into hollow blocks and call it fire-proofing material. There is plenty of clay to-day which is made up into hollow bricks for fire-proofing purposes that, the moment it becomes hot on one side and receives a stream of cool water on the other side, will pop as readily as a glass bottle, simply because the clay has been turned into a condition almost that of glass. I think it is a mistake to use red, vitreous clays for making fire-proofing material.

Mr. Fiske, Boston: I want to say this: I would like to go on record as saying that I would stake my reputation as a clay-worker on this: that fire-proofing made of a medium grade of fire clay, not too low a grade, made porous and well burned, will stand any test of heating and cooling to which you can put it. (Applause.)

Mr. Merrick, Syracuse: There is an architect in our city who once was a brickmaker who has claimed that a common hollow brick will stand a greater pressure than a common solid brick. I have had occasion myself to supply, under the direction of one of our architects, brick for a large building covering a block, in which they desired to have a light construction, and, with the exception of the outside course, the building was laid with the small hollow brick, and it stands as one of the best office buildings in our town. It is of common hollow brick, except the outside course, and it is considered to-day by the people as one of the best office buildings we have. Although not a thoroughly fire-proof building, yet with this light hollow brick construction we consider it a fire-proof building for such a class of construction.

President Brush: If this matter has been settled satisfactorily to our Chicago friends we will proceed to the next order on the programme, the paper on "Difficult Problems in Brick-making," by George C. Hicks, of Boston.

Mr. Hicks then read his paper, as follows:

DIFFICULT PROBLEMS IN BRICKMAKING.

The general impression about the brick business appears to be that it is profitable and simple, and involving few difficulties of manufacture. As a consequence, men do not hesitate to embark in new ventures in this direction who would refuse to engage in others without previous knowledge and expert experience. It seems captivating to capitalists. A large share, and the worst, of the vicious competition encountered in our business results from new concerns, who turn out poor goods and force them on the market. However, millionaires are scarce among us, and some of us are even now students of economy. Such associations as ours should correct this impression. There is no branch of business that presents greater difficulties. It has no fixed rules, but is a constant readaptation and readjustment of methods, and it is full of obscure results. The problems begin with the clay bank and seem to have no ending. The strata of sedimentary clays vary greatly in extent and composition, and even the most careful watching will not entirely prevent partial mixture of these strata in digging. Clays very aluminous and plastic in one part of the

bed will so gradually change without change of appearance, with increasing proportions of silica, that cracked goods will give the first alarm and lead to changes in treatment. There are no other raw materials of such wide differences in component parts, in the amount of combined water, in the degree in which they approach chemical compounds, and in the amount and character of their impurities. Fire clays vary so much in the same bed that continued tests must be made to secure standard products. In their manufacture the requirements grow more exacting as the operations of metallurgy advance in the use of higher heats, united with chemical and electrical action.

Consider for a moment the requisite for gas retorts. Every four hours, night and day, for at least eighteen months, they must, when at the whitest heat, stand the shock of charges of even four hundred pounds of coal, often wet and ley. They must endure the wear of the coke and the iron utensils, and be close grained and gas tight. There are other products whose requirements are still more exacting. Metallurgists are smelting new metals and alloys, and with each new process comes the problem of resistance to more furious blasts of that universal solvent, heat. The makers of building bricks and terra cotta must use equal vigilance and have as deep penetration into the hidden characteristics of clays.

HOW TO PREVENT CRACKING IN CLAY WARE.

One of our most difficult problems is this: How can we combine these clays into hard and dense bodies free from cracks? First, the mixtures must be thoroughly homogeneous, with little entrained or entangled air, and they must be uniform from day to day, summer and winter, so that once the best treatment is secured it shall be followed by uniform results. The most certain method of mixing seems to be the grinding of the clays together in a wet pan before they are mixed with grit or sand and until they become a paste of leathery consistence. Much air is thus driven out and all the tougher particles are broken down. If the clay is too dry water can be added; if too wet drier clay mixed in. Thus is the clay made into a better mixture than it can be after the grit is mixed in. In the clay bank it is wet or dry, with the weather. In the clay pile, if under cover, it is getting constantly drier. In using this method its condition is noted, and uniformity may be readily secured. Every sedimentary clay is a mixture of both softer and tougher particles. These must be mashed together in a moist state. Soak pits do not accomplish this. They make the soft particles much softer, the tough particles a little softer. Pulverizing reduces the size of the particles, but does not mash them together and entangles much air, which tends to keep the particles apart. All powdering works against density and tensile strength; all mashing and condensing promotes them. It is not enough to pass the clays once between two rolls. The moisture cannot thus be controlled nor the particles uniformly united. The pan should be in the line of progressive movement, and as nearly automatic as possible in discharging. The slight extra cost is more than made up in ease of pugging the mixture to perfect uniformity. The next step is adding the grit or sand. The plastic clay is the binding force of the brick; it must have sufficient density and toughness to pull itself together in shrinking when it dries and when it is burnt in the kiln. Too much grit or sand reduces the tensile strength, and the bricks crack because they cannot shrink together, especially under the weight of the bricks resting on them. From 20 to 30 per cent. of grit or sand is about the range of proportions, with 80 down to 70 per cent. of clay.

THE PROBLEM OF COLORS.

The beauty of the buildings of the Columbian Exposition greatly increased the demand for better architecture and more delicate colors. The dull and greasy looking shades are giving way to those brighter, purer and more refined. We can hardly do more than notice this problem in passing; but it is perhaps the most difficult of all, and often puts the manager to his "wits end." Natural colors are the most reliable and permanent, those that result from the combinations of the clays, rather than those that are obtained by mixing in metallic oxides. There are few brilliant colors that are not brought out by extreme heats in the open fire, except those that are too costly for ordinary building bricks, and such as are used in encaustic tiles. When the manufacturer confines himself to the natural colors of the clays in his vicinity his task is easy compared with that of those who use a wide range of shades and gather the clays from widely scattered deposits.

HOW TO MAKE VERY LARGE PIECES OF CLAY WARE.

Skill in manipulation is a prime factor here. The only limit to the size of pieces of clay ware is the possibility of handling and burning them. They can be successfully made weighing two tons. This is accomplished by great reduction in shrinkage, using large proportions of hard angular grit, bound by tough clays containing the least combined water. They must be worked in a moist state to a perfect paste, excluding the air. All the fine and impalpable particles of grit must be screened out. About 60 per cent. of grit is mixed most thoroughly with about 40 per cent. of very stiff clay. This mixture must be hammered into the molds, taking special care to roughen the surfaces when adding new material. Wooden molds should be used, coated with flour paste mixed with fine grit, so that the clay separates from the wood. For ornaments plaster lining to the wood is used. The pieces must be handled before they are so dry as to be brittle. There is little danger of cracking. They must rest so that they can shrink downwards, both in drying and burning. They must be burned in down-draft kilns. Terra cotta columns have already been made over twelve feet high in one

piece, and gas retorts weighing over 3,300 pounds are in daily use. It is one of the surest results in clay manufacture. The greatest diversity of problems is in the burning.

The proper proportions and dimensions of kilns, their construction for greatest durability, the arrangement and location of their outlets, their facilities for rapid cooling, the setting of dissimilar wares in the same kiln, are all questions to solve that will not stay solved, as they are complicated by the permutations of clays and processes, and require, instead of the usual rule of the thumb, the most intelligent study and experience. Even the manufacture of metals does not offer equal opportunity for advanced thought and original research.

The last problem is, how to burn a high down-draft kiln uniformly from top to bottom.

Firstly, it must be set uniformly with vertical and horizontal flues, connecting throughout the kiln, of nearly uniform dimensions. In the next place the goods must be thoroughly dry. The furnaces should have their grates at a level of about sixteen inches above the kiln floor. The outlets to the stock should all be in the center of the bottom between the furnaces. These outlets should consist of openings, running lengthwise about two and a half inches wide between four-inch tiles, which bridge over the center lower flue. The bottom bricks should be set five courses high, on the flat, with flues between them running two and a half inches wide from the furnaces to the riddles or openings. The bags, or bridge walls, should be made with side walls, separating the fire holes, or combustion chambers. The bags should be open-work setting, headers and stretchers, so that the fire can pass through into the kiln. Up to about twelve inches above the grates



JNO. W. SIBLEY, Treasurer, Birmingham, Ala.

must run the solid furnace wall, and on the top of this there must be three openings about six inches wide and nine inches high for each furnace, opening directly into the kiln. The bridge walls, or bags, should not run more than four feet above the furnace.

In starting the kiln each of the large lower openings should be nearly closed up by loose bricks, which can be hooked out at the proper time. The kiln should be started with the furnace doors open, and kept so for twelve hours. The heated gases will not at first pass through the openings in the bridge walls, because these gases are so much lighter than those in the body of the kiln; but after big fire is started and the top gets incandescent the gases will begin to pass through, and increase in volume as the heat gets lower down. After thirty-six hours' firing at high heat and the kiln is incandescent to the bottom, the loose bricks should be pulled out from the openings, and the hottest gases will flow freely through the lower part of the kiln and perfect the burning. A moderate experience with this method will accomplish good results, and good judgment should insure uniform success.

The burning of clays demands better equipped men. There are new results to be obtained and materials to be made for new uses; colors more brilliant, bodies of greater density, dimensions and strength; materials to replace metals; to be combined with metals.

The present is but the foundation for the future in our business as well as in others. Let us start anew on this foundation and build up our business to the highest elevation of which it is capable. (Applause.)

President Brush: Before we adjourn we have just ten minutes for the discussion of this paper. Before doing so I want to announce that we have made arrangements for a delightful ride about the city. I will also take this opportunity of announcing the

COMMITTEE ON RESOLUTIONS.

Messrs. D. V. Purington, Chicago, Chairman; William McCay, Philadelphia; W. H. Hoagland, Detroit; W. S. Bowen, Tacoma, and W. G. Titcomb, of Boston.

Mr. D. V. Purington: I do not like to interfere with the arrangements of our Buffalo brethren, but they have misconceived the object of our coming to Buffalo. I do not want to adjourn at 11 o'clock. We did nothing yesterday, and we have only had an hour's session this morning, and I submit that it is the deliberate judgment of a large number of our members that if we can possibly do it without showing disrespect to our Buffalo brethren we omit this ride.

Secretary Randall: Mr. President, in all fairness, I am heartily in accord with the sentiment expressed by Mr. Purington that our sessions should be relieved of intrusion of this character. However, the Buffalo brethren have made the arrangements and ordered the vehicles, which are to be headed by those containing the ladies, so it would be pretty nearly discourteous if we should decline to accept this invitation. I would like to avoid the excursion in the interests of our business sessions, but the arrangements have been made. If we cut the ride a little short and get here promptly at 2:30 we can probably finish the day's programme in good time.

President Brush: We want to do all our business and have a little fun with it. (Applause.)

Mr. Eggers: The vehicles are here and waiting for us, and it would be discourteous if we should send them away empty. I am willing to stay here this evening, if necessary, and finish the rest of the work for to-day. I am also in favor of taking the sleigh ride while the sleighs are here.

Secretary Randall: Mr. Carter, Chairman of the Entertainment Committee, requested me to see that you were all in the sleighs when those containing the ladies should come along, and they are now about due.

President Brush: When you are in Buffalo you have to do as the Buffalonians do. This meeting is adjourned.

SEEING BUFFALO ON RUNNERS.

The members quickly donned their heavy coats, and, entering comfortable sleighs, a half hundred of which were lined along the street, were driven about the city. The jingle of sleigh bells gave a merry air to the procession, which was three blocks or more in length. The drive lasted a couple of hours, and gave the visitors a much better idea of the size and beauty of the city than they could have otherwise obtained. The ride was thoroughly enjoyed by all, particularly by those from the South, to whom a sleigh ride is a rare treat.

THIRD SESSION.

Wednesday Afternoon, Feb. 3.

President Brush called the meeting to order at 2:45 o'clock, and, in his hearty manner, said: Gentlemen, I apologize for interfering with your programme to-day and participating with you in a little sightseeing and sleigh riding. I hope you will forgive me. I never will do it again. (Laughter.)

Mr. D. V. Purington: I want to say that I am eating humble pie, and I never saw a better illustration of the old adage that "all work and no play makes Jack a dull boy" than we had this forenoon. I am sorry I said anything about it, for the sleigh ride was a delightful bit of recreation, and I, for one, feel like tendering a vote of thanks to those who engineered the affair so successfully. (Applause.)

Secretary Randall: Taking up the programme where we left off this morning, the next business would be the paper on "Burning Brick," by Mr. H. L. Boas, Reading, Pa. I have a

letter of regret from Mr. Boas, in which he says: "For the past few weeks I have not been in the best of health, but still expected to be able to attend the Convention, but at the last moment find it impossible to do so. I regret exceedingly my inability to participate in what will no doubt be an interesting and instructive session, and wish you and the entire membership success and a jolly good time, and hope to be with you at the next annual meeting." As that leaves a blank on the afternoon programme, I suggest, if it is the pleasure of the gentlemen present, that we skip over to the programme of tomorrow and have a paper read by Mr. F. H. S. Morrison on "The Requirements of the Trade from a Practical Standpoint." Mr. Morrison is present, and says it is likely he may be compelled to go home to-night, and he would rather read his paper than trust it in the hands of the Secretary. Mr. Morrison is one of the best known brick dealers of New York city. On the programme his residence is given as Richmond, Va. This is an error. Mr. Morrison is the New York representative of the Powhatan Brick Company, of Richmond, Va. I think, if it is the wish of the gentlemen present, it would be well to hear Mr. Morrison at this time.

Mr. Mecusker: I move that Mr. Morrison be requested to read the paper.

Carried.

REQUIREMENTS OF THE TRADE FROM A PRACTICAL STANDPOINT.

To the President and Members of the National Brick Manufacturers' Association of the United States:

Gentlemen—The two great problems confronting you to-day, in comparison with which all others sink into insignificance, are as follows:

First—The production of goods of satisfactory quality in paying quantities.

Second—Marketing your output at a reasonable profit.

Without solving these questions successfully, your business cannot be maintained satisfactorily and your ultimate downfall, while it may be slow in coming, is as sure to materialize as the sun is to rise over our heads to-morrow morning. You may struggle on for a time, either laboring under a delusion, or hoping and praying for a change for the better, but unless the two great problems cited are solved the progress of the wheels of time will surely mark your ultimate ruin.

The proper place to judge of the prosperity of a brick factory is not in the storage sheds, where an attractive display makes glad the eye of the enthusiast; nor yet the press rooms, where the hum of revolving wheels and the noise of the busy "plunger" sounds sweet music to the ear of the initiated. It is not to gaze at the beautiful front of a series of majestic "sky scrapers," where the product has been used to the eminent satisfaction of architect, owner and contractor; but visit the sanctum of the bookkeeper and examine that insignificant pamphlet, the mission of which is to show the bank balance. This done, and the tale will be told in no mistakable terms.

Yes, gentlemen, as I once heard a prominent New York business man remark at a meeting of the Board of Directors of a corporation which showed large possibilities on paper and a very small bank balance, "D—n your figures! The bank account tells the tale."

It is my province in business to work out for those whom I represent the problem of marketing that which they are engaged in producing. This being the case, I shall confine my remarks to the second proposition advanced at the outset, and I sincerely hope that the few practical points, which have from time to time occurred to me, and which I shall now give you, may prove of value to those present, or some of you, at least.

There is no department of the brick business which is so sadly neglected or so poorly managed as the sales department of many of our factories. I could cite instances where the volume of business done is of such proportion as to warrant the capitalist, who is furnishing the "sinews of war," in expecting handsome returns, yet when the books are balanced, the balance is invariably on the wrong side, and this notwithstanding the fact that the prices obtained are such that the profits should be large.

Why this state of affairs? It is not because of mismanagement on the part of the manufacturer, but because profits, which should be his, have gone to swell the bank account of unscrupulous and grasping agents, and so from year to year the manufacturer plods along, hoping against hope for a better day, sending good money after bad, his nose at the grindstone, his bank account dwindling, while the leech that is drawing his life blood gloats over the wreck that he is slowly, but surely, producing, and casts around for another victim upon which to feast so soon as the vitality of the first is gone.

Now, gentlemen, I do not mean to convey the idea that all agents engaged in selling bricks are of the class I have just described, for there are men thus employed who are of the highest integrity and who are worthy of the fullest confidence and respect of any business man; but I am sorry to be forced to admit that this class

is in a painfully small minority, and yet, in almost every instance, those who should be classed in the former category prosper and for a while enjoy the fullest confidence of the manufacturer and an overtrusting public. That this is a fact I know. That the manufacturers of the United States are in many instances being victimized I also know, and if they will but open their eyes and apply the same business astuteness to their dealings with those who sell their product which they apply to the conduct of affairs at their factories the greatest evil known to the craft can be overcome and wiped out of existence.

There are too many men in the brick business who pose as commission men, without a dollar at stake, without a cent's credit, but who are in reality operating as dealers, making a dealer's profit, hoodwinking the manufacturers and thereby getting credit, which many well-rated men could not get from a safe, conservative business house in any branch of trade. There are but two channels through which the manufacturer can reach the trade and at the same time make use of a middleman. First, by selling direct to a dealer; second, by selling through commission men. There is only one drawback in pursuing the former course, viz.: that inasmuch as the dealer puts up his money and assumes all the responsibility, he naturally operates on a basis whereby, when the goods are sold, he receives a dealer's profit. This means one of two things. Either the manufacturer will get less for his goods or the trade will pay more for them, both of which operate to a greater or less degree against the manufacturer, one affecting the profit, the other the volume of business. The complications arising from this method are not great, owing to the fact that the manufacturer is perfectly safe, provided he protects himself by making use of the methods generally applicable to the establishment of a line of credits. If, however, the manufacturer adopts the second method and sells through commission men, there are many points which must be carefully observed and steps taken to protect himself, or he will become insolvent before he knows it.

In contracting with a commission man, the manufacturer must so draft his contracts as to provide for the business being done in his (the manufacturer's) name, and must insist that there be no deviation from this rule. Never make an agreement with a commission man by which you are to receive a fixed price for your goods f. o. b. cars at the works, net to you, for by so doing you are throwing the door wide open. There should be in all cases a clear and distinct understanding that the agent is to receive a commission only, and that the manufacturer is to be given full and explicit information covering every transaction. The moment you vary from this course you lay the foundation for what may prove your ultimate ruin. Let all payments on contracts be made to you direct, and remit your agent's commission, unless you are dealing with men of a financial standing which fully warrants you in deviating from this course. By doing this you are casting no reflection on the agent, but simply exercising that prudence which business demands that you should exercise in order to fully protect yourself.

If you are selling goods delivered at the job, where you contract and pay for the trucking, make your contract with the truckman direct and pay the bills for trucking yourself, simply having them "O. K.'d" by your agent. In no instance make an allowance of a stipulated amount to the agent to cover trucking. When an allowance for broken or damaged goods is made have the claim come direct from the purchaser and let it be simply "O. K.'d" by your agent.

The above rule, if carefully observed, will throw around the manufacturer that protection which it is absolutely necessary that he should have, and without which he will never know just where he stands. You may ask why I am so exacting in my requirements. I answer you as follows: I could cite instances where goods which brought the manufacturer less than \$12 per M f. o. b. cars at the works were sold (on a commission basis (?)) so as to bring the agent a clear profit of over \$13 per M. Again, I know of a case where agents are handling goods (on a commission basis) which range in price from \$20 to \$30 delivered at the job, and make an open boast that they make a uniform profit of from \$5 to \$10 on every thousand brick sold. In both of these cases the manufacturer advances the freight and cartage, to say nothing of running all the risk. I could give you instances where parties posing as commission men and dealers are using the money collected for the manufacturer for whom they sell on commission to pay cash for goods which they buy as dealers and upon which the manufacturer from whom the goods are bought will not allow them credit. I could show you how agents, claiming that they had special rates on trucking and under the guise of befriending the manufacturer by having his goods hauled and paying for it themselves, put from fifty cents to a dollar per thousand into their own pockets by the operation. I could give instances where claims made by agents for broken or damaged brick have been allowed by the manufacturer when no broken or damaged brick existed, but the brick were resold and the money put into the agent's pocket. So I could go on, citing scheme after scheme, plan after plan, in every one of which the manufacturer is the loser, until it would make your hearts sick.

Can any business susceptible of such methods as these prosper? I have not overdrawn my picture of what you are contending against. I have simply cited instances which have come under my personal observation since I have been connected with the brick business, and I give it to you that you may be alive to the dangers surrounding you. It may shock you to hear me say so, but I know that I am not exaggerating when I say that more than 50 per cent. of the face-brick manufacturers of this country are to-day suffering to a greater or less degree from the causes I have enumerated. There was a time when I would (as many of you doubtless will to-day) have laughed to scorn such a statement as this, but the day will come when you will be forced to acknowledge that I am right.

What the brick manufacturers of this country need most are more selling agents who are in a position and who have the inclination to build up slowly a safe, conservative business for those whom they represent, as well as for themselves, allowing the manufacturer a reasonable profit, giving the trade a reasonable price and making for themselves a reasonable commission. When you cast your lot with a selling agent be sure you are entrusting the handling of your goods to a man who has the confidence and respect of the men with whom you expect to do business. Do this, follow the lines that I have laid down in drafting your agency contract, and your bank account will tell a more satisfactory tale. Let the present methods prevail and you will hear more such trade stories as "A (the manufacturer) lost \$100,000 last year and B (commission agent) made \$10,000 for showing him how to do it."

The requirements of the trade from a practical standpoint are honest goods at market prices. This means a fair and equitable profit to the manufacturer, provided he throws those safeguards around his business which will give him the benefit of the price paid, after deducting legitimate expenses. There are many other difficulties which bestrew the path of the manufacturer in this particular connection which I might take up, but upon writing to your worthy Secretary, asking him how much time I would be allowed in this Convention, I received a very courteous letter from him stating that, while I would not be limited, he thought about fifteen minutes would be the proper thing. Therefore, I have simply taken up the commission business from its worst aspect, and hope that what I have said may sink down into your hearts. If you are contending with the evils I have cited, take steps to protect yourselves; but do not think, because you do not know that



O. J. SWEGLES, Buffalo, N. Y.

such evils exist in connection with your business, that they may not exist. It is your duty to find out for yourselves whether or not they do exist. The rest is plain sailing. Forewarned is forearmed. (Applause.)

MARKETING PRESS BRICK—GENERAL DISCUSSION.

President Brush: I would like to have this paper discussed by some of our members who are in the habit of selling brick on commission. Mr. Kimbell, of Chicago, I believe, is in the room, and we would like to hear from him on the subject.

Mr. Kimbell: Mr. President and Gentlemen—There are many points in the paper which are undoubtedly correct, but I do not happen to pick up such agents as the paper describes, and the concerns which represent us are as careful in picking out agencies as they are in selling bricks to customers. We look up the agent's record as well as the customer's. If you appoint agents haphazard you are liable to get caught. A good, safe system of selecting business agents and making them give the proper returns has always been very satisfactory,

in our case at least. We never had any agents who got away with anything we could not make them account for. The idea that the gentleman speaks of in the paper of giving a price f. o. b. at the works is good. If it was done at all times I would be willing to accept that as a rule to go by. Let the commission men pay for the bricks on the car at the works, pay their own freight and hauling, and do away with any question of dishonesty or poor material, because a man will not load poor material in a car and have the freight charged back to him again by reason of the brick being rejected. I think the criticisms are all right in some cases, but if I had my way I would do away with agents entirely and sell the complete output on cars at the works, and that would do away with the difficulty.

Captain Crafts: We have an agent who sells our goods, and we are a part of him, and we make returns every fifteen days. If there are any lame ducks they report it, and no man can get bricks until he has paid up his account, if he fakes them from one or another of us, and we do not have any trouble in that respect, and I guess if our losses from bad debts were the only troubles we had we would survive a good while.

President Brush: If it is the pleasure of the meeting, we will take the next business in order on the programme. The Secretary will please announce it.

Secretary Randall: This brings us back to the forenoon programme proper, omitting Mr. Boas's paper, which did not materialize, and in place of which we had the paper by Mr. F. H. S. Morrison. It brings us to what we had meant to term a debate upon the subject, "Which Principle Is Better for Burning Brick—Up-Draft or Down-Draft?" The word "common" is in the question as printed, but we might properly, perhaps, omit it for the sake of discussion. Mr. R. B. Morrison will represent the affirmative and Mr. W. S. Purington the negative—that is, Mr. Morrison will speak in favor of the up-draft and Mr. Purington in favor of the down-draft, each gentleman to have ten minutes to state his views, to be followed by a general debate.

Mr. Morrison: I must object to that change seriously. I cannot admit of that change in the programme at all. That interferes entirely with my discussion. The question as originally stated was, Which principle is better for burning "common" brick? I cannot accept that change so far as my argument goes. If you see fit to allow Mr. Purington that latitude I cannot object to that, but I shall confine myself to the question as given to me. I will discuss the question as it is found in the programme.

WHICH PRINCIPLE IS BETTER FOR BURNING COMMON BRICK—UP-DRAFT OR DOWN-DRAFT?

—Debate by R. B. Morrison and W. S. Purington.—

By Mr. Morrison: In the consideration of this question I will discuss practical results and advantages, rather than the relative merits of the up or down-draft principle. The first thing to consider in reference to the construction of any kind of kiln is the cost of building. There are many kinds of up-draft kilns; some consist simply in permanent walls, with fire holes opposite the eyes of the kiln, with or without sub-arches. This is the cheapest up-draft with permanent walls. Then there are kilns with similar walls, with generating furnaces and combustion chambers between furnace and fire passages, the Wingard kiln being the prototype of this class. These are the most expensive up-draft kilns, and will be used in comparison with down-draft in considering the relative cost of the two kinds of kilns under discussion. In giving figures I only estimate the cost of each to show the difference. These figures may not be exact, but they are near enough for the purposes intended.

Good up-draft kilns cost for each 100,000 brick capacity from \$600 to \$800. Good down-draft kilns cost for each 100,000 brick capacity from \$1,600 to \$1,800. A brick clamp or kiln is necessarily short lived; therefore, the greater amount invested in its construction the longer time in getting your money back. This item is worth consideration. The next question to consider is cost for fuel and labor of burning bricks. On this point there may be a difference of opinion. So far as my experience goes, I have found that it costs more to burn bricks in down-draft kilns than in up-draft. I have also made inquiries of those having large experience with both kinds of kilns, and their statements confirm my opinions as expressed. In the discussion of this subject you will bear in mind that we are only considering the burning of common bricks. The handling of these brick into and out of the kiln is an item of expense that counts, where the margin of profit is in many cases "out of sight." That it is more convenient and cheaper to kiln and ship brick from up-draft kilns I believe

will be conceded without argument. This brings us to a consideration of quality of the brick burned by the two methods, which, I have no doubt, my able and distinguished opponent will use for all it is worth to vanquish me. At this point I will assume the defensive. I presume Brother Purington will tell you that in an up-draft kilns there is from 10 to 25 per cent. soft brick and half the balance damaged arch brick; while in a down-draft you can burn all the brick hard and but few overburned. While this may be true in many instances, it will not prove the general rule. It requires a higher degree of skill to burn successfully in down-draft kilns, for he must act rather through faith and unerring judgment than by sight; but the burner in an up-draft kiln can at all times see the heat and its effect, both at top and bottom, hence there is more risk of mistakes being made in burning a down-draft kiln. I have seen down-draft kilns of common brick that were practically all hard and very few overburned; but in most cases there are some melted brick around the bag walls, and also from three to six courses of pale brick from the bottom. In up-draft kilns of the class I am discussing the arch brick are usually all good and 85 to 95 per cent. hard brick, and I have seen whole kilns unloaded with less than one hundred bricks lost in one hundred thousand. This is what can be done with proper management. I do not claim that all the advantage and saving is with the up-draft kilns. I know down-drafts have their special merits, but I would be lacking in courtesy to my Brother Purington were I to steal his thunder and tramp down the grass in his field of argument. For burning fire bricks exclusively, or vitrified pavers, or terra cotta, the down-draft kilns have many distinctive advantages and savings over the other system, but I shall insist on confining this discussion strictly to the subject, which is common brick. For convenience of handling into and out of a kiln, saving in fuel and labor, the great difference in amount of capital invested in the plant of kilns, it seems plain to me that for common brick up-draft kilns are decidedly the best. In reference to the salmon brick in up-draft kilns for building purposes, this proportion of salmon brick can be marketed without any trouble, and in many instances where salmon bricks are used for inside work, a kiln with 10 per cent. salmon will be worth as much to the manufacturer practically as would the kiln be if all the bricks were burned hard. I will say before closing that there has been as high as 98 per cent. hard brick burned in up-draft kilns, and the color from top to bottom as uniform as it is possible to burn brick in the best down-draft kilns. The greatest drawback to-day in the manufacture of common brick is that the capital invested is too large. Margins of profit are so close that cost of construction and plant must be kept to the lowest point possible to enable the capital invested to earn a dividend that is satisfactory to the stockholders.

President Brush: Mr. W. S. Purington will now answer the other side of the question.

Mr. Purington: Mr. Morrison has had some twenty-five years' experience in the burning of common brick in up-draft kilns. I have never put a common brick in a down-draft kiln in my life, and do not know what the result would be. The Secretary suggested leaving out the word "common," and that the debate should be on the burning of brick for paving and pressed brick. You can see that it leaves me in no condition whatever to talk, as I have had no experience on that line, and there are many gentlemen here who have had a good deal of experience in that line and are quite ready to take up the debate. I think Mr. Morrison makes a mistake when he says that the control of an up-draft kiln is under better command than a down-draft. I cannot see on what he bases that idea, from the fact that a man, to see his heat, watches the furnace, looks through his peep holes, whether it be an up or down-draft. As to the results in the top, he gets a little there after the fire gets up, but in the center and bottom he gets the results in a kiln with a crown as well as one without a crown. I am of Mr. Morrison's opinion in regard to burning common brick, as far as I know, and to have a debate on this subject there must be two sides.

President Brush: According to this debate, so far, Mr. Morrison seems to have outwinded Mr. Purington, who pleads that he has not followed that business—

Mr. W. S. Purington: If the question had been changed as suggested I could have talked upon the subject without end.

President Brush: I think the gentlemen are both a little off the track on the subject. They are speaking now of the respective merits of the kilns, and the question is, "Which Principle Is Better?" There ought to be a good many gentlemen here who can discuss this question.

Mr. Farnham: I would like to suggest this: Would it not convey some intelligent idea to the Convention if the question was put in a shape to contrast the up-draft kiln for common brick with the horizontal or ring-type kiln for burning common brick?

Secretary Randall: There is a slight difficulty, perhaps, in the way of debating this matter of the up and down-draft kiln for burning common brick, for the reason that common brick are burned only in up-draft kilns, unless we consider the continuous kilns, in which, as a rule, common brick alone are burned, as representing the down-draft principle. I suggest that Mr. Cnsh Brush, of Buffalo, give us his ideas on the question.

Mr. S. C. Brush: I hope the gentlemen will excuse me. There are many gentlemen here who can give you information on the question. We are using the continuous kiln, and consider it very good for common brick. It is much cheaper than down-draft or up-draft kiln, and we have a larger percentage of hard brick in a continuous than we do in the up-draft kiln. In the down-draft kiln we burn a few common brick, and have better results than with any kiln other than the continuous kiln, although it costs more to burn them. It costs fully as much to burn our common brick in our down-drafts as it does in our up-drafts, even a little more. Our down-drafts run to the same stack that our continuous kiln does. The partition in our chimney is not right as we have it, but the kilns are running and we cannot change it now. When we start a down-draft kiln with the watersmoke it interferes with the continuous, and in the same way the continuous interferes with the down-draft.

Captain Crafts: Can you burn a good common face brick in your continuous kiln?

Mr. Cnsh Brush: Yes, sir; of course, there are more or less ashes on the brick, but they will brush off. I would not burn pressed brick in a continuous kiln.

Mr. Morrison: It may seem that that word "common" is not of much account. I want to call your attention to the fact that about 95 per cent. of the brickmakers of the United States are engaged in manufacturing common brick. The common brick manufacturers are in a great majority, and we want to discuss a question once in awhile which interests them. I was very much pleased to see this question on your programme, because I knew that a large majority of the brickmakers were interested in that question, and I see no reason for taking another course and bringing in down-draft and continuous kilns. I protest against it, and trust the question will be confined, as stated in the programme, to the burning of common bricks. I desire to have you understand how I feel about this question. I insist that the remarks be confined to the burning of common bricks, whether by up-draft or down-draft. Mr. President, I make the point of order, and ask you to rule upon it.

President Brush: Mr. Morrison's point is well taken. (Applause.) We are going to carry out this programme, no matter who it hits. (Applause and laughter.)

Mr. W. S. Purington: Mr. Morrison's point is well taken on this particular topic. I agree with you and him that the question to be discussed is the burning of common brick. We are burning both ways, and it is a grave question in my mind whether it would not be economical in a yard situated where there is an abundance of coal, and where you would be liable to stay for twenty or thirty years, to put a down-draft kiln in from the start. This is simply a suggestion. I am not clear in my mind about this, but think I know as much about it as Mr. Morrison does.

Mr. Batley: The question before this Convention, if I can read this paper (holding up programme), is, Which principle is better for the burning of common brick? There is nothing in this paper which defines a continuous draft kiln. I say, as an experienced brickmaker, that a continuous kiln is a down-draft kiln, and I do not believe that this Convention can show me that the continuous kiln is not a down-draft kiln. The ruling which Mr. Morrison desires to have passed is not correct, and should not be so considered by the Chair.

Regarding the burning of common brick, if you confine yourself to the ordinary common down-draft kiln, either rectangular or round, I speak in favor of Mr. Morrison's system; but the kilns in the paper are not confined to continuous kilns; rather up-draft kilns. I consider that we have the right to de-

bate the question openly as published.

Professor Orton: I happen to be the man who threw the bone of contention into the assembly which has given rise to this discussion, and, if it will do the gentlemen any good to know, I will say that I meant the down-draft kiln as commonly accepted, and not the continuous kiln. If we get into that question we shall be undertaking a good deal, and it needs more preparation than I can bring to the subject at this time to make a fair comparison with the other two types; but most of us have had an opportunity to observe these two different types. As I formulated the question, I do not recollect putting in the word "common." I see that the discussion has not covered the point which the question distinctly states—"Which principle is better?" Now, when it comes to means to carry out the principle, Brother Morrison's argument applies very well; but the debate thus far has not been on principles; it has been upon means.

Captain Crafts: I am the only one in this assembly who has experimented with down-draft kilns in making common brick,



H. R. GRIFFEN, Phoenixville, Pa.

which was a down-draft and not a down-draft. I built a kiln of ten arches for 200,000 brick, and I arched it over so that the heat had to come up to the top, and then go down to the bottom, and then up to the top again, before it got away; that was so I could control it. We burned it several times, and, to my very great disgust, it takes just a little more fuel than the ordinary up-draft kiln, and while our top brick are light and the middle benches are all right, the lower benches shrunk. If anybody can explain that, I would like to have it done.

Mr. Dibert, Pittsburg: I would like this matter of the continuous kiln to come up in the discussion, because I would like to know the cost of burning a continuous kiln. I believe the common-brick men would like to know what is really the cheapest way to burn.

President Brush: We shall have to rule that out of this debate. We will have another heading under which you can call that up. I would like to hear from Mr. Rogers, of Rochester, on this debate.

Mr. W. H. H. Rogers: I am not a practical man, and would not be able to give very much information on the subject.

Mr. McAvoy: As to which principle is the best for burning common brick, up-draft or down-draft, I would say the up-draft is the best, for the following reason: In burning brick with the up-draft the heat has a freer passage by and through the ware burning, being the natural way for the heat to go. The brick are not burned or the shrinkage does not take place until the brick are thoroughly heated through and through, but this takes place quicker than by the down-draft. In the down-draft kiln the heat has to force its way down against its natural bent, and makes its way slower, penetrating the brick more thoroughly than in the up-draft, naturally burning a harder, denser brick, but requiring longer time and more fuel. For this reason I think the up-draft the better principle to burn common brick.

THEORY AND PRACTICE IN BURNING BRICK.

Mr. S. S. Chisholm: I am not a practical brickmaker nor a practical brick burner, but, having been identified with the brick interest for some years, I was glad to see this question on the programme. It occurs to me that the true drift of this discussion would lie in the direction of saying something of the principle, the theory, of these two systems of burning brick. What is the object of putting fire into clay? It is, as I understand it, to fuse the particles, to make the brick hard. Now, it seems to me, as an unpractical man, that if we send heat through a body, the body absorbs a certain amount of this heat and the balance passes away. If we make a certain heat, say 1,500 or 1,800 degrees, if you like, and hold that down, we more thoroughly cook or fuse the particles, and in this way can we not do it with a less expenditure of fuel? It is quite proper to talk of the means, but as we have this one point before us, is it not quite advisable for us to confine ourselves rigidly to that point, and after we have decided the best principle to be one or the other, then it is easy for the practical men to say which is the more profitable. I would like to hear a scientific man, like Professor Orton, give us the general theory of the up and down-draft. Mr. Eudaly has had experience in this. He owns up-draft and down-draft kilns, and has made a study of it probably for as many years as most of the gentlemen here, and more thoroughly, and it occurs to me that for the benefit of this Association we should go into the theory and the principle of this thing, and get at that if it is possible, and if either of these gentlemen chooses to give us the results of their scientific research we might be very materially benefited by the debate.

Mr. Eudaly: As Professor Orton will no doubt agree with me, to undertake the discussion of this question as it should be discussed would take really about all the time we have at our disposal in this Convention, and perhaps not profit any one very much. I look at this question in this way: Which principle is better? Of course, we understand that the burning of common brick only is meant. Now, there are several ways to look at this question. Let us understand what we mean by "better." Let us take our bearings. Do we mean it to be understood that we are discussing this question in order to arrive at the thing or method that will give to us the most dollars and cents for our time and capital invested?

Voices: That is what we are here for.

Mr. Eudaly: Or do you want us to go into some rolling over of scientific terms of one kind and another, and talk about the impact, and all that sort of thing? What do you want?

A Voice: It is the cash we are after.

Mr. Eudaly: It is the cash you are after. That is quite a different thing from what is often discussed. I have found, gentlemen, in my experience, that some things which bring us the cash, that we all so much desire, somehow or other often conflict with our ideas of chemical and other scientific conclusions. These differences will no doubt in time be reconciled. Now, gentlemen, when it comes to burning with an up-draft or down-draft kiln common brick, let us keep in mind the question of cash at the end of the month, and that is the only way for us, as business men, to discuss this question. That brings

us, then, at once to the question: Where are we located? What are the demands of our market? What do we mean by common brick? Do we mean common brick as in St. Louis or as in Philadelphia? I will name those two cities with the permission of the gentlemen from those places. A common merchantable brick in Philadelphia is quite a different thing from common merchantable brick in St. Louis; let us understand this. I do not exactly know what the demands of the market in Buffalo are. I have not acquired this information. I know what the demands are in New York, and I beg to assure you that the demands for a common merchantable building brick in New York city are quite different from those in Philadelphia. At least I have been credibly informed that such is the case. We must keep these things in view.

Now, gentlemen, if you are in a locality where you burn your common merchantable brick, and where you can ship your arch brick, whether they be ragged or not, discolored or not—where you can ship arch and salmon brick, from the top to the bottom of your kiln, I would advise up-draft kilns. Most people who burn up-draft kilns get salmon, or soft, brick on top. May I ask Mr. McAvoy a question? Mr. McAvoy, will you be kind enough to state how many of what you call salmon brick you are required to have for your market in Philadelphia? Say, of 100,000 brick, how many of them would be salmon?

HARD VS. SOFT BRICK.

Mr. McAvoy: Under the present conditions of trade in Philadelphia we try to do without salmon brick at all. They go into speculative operations, and we do not care to sell them.

Mr. Eudaly: I mean the trade.

Mr. McAvoy: We are all in the same box.

Mr. Eudaly: What percentage will it average?

Mr. McAvoy: We are not giving at the present time much more than 5 per cent. of salmon the season through; it used to be 20 per cent.

Mr. Eudaly: It has changed very recently.

Mr. McAvoy: It used to be 20 per cent., because we got such good prices for the other brick and salmon brick, and we did not stop to think how much we were making; but as the profits were cut down and the city became overpeopled, and the building of dwellings became merely a matter of speculative building—and the wise and conservative brickmaker keeps away from that—it has developed a higher grade brick or percentage of hard brick. We are getting away from the salmon brick. For that reason a brickmaker who pays thorough and strict attention to the business can get it down to 5 per cent.

Mr. Eudaly: I know that some can occasionally burn brick down to 5 per cent. of salmon brick, but that is not the question. I understood they could handle a limit of 20 per cent. of salmon brick in Philadelphia. I have heard gentlemen make the assertion that it made no difference in some cities about salmon bricks—everything went, and they got the same price. I have heard that statement. Now, will some gentleman here from New York city tell us what percentage of soft bricks are sold in that city? What percentage will be allowed to go into a building?

Mr. Brockway: There are none permitted to go into most of the buildings. We have no demand for soft brick, and they are not allowed to be used in our building operations.

Mr. Eudaly: Is there a man here from St. Louis? Is there a man here from Pittsburg who will say what percentage can be put in a building?

Mr. Dibert: Our building laws prohibit them from going in.

Mr. Eudaly: I ask as to Buffalo. Let us get at the facts and understand what they are.

President Brush: Our architects specify all hard brick. (Laughter.)

Mr. Eudaly: That is exactly what I want to get at. I say if soft brick will sell we are foolish to make them hard. Now, there are localities where a certain percentage of salmon brick and arch brick work off with the hard brick of the kiln. That

has been and is now being done in many localities in the country. Where this is the case, and where all hard brick is not required, and some soft brick will be received, I believe, gentlemen, that an up-draft kiln is the better. When I say an up-draft kiln, I do not mean a kiln you build every time you burn, but a clamp kiln, with permanent fire places, that stands from one burning to another, and where you can sell some soft brick, I believe, from the standpoint of dollars and cents, that an up-draft kiln is perhaps the better.

Mr. Taylor: I think we have gotten a little away from our question. The question is, Which principle is better for burning common brick—the up-draft or down-draft kiln? This principle must be proven by its utility. What we want to do is to make a good brick at a profit. Now, this question of up and down-draft kiln is about thirty years old, surely, probably older, and the selection of a kiln, I think, would be governed first by the skill of the brickmaker; second, by the character of the clay that he is to use, and, third, by the amount of capital he has to invest in his plant. The respective merits of the up and down-draft kiln must certainly be very close; because for more than thirty years this question has been constantly before the trade, and to-day is as far from settlement as in the beginning. It is like the old question we had at Louisville some years ago—the question of efflorescence. We know very little about it, but have to do the best we can in our locality.

Mr. Eudaly: I am going to state to you a thing I know to be a fact, for I have tried it to satisfy my own curiosity, and from a business standpoint, too. You can burn in a good down-draft kiln all hard merchantable brick—I am talking about common building brick. I am not talking about paving brick and pressed brick, but good, hard, merchantable building brick. You can burn in the down-draft kiln a brick, all hard, for about the same that you can burn the brick in the up-draft kiln as they are usually burned. You can burn them all so that they will pass. There is a little difference in handling the brick in favor of the up-draft kiln.

President Brush: If it is your pleasure, we will drop this question, as it seems to have been pretty generally discussed. You can decide it in your own mind which you want. (Laughter.) You pay your money and take your choice.

Secretary Randall: This brings us to the questions for general discussions, and we will therefore take up the first:

IS IT BEST TO LEAVE FURNACE DOOR OPEN WHEN
WATERSMOKING OR DRYING OFF A KILN
OF GREEN BRICK?

Captain Crafts: I do not think it makes any difference whether you leave the doors shut or open as long as you are simply drying them; you cannot hurt the brick in any case.

Charles Bray: Our clay in Montana contains a great deal of alkali, and I have tried both ways of drying brick, with the doors open and the doors closed, and I find invariably if we dry off the brick with the doors closed the brick are whitewashed, and if we leave the doors open we seldom get a whitewashed brick.

Mr. Pike: That comes from the alkali coming to the surface of the brick, and there is not current enough to carry it away through the stack. We cannot very well watersmoke them without having the doors open to take the draft away.

Mr. Bray: Another thing I have always noticed: if the wind would be blowing when we were watersmoking we would not have any whitewashed brick.

R. B. Morrison: This is an important point. The gentleman's explanation that when he had the doors shut the brick were whitewashed, and when they were left open they were not whitewashed, is to the point. I believe it is pretty well established that bricks are whitewashed in the kiln because the heat is applied too rapidly, too high a degree of heat too soon; and it follows that if he puts the doors on he gets a higher degree of heat. If you leave the doors open you avoid the risk of too much heat, because as the volume of cool air comes in

the door it has a tendency to reduce the temperature; we apply the heat too rapidly, and that causes whitewash.

Mr. W. S. Purington: The same principle applies in burning brick as in drying, and you must have air to absorb the moisture, and I think it is hardly possible to get as good service with the doors closed as with the doors open, until the steam is entirely off the kiln.

Chas. H. Merrick: The manager of a large gas plant this fall said to me: "You are wasting too much heat." I asked him to explain what he meant. He said: "Come down to the gas office and I will show you something." He took me into the office and threw out a large blue print, and said: "This is the way we manage our heat. You have been at the gas works and you understand what a great degree of heat we require." In this blue print I found that he had flues running along the side of his furnace, letting the heat in at the bottom, carrying it back and forth, until he reached the top of the arch of the furnace. On the top he let in heated air. He said: "That is where we get good combustion. Carry the heat in



GEO. C. HICKS, Boston, Mass.

through the bottom of the furnace, through flues, carrying it backward and forward, so that the cool air you let in will not be pounded back by the hot air, and you will get a much better effect, a hotter fire, and burn your brick easier. Let the air in at the top of the furnace, well heated, through the flues on each side of the furnace."

Mr. Taylor: There is a question which we are all very anxious about which seems to have cropped out in this discussion—the answer to the question, how to get rid of the stain on our bricks. Mr. Bray has answered the question authoritatively. Mr. Morrison has followed in the same line. When the doors are shut the circulation of air through the kiln is less than when they are open and the heat is greater. The generation or dissolution of this alkali, which stains the face of the brick, is greater, and the circulation of air is not rapid enough to carry it out; but when the doors are opened, so that a good draft of air can get through and keep up a rapid circulation in the kiln, the material which is dissolved and stains the brick is carried off rapidly so that it does not affect the face of the brick.

Professor Orton: There is one point mentioned, perhaps

more than once, relative to the carrying off of the alkali. I do not think that the gentlemen who are using that term can really mean to say that alkali is actually carried away by the draft. Is that your idea, Mr. Taylor?

Mr. Taylor: My idea is that the staining matter let loose by the heat is carried away by the draft instead of being precipitated on the face of the brick to stain it. I do not know whether it is alkali or whatever it may be.

COMPOSITION OF EFFLORESCENCE.

Professor Orton: The alkali which Brother Bray has mentioned and the efflorescence which appears on the brick are nothing more or less than soluble salts of some description, generally of lime; but in the West they have great quantities of alkali proper, which is potash or soda. The material is soluble in water and not soluble in air, and it exists in the clay as such. When you put the clay into a kiln containing more or less water, as all bricks do when they go into a kiln, and then proceed to pass warm air over the outside of the brick, gradually increasing the temperature, that water creeps to the surface and is taken up by the atmosphere. It always has a tendency, of course, to carry this alkali out in solution to the surface of the brick. Sugar, if placed in water, becomes incorporated with it for the time being, a perfect solution; you cannot see that the sugar is there, but you know it is there, and if you dry a teaspoonful of the sweetened water you will obtain the sugar. It is so with the alkali in the clay originally. You have not gotten rid of it, because it is not on the surface of the brick. It is all there, just the same. It is not carried away by the atmosphere, because it cannot be transported. It may be brought to the surface or left in the clay by varying the conditions under which the evaporation takes place. The faster evaporation takes place the greater the tendency to transfer it to the surface of the clay and leave it there, and the slower the evaporation the less you will see of it. For that reason it is proper to maintain as large a flow of air through the kiln as possible, with the constant rising temperature, but after you get beyond that you simply burn clay for hardness.

E. M. Pike: As Professor Orton has touched a point which I do not understand, I ask him this question: It has been stated that this alkali, or whatever it is which is on the brick, is not soluble except in water. How does it get out of the kiln—because it comes to the surface of the brick in a moist condition? Does it evaporate when it comes to the surface of the brick, and then pass away in the form of steam at the early stage of burning, as it is stated that it does not go away except in the form of vapor? Does it go off early in the stage of burning? It must go, because we do not have it when the doors are open. When the doors are open it passes away.

D. V. Purington: As I understand Professor Orton, by drying so slowly that this action he speaks of does not take place we prevent the exudation of this alkali or soda; it remains in the brick.

Mr. Eudaly: There is some confusion about this matter, and I believe Professor Orton has left an idea in the minds of some of our members he did not intend to convey. The statement that allowing a greater flow of air through the kiln dries slower is not correct.

R. B. Morrison: The temperature is lower.

Mr. Eudaly: I do not believe Professor Orton intended to say that the circulation of a larger volume of air causes the brick to dry slower. He said this, however, that the slow drying did not bring this base of salt to the surface of the brick, and after that he confirmed the theory of the other gentlemen about leaving the doors open and having a great deal of air passing through the kiln was better, and the two do not go together. One or the other is wrong.

W. D. Richardson: There are two points about this. We have got to go into the subject deeper, and it is a question whether we had better take it up now or leave it until we reach the question, further on, "Can Whitewash Be Prevented from Coming on the Surface of a Green Brick by Varying Its

Treatment in a Drying Tunnel?" If we are going to discuss these questions now, I should like to hear something about them; if not, let us leave this one until the other question comes up.

D. H. Heager: I call attention to the fuel used in water-smoking, of which nothing has been said. If I use wood after drying off it is not apt to make this efflorescence; whereas, if sulphurous coal is used, it has a tendency by smoking, combined with the minimum circulation of air, to produce what you are talking about. Would it not be well to have Mr. Orton explain why it is that watersmoking with wood and a reasonable amount of air will not have the effect of producing these stains on limy clays, whereas watersmoking with sulphurous coal will produce this efflorescence.

President Brush: Gentlemen, just allow me to call you to a halt. We will discuss this question in reference to the coloring of brick later. I know it is interesting to all of you. It is to me, and I know it is to every one in this room, but let us have one thing at a time, and not rush ahead of our programme.

Professor Orton: I was going to localize the discussion by moving that what has been said on this topic, which we have drifted into insensibly, shall apply to this other question, and that we skip the latter when we get to it on the programme. We are three-quarters through with the question, and why not finish it up?

President Brush: Very well; with that understanding we will proceed.

Mr. Gates: I want to say that I have thoroughly tested this matter in a practical test, and I indorse every word that Professor Orton has said here. You will notice, if you think of it a minute, that the edges of the brick have the most of the white on them. These are places to which the air has more ready access, for instance, and brings more of these salts to the surface and leaves them there. I have thoroughly demonstrated by practical experiment that, though these salts are locked up, they are there just the same; they are left on the inside and not brought to the surface. I want to congratulate this Association on having arrived at a point where we can have a man like Professor Orton stand up and give the clear and lucid explanation of this question which he has given us to-day. (Applause.)

D. V. Purington: Are we to understand that in drying brick in a kiln more water passes out through the corners of the bricks than other parts?

Mr. Gates: If the brick is so situated that the corners are exposed more than the other portions of the brick.

Mr. Purington: Take a kiln generally speaking.

Mr. Gates: Yes; more of it appears on the corners.

Mr. Purington: That is a new idea to me.

Mr. Naugle: We are being led away now in this discussion. The question is, "Is it best to leave furnace doors open when watersmoking or drying off a kiln of green brick?" Now, are we not misled a great many times in our own works? I have been bothered with this watersmoking, and it is not in my kilns at all, and there are a good many of us in the same boat. My watersmoking—that is, watersmoking on bottom brick, shale brick, soft mud—is done in my drier. I use an iron pallet on the bottom deck of my car, with large openings. I do not care what kind of burn I make in my kiln, ninety-nine times out of a hundred these brick, whether they are set outside of the kiln or otherwise, with opening in that pallet, are invariably white. Does not that prove it is in the drier? It is a cast-iron pallet, with slots in it about one and one-half inches wide and three or four inches long.

Mr. D. V. Purington: Do I understand you to say that the drying of the brick was all done in the tunnels?

Mr. Naugle: No, sir; not at all.

Mr. Purington: And no watersmoking done in the kiln afterwards?

Mr. Naugle: I say that our discussion has led us to the

watersmoking or burning of the watersmoke on the brick. My brick gets that result in the drier instead of the kiln.

Professor Orton: Are we not calling two different things by the same name?

Mr. Purington: I think we are.

Professor Orton: Watersmoking is a very indefinite term, but as I have been accustomed to use that term I mean the expulsion of the water and gases which come off with the water from the clay, but I do not mean the white matter or other coloring matter which may come from the brick and establish itself on the surface of the clay. That I call efflorescence. There are four or five different causes from which it may come, but it is efflorescence, and not watersmoking. I think it better to add here to the use of the term "watersmoking," merely for drying the brick or driving out the last of the water from the clay. You are not troubled with watersmoking at all; efflorescence is what you mean.

Mr. Naugle: That is what I say; from watersmoking of our brick we have gotten on to the whitewashing of our brick. If there is anybody who can give me any information as to what it is due I would like to know. I am drying my brick in the drier, and this whitewash is deposited on the surface of my brick, which I cannot see until the brick are burned. Taking up the pallet question, where I lay my brick on the pallet, whenever the brick comes in contact with the iron and is protected, that spot is a perfect red. Where the brick is exposed to the hole underneath, that is a perfect white. That is my trouble.

Alfred Yates: I think the most desirable thing is to start a slow fire and get slow circulation. The next danger that you come in contact with is raising too much heat and condensing moisture in the kiln. That will form sweat drops on the green body, whatever it may be, in the kiln, and sulphur from the fires will adhere to that and burn on it as a scum. It may be alkaline solution; there may be an alkali exuded to the surface of the brick.

CIRCULATION AND LOW TEMPERATURE.

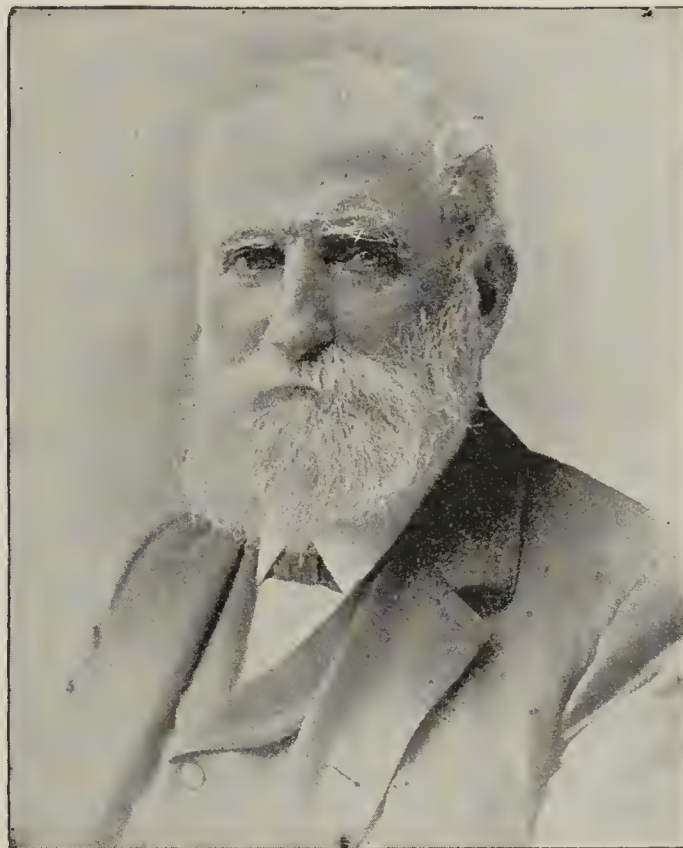
If it is possible to carry off in solution the substance of this scum or whitewash, whatever it is, you can do it by slow watersmoking. This matter refers to fine goods. Just one baiting (firing) a little too quick, too rapid, would throw a scum on the whole kiln and spoil the goods. I have studied the matter carefully, and think that, in watersmoking, to hold down the temperature and keep up the circulation is the salvation of the whole situation, simply condensing the watersmoke in the kiln instead of allowing it to escape as a vapor. Continue to keep a low temperature and a good circulation until the watersmoke has evaporated the moisture; then take the first heat on the clearing and spring your kiln, and continue to keep the kiln settling, or continue the shrinkage, until the goods have had sufficient fire. Regardless of up-draft, down-draft or continuous kilns, a man must take into consideration the material which he is burning, the density and structure of it; of course, he must be familiar with these things to understand the way to burn. The stronger the material the slower he must go; the more porous the faster; but he must keep below the point of condensation all the time if he wants to avoid scum or whitewash.

Captain Crafts: As to whitewashing on brick, I found, when I thought the brick were dry enough and I came to take them out of the kiln, they had what I called a beautiful skim-milk blush. I thought probably it was because they were not dry enough, and the dampness was the cause of the whitewash. The next winter I burned some of the same brick, which had been on the shelves or pallets all the summer, and they were dry as bone. They came out with just the same whitewash. Coming to examine further, I found that the whitewash was only on those parts of the bricks which I had rubbed with a coating of fine sand and sesqui-oxide of iron, known as yellow ochre. That is where the whitewash was, and on those parts where it had not been applied the brick showed the ordinary red.

D. V. Purington: I think the solution of this whole difficulty is to try slower fires, longer time in drying, and a better circulation, and you will get rid of the efflorescence which appears on the surface of the brick.

Mr. Yates: Young burners think they make great progress in pushing the fires at the starting point. If they want a good burn and a cheap burn, the slower they fire in the first stage of the game the better they will come out at the end. Prof. Orton will tell you there are two kinds of moisture in brick, one chemical and the other mechanical. When you commence firing the brick you will find that there remains in the clay chemical moisture, which will commence to watersmoke, although they were set perfectly dry.

Mr. Morley: There are a great many causes for this whiteness on brick. I have had forty-five years' experience, and have discovered some of them. One cause is, as the gentleman behind me says, the fire is driven too fast, and the gentleman from Montana gives another cause, which is dampness, setting the brick too wet. I have found that by taking your bottom pallet, after it stands probably two weeks, before it dries,



CAPT. S. P. CRAFTS, New Haven, Conn.

that white substance will come out on the brick, and it will stay there, and you cannot get it off. We are troubled very largely with this "white miller," as we call it. Often it comes out after the buildings are built in the spring, and it will then thoroughly dry out and not appear again. We have to burn very slowly, and burn with open doors, probably thirty-six hours, at the start. Our brick will blow just like powder—blow into a thousand pieces. We have to be very careful about it.

Secretary Randall: I think this subject is pretty well exhausted. We have discussed it in a similar way for many years. The next subject on the programme is as follows:

"Is It Practical to Set Stock or Pressed Brick Flat to Avoid Fire Marks?"

Mr. J. W. Carson will lead the discussion on the question.

Mr. Carson: I am interested in this question, and I have written a brief paper on it, more to get information than to give it.

IS IT PRACTICAL TO SET STOCK OR PRESSED BRICK FLAT TO AVOID FIRE MARKS?

At the Cleveland Convention I introduced a similar question, but it did not elicit a reply. I am inclined to think some other brother is on the same track I was. There are some shapes of ornamental bricks that leave no choice in the matter; they must be set flat if you would preserve their shape. Now, this is where the shoe begins to pinch. There are serious objections to setting brick on the flat. They require more careful watersmoking and slower burning, using more coal than ordinarily, and there is more waste. Flat setting also induces more or less the black core mentioned in question 5. In fact, I think the two questions ought to be incorporated. Clays of a certain kind and texture (such as the St. Louis or other sandy or loamy clay) can be and are burned successfully set flat, but most of the fire clay and shales that I have met are difficult subjects. For instance, some years ago I was connected with a company on whose property were the two kinds of clay mentioned. We had no trouble burning the red brick flat, but the fire clay would puff out more or less, and sometimes turn perfectly black in the center, and not only black but "cindered;" that is, porous and without substance. Besides the ornamental brick, we were making Roman and ordinary square brick, also set flat to obtain a fire-flashed buff effect. We set them in series of eight or ten high, then reverse and tie. The bricks were dried as thoroughly as our drier would do the job. I think I am correct in saying they were in as dry a state as could be obtained in any drier. The watersmoking and burning were given special attention, but after all I have seen a black core runs right through the series, but without showing top or bottom. Two years ago we built a small kiln holding 5,000 bricks. It was intended for ornamental bricks and special work. We burned it first time with plastic common brick, and the burn was a good one. The second time we filled it with repressed ornamental bricks set flat, and although the exposed parts had good color, over half had a black core. It is worthy of note that we never saw it so pronounced on brick set on edge. Naturally we set about looking for the cause and remedy. Our method of procedure may not be exactly scientific, but it led to a partial solution of the difficulty. The appearance of the brick led us to think that the big trouble lay in the size and density of the block, that the outside of the brick had burned hard enough to stop the exudation of the gases from the interior, and the joints were tight enough to prevent any or sufficient circulation at that point, causing a kind of stewing process to take place inside. We then punched a hole about three fourths of an inch distance through the center of each brick, and found this effective so far as the burning went, but it was objectionable to some contractors, they claiming it would weaken the brick. We next tried coarse sand between the bricks, and this is the method we still follow in burning our ornamental bricks, but it would hardly pay for ordinary square bricks. I may say that we have the same trouble with both dry-press and plastic repress, and that our material is a very hard shale. Now, while I did not introduce either of these questions, I am interested in the solution of both, and hope they will receive your attention. Another point: I have found that flat setting does not entirely prevent fire marks, or, as I understand the question, the setting marks. Unless the floor of your kiln is perfectly true you will find flat setting very troublesome, and while in setting on edge you have always good or fair face, the top and bottom bricks of the flat series are often spoiled for a face brick of any grade. To meet this when setting ornamental bricks we set a square brick top and bottom. To sum up an answer to the question, I have not found it practical or economical to set brick on the flat.

Mr. Hicks: I would say that we set nearly all of our building bricks on the flat. They are made mostly of fire clays, and we have good success with them always. We are very careful to put in between the bricks plenty of brick or sand that is not fusible, and to have the bricks run along until they get a fine balance, and then there is plenty of opportunity for the steam to work out and for the bricks to contract in shrinkage.

Mr. D. V. Purington: Can you burn them as cheaply, Mr. Hicks?

Mr. Hicks: Yes, sir.

Mr. Pike: Do the bricks warp any in lying flat?

Mr. D. V. Purington: I apprehend there is very little, if any, shrinkage.

Mr. Hicks: They do not shrink so much as weak clays.

Mr. Purington: We do not call our clay weak, but we can discount anybody on rapid burning.

Mr. Hicks: The clays of which common brick are made, whatever you call them, shrink more than fire brick clays.

Mr. Fiske: All our bricks are fire-flashed bricks, and are set with that purpose of getting these bright colors. They are fire-flashed, and we could not get the same effect if they were placed face to face. We are making Pompeian, old gold and mottled grays, the beauty of which is produced by contact with the fire.

President Brush: We will now proceed to the next question:

WHAT IS THE BEST CONSTRUCTION OF WALLS FOR DOWN-DRAFT KILNS?

Mr. Eudaly: I will say a few words on this question. It is pretty hard to get the best construction. I have hardly seen it yet. It is pretty hard to get the wall of a down-draft kiln too good. There are a few things which may be observed in building down-draft or any other kind of kilns. The large majority of builders use entirely too much mortar; use as little as possible. You ought not to use any cement, or lime, or mortar where it comes in contact with the heat; just common mud is better than that. Under no condition should cement or lime mortar come near the heat. I would use at the outside four inches of lime; that is all that ought to be used under any condition. If lime mortar is used in the outside four inches, when the kiln expands in the burning it will make several large cracks. If you use mud throughout the entire kiln and no lime mortar at all, you will not see these cracks so much. You think you have a strong kiln, but you haven't. Fire brick used in the building of a down-draft kiln ought to be cut to fit. If you have fire brick in the kiln they ought to be made to fit in the beginning. It should be done in a workman-like way, with as little mortar as possible. It is then asked whether the inside, 9x4 inches of fire brick, the crown of the kiln should rest on the inside. I was talking with a gentleman on this subject, and his idea was that the kiln got hot on the inside and expanded, and if it was tied it would raise up and raise the crown and would not disturb the outside, and when the kiln cooled would settle back again and come into place. I would not build one that way, although it may be a good way. I believe the best way to lay the kiln is to lay your brick down dry without a trowel, and just slush your mortar in until you fill the joint up full, crowding it in, and then lay on another course. Of course, we are inclined in brickyards, in building kilns, to use the poorest material in the yard, bats and soft bricks. For that reason many kilns have not the proper strength, and, not being bound together, as they should be, pull apart. I think any practical, common-sense man can see and understand and ought to know how to build a good strong wall for a kiln. You can build a kiln out of poor material, and use a great deal of mortar, and get a bad kiln. Many people build level with mortar or soft brickbats, and put a lot of mortar in to get it level. The work should be done in a workmanlike manner.

Mr. Adams: I have experimented in the construction of brick kilns with all classes of material, and I have never found any material of the character of clay, sand, lime mortar, or anything else, that makes as strong and durable a structure as a brick kiln constructed with the inside wall built of fire clay and as little mortar as you can use to keep the work level. Another important question, upon which the solidity and stability of the whole structure depends, is that it is very necessary to use none but good, strong, durable headers for your binding courses. If they are not used, the weak header will give way and the inside wall fall in or out, as the case may be. The suggestion of building the inside wall separately would not do, because with the first fire it would fall in and shrink away from the other wall. I build the outside wall two or three bricks higher and fill in and slush with grout, using a large portion of the sand to make it work smooth. Fill in with grout and lay stiffer mortar on the outside again, and use plenty of strong, durable brick; have your headers strong, and lay these with fire clay.

Mr. Eggers: I want to ask Mr. Adams whether he tried to have good, substantial walls in his kilns and have a cavity in the wall—a sort of cool air chamber. Did you ever try that?

Mr. Adams: Yes, and I will never try it again. If you want to build a honeycomb of a wall, that has no substance and nothing that will hold together, build a lot of holes and flues which the kiln men want you to put in. If you want something to stand there, render you service and be substan-

tial, build a solid wall without cavities. You want a solid wall because the pressure put upon a brick kiln under the conditions of expanding and contracting heat is wonderful.

Mr. Eggers: What was the width of the space between the two walls?

Mr. Adams: About three feet. I took the cavities "out" by filling in with brick. (Laughter.)

Mr. Eggers: In certain forms of construction in Europe and other places they fill in between the walls with sand, and it is maintained that the walls will stand up good. Now, the great trouble with us must be that the walls are too thin, not strong enough, or you would not have so many cracked kilns. I differ with Brother Adams. The construction of the kiln with the cavity between the walls is good, and they do not crack. I know some years ago, when they had great difficulty and had furnaces which were subjected to excessive heat, that the only thing to prevent the walls from cracking was the space between the walls for the circulation of air. Take, as an example, a smokestack with a cavity in the wall; such stacks do not crack. The wall must be strong and substantial, though. Some kiln walls are but sixteen and twenty inches in thickness. With the heat these kilns are subjected to it is impracticable to have such thin walls. The walls should be as strong at the top as at the bottom. They ought to be just as strong, even if they are tapered off at the crown of the kiln, as at the bottom, because of the expansion. Otherwise there is nothing to sustain your arch; there is nothing to hold it; it has got to split. I have seen many kilns tapered off so that when they get up to the crown, where the walls should be strongest, they are the weakest, and consequently the walls crack and tumble.

Mr. Adams: I desire to say that I would not criticise Mr. Eggers's version of the hollow wall proposition, because he may have experimented with cavities and found them a success. (Laughter.) I have experimented with them and found them a failure. I have also gone so far as to build kilns of dry clay, building up the outside walls with mud and inside walls with dry dust. I built five kilns, each holding 400,000 brick, outside with mud and inside with dry dust, which were conspicuous failures. The kilns were practically valueless and torn down. I want to say to you that you cannot make the work too firm or solid, and much depends on the structure of the kiln walls. I differ with Mr. Eggers as to the character of the structure. He thinks it ought to be as thick at the top as at the bottom. My experience teaches me that it ought to be lighter and thinner as you go up, well built and wider at the base to sustain the walls, because the higher you get, if it becomes top-heavy and leans out, it will give way. I build four feet at the bottom and taper off toward the top. Nothing is saved by using poor material, but it pays well, in building kiln walls, to use good, hard brick for headers, and plenty of them, at least every fourth course. The headers should go entirely through the wall, thus binding and holding the wall as one solid mass. Mud stiff enough to hold stretchers in their places should be used, and all inside work should be thoroughly and carefully grouted.

W. S. Purington: In regard to this matter of mortar. We have used lime mortar largely in the construction of our kilns. When building of fire brick we use best fire clay, but we have found, since we built some of them over, that the best material is our own shale, with a mixture of a little sand, enough to work it. There is no material possibly to be found anywhere that will do as good service in the crowns as the shale itself, for the reason that the hotter it gets it unites the bricks and runs into the pores. After a few burns the joint has gone, almost, and the shale has been absorbed, as it were, by the fire brick. Since we built our crowns of that material we have never used any other.

Secretary Randall: It is very desirable, in discussing these questions, that the gentlemen shall read the questions and confine themselves strictly to the one under consideration. We drift badly by jumping the fence. We will now take up the question:

WHAT IS THE BEST ARC OF CIRCLE FOR THE CROWN OF AN OBLONG, SQUARE, DOWN-DRAFT KILN?

Mr. Pike: I say the flatter the arc of the crown the better the kiln. The flatter the arc is, the better for the burning.

Mr. Yates: I agree with Mr. Pike that the flatter the crown the more economical, probably, the kiln will burn, and the better opportunity you have to get heat to the bottom of the kiln. Heat or air will rise the minute you raise the temperature; the higher you get it up the more trouble you have; the closer the crown is to the goods the better it is. A semi-circular crown will carry its own weight, and, of course, the higher you put the crown the less strain on the kiln, and the lower you put the crown the more strain.

Mr. Adams: I want to ask Mr. Pike if the best arc for a circular down-draft kiln is that which falls down the quickest.

Voices: Yes.

Mr. Adams: All right. Then he is right. (Laughter.)

Mr. Eudaly: We may laugh about this, yet this question is being asked all the time; people are anxious to know what the



J. W. CARSON, LaPrairie, Ont.

best arc is, and some are arguing for a half circle and others for a flat circle. The best one is the one that brings the most money. I do not believe it is wise to build a crown or a kiln on a half circle. I do not believe any one can make the crown of a kiln on a half circle stand. If you build the crown of a kiln on a half circle and do not back it up—that is, let it stand from the spring of the arch without being backed up on the sides—it won't stand one fire, but if you back it up on the sides you change the relative bearing of the crown, and it ceases to be a half circle. The pressure of the kiln is not down where you started the crown; it is up above, and therefore you no longer have a half circular; you have an arc of a circle. In building a square kiln eighteen feet wide I found that five and one-half feet rise gives the best results. I used to build five—the real scientific calculation brings it to five feet for a kiln eighteen feet wide—but the crown will settle some, and I find that to make it five feet and a half it stands better, and about the same proportion for any other width is right.

Mr. Taylor: This is an important question—as to what is

the best are of a circle—and we have two things to consider. Brother Pike is right, but he left us in a hole. The flatter the arch you can make the better it will stand up is all right, but my practice has taught me that the are of a circle is not the proper thing to use for the crown of a kiln. I use what is called an elliptical arch, or three-center arch, and that brings into play the edges of the semi-circular, which, on expansion, lifts the crown, which Brother Endaly says truly is wrong to have. By having a small quarter circular or section of a circular, and then throwing a flat arch over the center, you get a minimum of expansion, because you have the shortest length of crown to get hot, and you have the advantage of this lifting, which theoretically goes with the semi-circular arch. I call on Mr. Fiske to corroborate this. I have built these arches in Boston and have never had one fall in. These arches of the class that I built in Mr. Fiske's factory in Federal street, Boston, used to lift five inches every time in firing, because they were practically bottles, the heat being bottled up inside. I merely state this to show the immense strain that was brought on the crowns. Practice has taught me that the three-center or elliptical arch is the most satisfactory.

Mr. Endaly: You back up the wall against the larger radius on the side?

Mr. Taylor: No, sir; the smaller radius on the side.

Mr. S. S. Chisholm: I think the information we got from Mr. Endaly is what we want. We want to get at the facts and know what the best are is. If we are going to build a down-draft kiln with an arch, let us know what that is. I may say that we have found by experience in building kilns that the nearer we get to five or five and a half feet circle in the crown the better they stand. Mr. Endaly says a semi-circular arch will not stand. No man with common sense could advocate a semi-circular as a crown. I speak of that with the understanding that the higher you have the crown the better it would stand and the flatter you made the crown the better it is for the burning of the kiln, but the harder it is on the kiln walls. My experience teaches me that it is of interest to all parties operating down-draft kilns or kilns with a dome to make the arch as flat as they can hold it. The higher you get the fire the more trouble you have in getting it down, and the flatter the arch the quicker it will come to the bottom of the kiln, and that is where we want it. As heat rises, the higher you get it up in the crown of a kiln the more difficulty you experience in getting it down.

Secretary Randall: The next question on the programme is:

UNDER WHAT CONDITIONS IS THE TIGHT FLOOR OF A DOWN-DRAFT KILN BETTER THAN THE PERFORATED FLOOR, AND VICE VERSA?

Mr. Taylor: I would like to hear from Mr. Penfield on this subject.

Mr. Penfield: Jim Porter, down on the Ohio river, would say. I am not saying that it is so; that for burning paving brick he would not have anything but a tight floor, with square holes, about four inches square, two feet apart. He does not have to bother with his floor.

Mr. Taylor: Mr. Penfield is identified with works on the Raritan river which I visited. Before Mr. Penfield took control of it the proprietor explained to me that the kilns were built on the down-draft principle, with clean floors, but by neglect they had got clogged up, and they found they turned out as good work after the floors were clogged up, and they discontinued the cleaning out.

Mr. Penfield: We have taken all those bottoms out that were clogged, and put in straight open floors. We found that the Superintendent was much mistaken in thinking it was a good plan. It was only a make-shift. We simply cleaned the floors out and put in a good perforated bottom.

Secretary Randall: The next question is;

WHAT IS THE CAUSE OF BLACK CORES IN A RED BRICK WHICH IS OF A NORMAL COLOR OUTSIDE?

Mr. Taylor: I suggest that this is a scientific point, and call upon Mr. Gorton to open the discussion.

Mr. Gorton: This is a question which, I think, can best be answered from a chemical standpoint. The black core is due to the formation of ferrous silicate and union of iron into various combinations with the silica. In many cases where that condition of affairs exists the iron is present in a ferrous oxide, probably as a carbon, and if the heat is raised slowly enough the iron is oxidized after the combined water and combined acid is expelled. If the heat is raised too rapidly and the iron has no chance to oxidize, then the ferrous oxide is expelled.

Captain Crafts: We have black cores in our brick, and always, in such cases, go to the foreman and tell him he is putting too much coal dust in the brick.

Secretary Randall: We will now take up the paper of Prof. Heinrich Reis, on "The Clay Resources of New York."

Prof. Reis: I rather feel that I am talking on a subject concerning which most of the members know considerably more than I do, and therefore I have boiled down my remarks as much as possible.

THE CLAY RESOURCES OF NEW YORK STATE.

A recent writer in the Clay-Worker remarked not inaptly that New York had pushed her clayworking industries more vigorously, perhaps, than most of the other States. As a result of this she stands at the present day fourth in the list of States supporting various branches of clayworking industries, only Ohio, Pennsylvania and Illinois being ahead. If we were to consider common and pressed brick alone, then New York leads. It is of interest, therefore, to know what resources she has to foster such an active industry. Roughly speaking, we may say that New York State has three classes of clay materials, viz., refractory clays, plastic brick and tile clays, and shales. The refractory clays are found only on Staten Island, where nature has been kind enough to drop one end of that great belt of fire clays which extends across the neighboring State of New Jersey; but nevertheless this small piece is thankfully received and is actively used in the manufacture of fire brick and gas retorts by Messrs. Kreischer Bros., at Kreischerville, on Staten Island. Smaller deposits of a less refractory nature occur, and have been used to some extent for stove linings and stoneware. The plastic brick and tile clays are scattered all over the State. Every member of this Association is acquainted, no doubt, by reputation at least, with that great deposit of clay extending up the Hudson valley from Haverstraw to Troy, and farther still past Glens Falls and Mechanicsville up the Champlain valley as far as Plattsburg. We have here perhaps one of the greatest clay deposits in the country, varying in thickness from ten to one hundred feet, and one which forms the basis for an enormous local development of the brick manufacturing interests. Situated so favorably as these Hudson river deposits are for their economic working, and with such an abundance of material, it is unfortunate that the products of these clays have seldom risen much above the dignity of a common brick. This, however, is not the fault of the manufacturer but of the clay, which, while usually remarkably even in character, runs high in fusible impurities. Still there are exceptions, as, for instance, at Glens Falls, where the Glens Falls Brick and Terra Cotta Company have been engaged for a number of years in the manufacture of brick and terra cotta. Nor must we forget the use of this Hudson valley clay by potters all over the country, its very high and otherwise objectionable impurities making it one of the best of natural glazes.

Stretching westward from Albany to Buffalo we find another series of more or less disconnected beds, along the line of the Mohawk valley, as well as in the bottoms of many of the valleys to the north and south, whose use has developed several local centers of the clayworking industry, as around Syracuse, Rome, Utica, Rochester, and, last but by no means least, Buffalo. The chief application of these clays has thus far been to the manufacture of common brick by the soft-mud process, but around Syracuse favorable results have been obtained in the manufacture of dry-pressed brick, as at Baldwinsville and Canandigua, and paving brick, as at Geddes. Drain tile are not uncommonly seen among the products.

Now we find that many of these deposits of plastic clay burn to a buff or cream brick, due usually to the high percentage of lime in their composition. The nearest of these deposits to Buffalo is at Canandigua, and is being used by the Eastern Hydraulic Pressed Brick Company to make dry-pressed brick. A second is located at Owasco, near Auburn, at which locality the clay burns to a creamy white, while a third deposit is at Newfield. At this place the bluish gray sandy clay is molded in stiff mud machines and burns to a light yellow brick, but with hard firing to a deeper yellow of considerably smaller size. A fourth locality is at Glens Falls, where there is a local increase in the percentage of lime in the clay, which is taken advantage of to make buff ware.

The analyses of the clays from these localities are as follows:

	Canandigua.	Newfield.	Glens Falls. (Blue Clay.)
Silica	46.55	51.30	48.35
Alumina	12.66	12.21	11.38
Iron oxide	4.92	3.32	4.02
Lime	14.02	11.63	15.38
Magnesia	4.67	4.73	3.17
Alkalies	2.05	4.33	6.05
Water	.90	....	....

There are other clays in the State, namely, at Kreischerville, Staten Island, and at Northport, Sea Cliff and Wyandance, on Long Island, which also burn to a yellowish white product, but in their case it is due to a small percentage of iron in the clay and not to an excess of lime. The Long Island ones have been little used, and it cannot be said with certainty that the beds are of very great extent.

Stretching across the southern part of New York State, from Lake Erie to the Hudson river, is a great formation of interbedded shales and sandstones, mostly the former, and in the southwestern part of the State almost entirely so. These shales are sometimes quite siliceous, but at other times approach somewhat closely in composition to some of the shales used for paving brick or sewer pipe in Ohio or Missouri.

In making this comparison of the relative merits based on composition I do not wish it understood that I believe in the possibility of an analysis explaining all that it is necessary to know concerning the qualities of a clay, for, on the contrary, I regard it only as a partial indicator of the properties of such material, but in this case have no other indicative tests to supply. It is within a comparatively short time that these shales of southern New York State have come to be used, but they are now worked at Jewettville, Angola, Hornellsville, Jamestown, Alfred, Alfred Center, Corning, Elmira and Cairo, and worked for a variety of purposes, such as making sewer pipe, terra cotta, paving brick, roofing tile and dry-pressed brick. It has sometimes been found that the best results are obtained by mixing the shale with a certain proportion of clay, usually to be found in one of the valley bottoms near by, the shale supplying stiffness in burning, while the clay, by its easier fusibility, acts as a binding material. The analyses of a few of these shales is given below:

	Hornellsville.	Angola.	Alfred Center.
Silica	64.45	65.15	53.20
Alumina	17.77	15.29	23.25
Iron oxide	7.04	6.16	10.90
Lime	.58	3.50	1.01
Magnesia	1.85	1.57	.62
Alkalies	4.57	5.71	2.70
Water .....	....	....	6.30

If New York State were out on the prairie region these shales would no doubt long ere this been supporting many paving brick works, but New York cities have been slow to take up brick paving, because of conditions unlike those of their sister cities in the central States, where bricks were first used as a paving material largely from necessity, and then found too good to be parted with at any cost. It seems to me, however, that these shales are destined to play an important role in the future clay developments in this State, and I trust that future efforts in this line will be crowned with success. (Applause.)

President Brush: If there are no remarks on this paper we will proceed to the next order on the programme.

Secretary Randall: It is said that the unexpected always happens. The one question on which we thought there would be the largest volume of music during the session is the one on the programme next in order, "Using Heat from Cooling Kilns for Drying Purposes," on which a paper was to have been prepared by Mr. Robert Lyle, of Perth Amboy, N. J. To our disappointment and surprise, we find that it is well-nigh liable to go by default. The gentleman who promised to read the paper writes that he cannot be present. This is a question which has agitated the minds of a great many paving brick manufacturers throughout the country, and it is a keen disappointment not to have the paper. Mr. Eudaly has consented to step into the breach and give us what facts and figures on the subject he can with very short notice.

Mr. Eudaly then discussed the subject, but owing to his lack of preparation the printing of what he said was, at his request, ordered withheld until he should have time to prepare it in proper form.

Mr. McAvoy: In relation to this subject, the first two years we dried our brick by steam, and that cost a good deal of money, as you all know. We could not keep a separate account of the drying, but it cost its share. We decided to try this principle, after a talk with Professor Richardson, and went home and started in at it. We tackled the waste heat with a ninety-inch fan and drove it in over the steam pipes, and saved

a good deal of fuel. Then we got a little greedy, and tried to take some of the real article from a burning kiln, and the rest of the story was told in the Clay-Worker—we were burned out, as you know. We then constructed brick buildings, a sixteen-track drier, and a flue, 5x4 feet, covered with iron and paving brick. The fan is exhausted at the same time that it is discharged. The only thing it costs us now is the amount of the fuel that creates the steam to run a 12-horse-power engine, and we dry 40,000 bricks very easily. They are down-draft kilns. If you want to dry the bricks fast, you can do so. We dried some in nine hours, but sent them back to the dry pan. If you want to dry them slowly, run the engine slowly; do not let your moisture get out or back in too fast; keep it in a little while, and take the cars out two or three at a time, and dry them slowly. Our drier holds 90,000 bricks. A forty-eight-hour brick is a good brick. We have no necessity to dry them faster, as that is fast enough. With twenty-five tons of coal we can get the same results which would ordinarily require one hundred tons, so that we have heat to burn.

Secretary Randall: The essay on "The National Brick Man-



PROF. HEINRICH RIES, New York City.

ufacturers' Association as an Educator," by Mr. W. D. Richardson, is next in order.

Mr. Richardson read the paper.

THE N. B. M. A. AS AN EDUCATOR.

To one looking backward upon a long and active life devoted to the art of brickmaking, it seems to me there should be two considerable sources of satisfaction and gratulation.

First—That he has received adequate compensation for his work, that his business has been financially successful, so that he has been able to obtain for himself and family the social and educational advantages of his time and place, to provide for them the comforts and some of the luxuries of life, and to secure a competence for his declining years, and, perchance, for his sons a better start in business than he had himself.

Second—It must also afford him satisfaction to review the progress and advancement that has been made in the art of brickmaking in his time, the improvements in methods and machinery, in systems of drying and burning that have resulted in a better product with less drudgery and uncertainty; and to feel that he has himself contributed somewhat to this advancement, has been a part of it, that by his devotion to his art brickmaking has become to his followers a more desirable if not a more profitable oc-

cupation, one requiring more brains and less muscle, more scientific methods and less "rule of thumb."

That there are those in this Convention who do enjoy this satisfaction we have abundant proof, and it behooves us all to consider and adopt such means as may enable us likewise in the future that is bound to come to enjoy this same satisfaction that results from aims and efforts properly and systematically directed to the profitable and successful conduct of our business and to the advancement of the ancient and honorable art to which we have devoted the best years of our lives. In order to promote our interests in attaining these ends we have formed this National Brick Manufacturers' Association of the United States of America. In doing this we have entered upon a work of education—for ourselves and for those who may come under our influence. Hence, in order to bring before this Convention certain matters deemed important by our Secretary and others, and, I may add, to further a movement that has my hearty approval, I have been requested to speak of the N. B. M. A. as an educator.

That our Association, by means of its annual conventions, is an important educator of brickmakers cannot be questioned. We come here as to a school, to listen to lectures and discussions by those who are best informed upon the problems of our art. We have the privilege of questioning our instructors, both in public session and in the private "button-hole talks" that have become such an important and popular feature of these meetings. If we do not carry away from each Convention some point or wrinkle worth many times the cost of our attendance, to say nothing of the social pleasures and the inspiration for better work, then it is our own fault, a neglect to improve the opportunity afforded us.

Moreover, we who are present are not the only students of this school—a large part of the instruction here given is, by our journals, diffused among the brickmakers throughout the United States and Canada, and even into more distant lands. Thus our Association becomes an important educational force that cannot but uplift and improve the art of brickmaking. But to those of us who have attended these meetings regularly there has come an impression, a conviction that many of the problems which we have discussed each year are apparently no nearer solution to-day than when they were first brought forward; that we review them at every meeting in almost the same language and with the same indeterminate results. Various methods being explained, different causes assigned for the same phenomena, and different remedies suggested for the same troubles, some solving the difficulties in one way and some in another, some basing their opinions upon quite an extensive practical experience, and others evolving theirs chiefly from their own "inner consciousness," or perhaps incited by selfish motives of gain by securing the adoption of certain patented appliances in which they may be interested. But we feel that no man's field of observation is large enough in his regular occupation, in his special line of manufacture, to enable him to collect sufficient reliable data from which to form generalizations of value, even if he had the time, and means, and ability for proper systematic study and investigation. Moreover, the researches into most of these questions must be begun and carried on in the laboratory by a man of scientific training who is alive to the practical advantages that would come to the clayworker from a definite knowledge of cause and effect that would enable him to apply the proper remedy for his trouble and to secure positive and certain results. In fact, we feel that we have talked all around some of these questions, and can go on talking so indefinitely without ever getting to the bottom of them, or without arriving at any positive, reliable conclusions. Hence we have in recent Conventions been moving to correct these defects in our knowledge, and to secure a definite settlement of some of these vexed problems. We have taken two important steps that will, we believe, mark a new era of progress for the clayworking industries of America, and redound to the honor and glory of our Association. The first step was taken in the Eighth Annual Convention at Chicago, in accordance with a resolution of Professor Orton, pledging our support to the establishment in any high-grade educational institution of a course of ceramics. The second step was taken at the Cleveland Convention by the appointment of a committee to undertake a series of investigations and experiments to determine standard tests and specifications of paving brick, and at Atlanta, encouraged by the report of this committee, by an appropriation from the funds of the Association to meet the expenses incurred and for a continuance of the work, and by the expression that this would in the future be an important function of our Association. We all know the results of our action at Chicago. The clayworkers of Ohio, under the leadership of Professor Orton, by a systematic and well-directed effort secured an appropriation from the Legislature for the establishment and maintenance of a Ceramic Department of the Ohio State University. Prof. Edward Orton, Jr., was placed in charge of the department. A beginning was made; the course first laid out for two years has been increased to four years, thus placing the department on an equal footing with the other engineering departments. The first graduates of the two years' course are already in the field, some of them occupying important positions, and, we understand, filling them acceptably. The result of the second step has been such a thorough investigation of the requisite qualities of paving brick as has never been made before in any country, and the report of which will form a monogram upon this subject that will be used for reference by manufacturers and engineers everywhere for all time.

We have reason to be proud of what has already been accomplished through the support and encouragement of our Association. But we must not stop here and rest upon our laurels; the work thus so well begun must be continued. We should devote a portion of our revenue each year to the support of the Clayworkers' School at Columbus. We should give the school official recognition by the establishment of a scholarship to be maintained

by our Association, and likewise provide for the prosecution thereof of investigations into such problems of clayworking as may be designated by us from time to time.

It has been found that it is impracticable to carry on these investigations without the aid of a scientific school or laboratory especially equipped for the purpose and under the direction of a man of scientific attainments and practical knowledge of our art. The German brickmakers have for many years, through their National Association, supported a technical school which has pursued a system of study and investigation that has had a marked influence in producing better and more economical results. We have such an institution at Columbus. Let us make the most of it. Let us support it to the utmost of our ability. Here is a grand opportunity for our Association to do a noble work, to make good use of our surplus revenues by affording means for worthy young men to acquire a technical education in our art, and by conducting a systematic series of investigations, and collecting and dispersing definite information of ceramic problems that will be far reaching in its influence upon the advancement of the clayworking industries of our country, and will elevate our business to that status in the industrial world which, by reason of its important bearing upon the aesthetic and practical well-being of man, it is entitled.

Mr. Richardson also offered the following resolutions:

Resolved, That the Association hereby appropriates for the ensuing year the sum of \$250 to be expended, as hereinafter provided for, in making a scientific investigation of some practical problems common to the various clay industries here represented.

Resolved, That the expenditure of this fund shall be placed in the hands of a committee of five, of which the Director of the Department of Clayworking and Ceramics of the Ohio State University shall be ex-officio chairman, and of which the other four members shall be elected by ballot.

Resolved, That this committee shall enter into negotiations with the Board of Trustees of the Ohio State University, and shall offer to maintain for one year a scholarship of \$200, and also to furnish to the department any special supplies, apparatus or appliances necessary to the work of such a scholarship, to a value not exceeding \$50, providing that the said board will agree to remit all fees whatsoever, and to allow a storeroom account, not exceeding \$10 per term, to the recipient of the scholarship.

Resolved, That this committee shall, on satisfactory conclusion of such arrangements as are proposed in Section 3, make public announcement of the creation of the scholarship, to take effect with the opening of the University in September, 1897, together with terms of admission and the requirements of the position, and that they shall in due time select and appoint from the list of such applicants as may present themselves that one who in their judgment is best fitted by natural ability, previous scientific training and practical knowledge of the clay industries, to fulfill the duties of the position.

Resolved, That the duties which the recipient of the scholarship shall agree to perform shall comprise the prosecution of such investigations into the problems of the clay industries as the committee shall designate, and the chairman of the committee shall actively plan and direct; that he shall be required to give to the prosecution of such work not less than one-half of each college day during the college year, and that he shall be allowed to take such other studies in the university curriculum in the unoccupied half of his time as his previous training will allow him to carry.

Resolved, That the committee shall make a report to the Association, as soon after the completion of the year as is convenient, of the results of the investigation, together with all charts, drawings and tables which may be prepared, and an itemized statement of the disbursement of the fund appropriated to its use, and that the report shall be published in the official organ of the Association for the benefit of all concerned; also, that the subjects to be investigated shall be chosen from a list of all such as are formally proposed in writing by members of the Association and filed with the committee before July, 1897.

Resolved, That it is the sense of this Association that the collection and diffusion of more accurate knowledge among its membership is an important part of its work, and that it hereby announces its intention of employing its whole influence and a part of its financial resources each year toward the attainment of this end, under the plan here inaugurated, or some other, as may seem expedient from time to time.

TECHNICAL EDUCATION FOR CLAYWORKERS — GENERAL DISCUSSION.

Captain Crafts: In this connection I will state that a young man, a nephew of mine, went to Germany from Cincinnati and came back loaded with information, which is found of great value to the Rookwood Pottery.

Mr. D. V. Purington: I suppose, Mr. Chairman, that the proper discussion of this paper of Mr. Richardson's will come up under the discussion of these resolutions, but I wish to say that everything he has written has certainly struck a responsive chord in my heart. I want to add to what Professor Richardson says my little mite in behalf of the work being done at Columbus by Professor Orton, which was started, as he says, through a resolution adopted at our Convention at Chicago, and carried out largely by the Ohio Brick and Tile Association and

the indefatigable labors of Professor Orton himself. I do not know whether we are going to have sufficient funds to carry out the suggestion made by Mr. Richardson, but I want to say that I will be one of ten men, in case there are not sufficient funds, or one of eight, or five men, or, in fact, will do it myself, if necessary (applause), to provide the money for this object rather than have it fail. I do not want to do it alone, but want others to join with me, and take hold of this thing and carry it to its legitimate conclusion, which is success. A few dollars from each one of us will provide for a scholarship in that university which will be of incalculable value to the coming clay-workers of America. Now is the time to do it, and I stand ready to be one of any number to provide a scholarship if there are not sufficient funds in the treasury of the Association to do it.

Secretary Randall: There have been various hints dropped as to the serious condition of our exchequer. We are not in a dangerous condition. We have a reserve, and the reserve is amply sufficient to meet the demands put upon us by these resolutions for the ensuing year. Last year we had some unusual expenditures, which cut down our reserve materially, but we still have a reserve. While our membership does not seem to be quite so large in volume, we are getting in new members all the time, and our Treasurer will show a better state of finances at the close of this Convention than at Atlanta. I do not believe that any individual donations will be required. With our present membership fees and due economy we can carry out the suggestions of Mr. Richardson without any embarrassment. We can carry out the laudable recommendations of Mr. Richardson without any donations. The spirit of Mr. Purington's remarks are in line with what we expect from him, and are praiseworthy; I will join him. I cannot give as much as he can, because I have not as much money, but I will cut down my salary. (Laughter.)

That brings up a question which will be brought before the Executive Committee as to the feasibility of increasing the membership fees. We want to avoid that if possible. We want the largest possible number of members that we can get in this Association, and it seems to me, if we are at all business-like in the conduct of our affairs, we can continue on the present basis successfully. This new departure portends well for this Association. Nothing we have undertaken means so much for the clayworkers of this country in the future as this.

Mr. Eudaly: I am heartily in sympathy with anything and everything that can be done to promote this branch of the school which Professor Orton has in charge in Ohio, or a similar school in any other State, for that matter. I am willing to do anything and everything to promote such interests, and I think we ought to do something along these lines; it is to our interest to do it. We can do it profitably to ourselves and to the good of others. The question in my mind is whether a scholarship is the right thing. I shall want to discuss that quite a little. We want to understand how the institution is run and where the funds go, so that they will do the most good. We want to be a little careful about the scholarship idea. There are other avenues calling for money in connection with the institution and the education of men in the field that will require the money and help the school as well. I just throw this suggestion out at this time so that the members can think about it.

Mr. Cawley: It would be rather a discrimination to have one scholarship. I think that probably it would be better if we could donate the money which this scholarship would cost to furnish apparatus to these people at Columbus. I think probably it would do more good, and would give a larger number of persons an opportunity to benefit from the expenditure. If you give one scholarship, that man will go to one place, and eventually he will remain there, and that one place get the benefit of his education. It might be better to donate the same amount of money to advancing the general interests of the school. There is no question that Professor Orton is doing a great work in Ohio in that respect. If we donate him whatever money we would pay for a scholarship, and let him utilize it

under the supervision of a committee of this Association, it would do more good and be spread out more. I think it would do good all over the country.

Mr. Fiske: I raise the point of order that this discussion is out of order. The question comes up on the resolutions.

President Brush: The gentleman is right.

Mr. D. V. Purington: I take issue with the Chairman and Mr. Fiske on this point. It was in the paper read by Mr. Richardson that these suggestions were made.

President Brush: They were offered in a separate series of resolutions.

Mr. Richardson: They were also in the paper, and embodied in a separate set of resolutions as well. This money which is sought to be contributed by the Association was not for the single object of helping some man to obtain an education in our line, but it was also to provide for carrying on these investigations on these subjects, such as might be selected by a committee from the Association; one was to help the other. You cannot expect that Professor Orton, with his duties, can do the



W. D. RICHARDSON, Shawnee, Ohio.

manual labor involved in these investigations, and he must have somebody who can do that work, who has had some training in scientific work, and must be a man of some knowledge of the clay industry—one who wishes to obtain a greater knowledge of the industries, and who can work under the direction of Professor Orton and do this work for him. It is hardly to be expected that we are going to hire some one to do this work and that nobody be benefited by it. The money already expended has not benefited anybody to any extent, but the money has been given to this one and that one to do certain work. Our idea is that this money should be given to one young man, enough to maintain him for a year at the school. It will enable him to do a good work for himself, and also the work necessary to carry on these investigations.

Mr. Eggers: I think that having this plan emanate from this National Convention will make it much easier for Prof. Orton to secure his appropriation from the Legislature every two years (applause), and to get a sufficient amount to carry on the School of Ceramics in Columbus, O. There has nothing

been said or done to-day that touched my heart so much as when Mr. Richardson read this paper. It is directly in line with my ideas for the last three years, since the time when we proceeded to inaugurate a school for the boys to learn the magnificent art of brickmaking, and I aided Professor Orton as much as I could in getting votes to pass a law to create a School of Ceramics at Columbus. If it would be in order I would be in favor of suspending the rules and adopting these resolutions right here and now. Brother Purington has suggested, if the funds are short, that he is willing to start an individual subscription with others. I will be glad to be one of the subscribers, and there are perhaps fifty or one hundred others in this room who will do the same thing. Let us suspend the rules and adopt the resolutions. Let Professor Orton select the gentlemen to serve with him and carry on these investigations. I make that as a motion; that the rules be suspended and the resolutions read by Mr. Richardson adopted.

Mr. Adams: I approve of the paper in all the points presented, but this is a little hasty and out of order. I suggest that, while we are in sympathy with this movement, and extend our cordial support, and we manifest our hearty co-operation in the direction of upholding the arms of this infant school, which is to be of so much benefit to us in the future, yet this step is hasty, and the proper course for the resolutions is to go to the committee, who will report back to the Association, and the Convention can take action on their report.

Secretary Randall: I wish to say a word to the motion. There is no occasion for unseemly haste. I am in accord with the spirit which actuates Mr. Eggers, and admire him for it, and I believe the same spirit will find voice in every member of the Association when the facts are known. The matter has not been brought before the Convention hurriedly or thoughtlessly. It has been given considerate attention. While there may be individual doubts as to whether we are pursuing the right course in respect to details, we are choosing the best course, as we think, to obtain the desired end. Professor Orton is able to handle this matter to the best possible purpose, and this course has received his sanction. We are not going to contribute to the University without getting some compensation for ourselves. In fact, we are putting the University in a shape to help us. If we contribute this scholarship we are putting the University under an obligation to us to do a work worth many times what it is going to cost this Association. I think we can safely leave this with the Committee on Resolutions.

Mr. Gates: I have watched the school as perhaps few others have watched it. I have watched it as a father who is intending to send his son to it. (Applause.) I have sent my son to it. In going through that school I have been impressed as I have been with no other school that I know of. I have seen there a school in which the boys are so much interested in their work that they have to be almost driven from the school after the close of studies and to which they come before time in the morning. It is very near to me, and I speak with much feeling in regard to it. The ordinary method of getting money from me is with a corkscrew, but I stand ready to fall into line with Brother Purington in anything that he may do in this matter. But we cannot afford to do it in this way. It must be done by this Association, and in doing it this way it will be holding up the hands of Professor Orton. I am surprised that we have not come to this before; that this school has been built up and we have only now taken this action. I think, under the circumstances, the quicker we put the resolutions through the better.

Mr. D. V. Purington: On the programme for to-morrow afternoon is the report of the Paving Brick Commission. It is a report which has received a great deal of labor and careful attention during almost two years since the committee was appointed. It will interest every member of this Association.

Mr. Eggers withdrew his motion.

The meeting then adjourned until Thursday morning.

FOURTH SESSION.

Thursday Morning, Feb. 4.

President Brush called the meeting to order at 10:15 o'clock and requested the Secretary to announce the first business in order.

Secretary Randall: We did not finish yesterday afternoon's programme. If we should begin where we left off we would take up the first of the questions for general discussion, under the heading of "Third Session." I would suggest, however, that, as we have a paper or two on the programme this morning, perhaps it would be well to skip the questions now and take up the papers, and then go back to the questions a little later.

Mr. Eggers: I move that the suggestion of the Secretary be adopted.

Carried.

Secretary Randall: The first paper is "Brickmaking, Old and New," by Brian J. Dunn, Bangor, Me. Mr. Dunn expected to be with us, but, I am sorry to say, he could not come; however, he has done the next best thing—he has sent his paper.

The Secretary read the paper, as follows:

BRICKMAKING—OLD AND NEW.

Mr. President and Gentlemen:

The Secretary's report of the first National Convention of Brick Manufacturers was as follows: "And they said one unto another, go to, let us make brick and burn them thoroughly." (Genesis, xi, 3.) There is not an industry in existence, or that ever was in existence, to the knowledge of man, with a history as wonderful as the history of brickmaking. Side by side with man, beginning with his earliest record—it is that record itself, in fact—in every land and in every century, there have been bricks and brickmakers. The first sign of man's awakened genius to create, to build, was expressed in the making of brick, and the record of his having lived is perpetuated in his handiwork. The earliest pathway of civilization is marked with milestones of brick; wherever civilization tarried long enough to make a kiln it has left its monument of brick. Semi-mythical tales of centuries-dead nations are substantiated by modern discoveries of city walls and structures of brick hidden from sight by the accumulations of time. From the grave of the most ancient civilization, out of the sands of the uninhabitable desert, are being unearthed columns and archways and walls of brick that were made and burned thoroughly, telling of men who lived and labored and loved, who were powerful and peaceable, surrounded by wealth and culture and grandeur out-rivaling the splendor of modern times; and this ages before our era began to feel the far-off thrill of the music of the spheres. Civilized man's monuments are everlastingly laid in bricks that were made and burned thoroughly. His less cultivated brother—bricks failing him—has left his imprint on the natural rocks or the trees in the shape of odd inscriptions and pictographs, but civilization's memorials are monuments made by hand. Wonderful is the history of brickmaking in point of antiquity; it is no less wonderful in the unvarying and universal practice of its methods in all climes and in every age down to the birth of the present century. To make bricks and burn them thoroughly suggested the same process six centuries ago (and more) that it did at the beginning of the present century, and it meant the same to the by-gone nations of Africa and Europe and America that it meant to the nations of the Christian era. The same rule, unvarying still, throughout the world: "Make good bricks and burn them well."

Some man, with less than the knowledge of the "straw" boss of a Spanish adobe plant, let loose a statement once that ancient brick were made of clay mixed with straw, and many intelligent people—and some brickmakers—accepted the statement as true. It is a favorite quotation of what is supposed to have been an ancient paradox, "The making of brick without straw." As a matter of fact, brick were never made with straw, though straw is necessary in the making of good adobe. The requisites for the making of good brick always were and will always be clay and water and fire, and brains sufficient to apply each to the other in the proper degree and in the proper time.

The first civilized man, as he woke up and reached for his overalls, said to his wife: "I will build me a strong house and defy my enemies. I have no tools to cut granite or slate, and it's slow work at best, and stone is not indestructible. But now there's mud, good mud, and plenty of it. I'll mix it thoroughly and make blocks of it; then I'll dry it and stack it and burn it into the hardest stone. Then, out of those clay blocks, I'll build me a house that will defy not only my human foes, but one that will resist the attacks of fire and frost, of drought and damp, of wind and water, of anything that time may assail it with—aye, and even defy old Time himself." And it did. And as the first man did, so did his descendants everywhere, until his nineteenth century sons developed a phenomenal bump of inventive genius.

With the ancients the making of the brick began with the preparation of the clay in the bank, and the first most critical stage in its evolution was reached in the tread—that which we modern brickmakers have more appropriately (according to our methods)

renamed the soak pit. The feet of man were the first pugging machines, and they performed that operation well. The world has never seen the pugging machine and soak pit combined that could equal the quality of the work performed by the human foot puger. The tread was the place in the old method where the most care was shown in the making process; next came the molding, and next the burning. For ages, then, the product of those who did "go to and make brick" emerged from the following simple process: Pugged by foot and molded by hand, dried by the sun and baked by fire. No straw about it.

And it is in the light of these many centuries of unchanged and unchanging methods of manufacture that the result of the past half century's progress stands out in such stupendous proportions.

Brickmaking, old and new—it is impossible to compare them; the mind halts when comparison is attempted. The old has existed for ages, and its monuments will exist while earth lasts. The new has been but a few years, yet it has accomplished more wonderful results than all the centuries of the old can show. There is the one simple, universal method, stretching back, unaltered and unchanged, into the mists of prehistoric times; there is the other, a wonderful collection of ever-moving, ever-changing forms and marvelous processes—nothing permanent, nothing the same, only in this: that there is in it the proof of the triumph of machinery over man, and apparently over nature. Those good old ways, which are nature's ways, of changing the characters of substances are not imitated by the new so faithfully as they were by the old. The old-time brickmaker is lost when he finds himself in contact with one of the modern brick plants, and the modern brickmaker scarcely dares utter an opinion outside of the shade of his own kiln shed. The spirit of change is over all; rush is the motto of all; make, sell and collect as quickly as possible is the modern brickmaker's rule of action; and he does it. How he does it is a source of wonder, even to himself. Sometimes he fails to do it, and then he wonders what it was that broke first.

Brickmaking has changed. It is no longer the trade that our forefathers followed. The change is trending from an outdoor occupation to an indoor science; from a dependence upon nature's offerings to a defiance of what she offers; from an industry dependent upon intellect and skill in every department to one dependent upon a medium-sized brain and an intelligent and rapid machine; from a stepping stone for ambitious toil to a passing occupation for hoboos; from a production of quality to an overproduction of quantity.

Brickmaking has changed from the thousands of small operations scattered far and wide, with all the benefits resulting from those thousands of independent business enterprises, to the concentration of the business in the hands of a few in localities close to the market, with all the losses to the communities, social and financial, which that condition implies. In this brickmaking only gives evidence that it is abreast of the times, and not behind the tendency of the day in all trades to concentrate and consolidate.

The machine has, in fact, conquered nature. The stubborn bull tongue of the prairie, the sticky quicksand clays of the bog and the rocky deposits which defied the brickmaker of old are crushed and beaten in the jaws of machinery, and, while yet unsettled from the shaking up, are caught in the ponderous dies and stamped into smooth, square and beautiful looking blocks. The tread gave way to the pug mill, and the pug mill is rapidly becoming the one monopolist machine.

The machine has conquered man. The man is but an attendant of the machine. It forces him to action and asks of him but little thought, except to keep it oiled, and keep it fed, and keep it clear. The open yard has given way to the artificial drier, and all that remains to remind the old-timer that he is in a brickyard is the kiln, which, though not his dear old scooped-up, brick-mouthed, up-draft structure, is still a creature much resembling it; and it must be fired as the old kiln was; and it cannot burn bricks any better or do it any cheaper, all things considered, than the old kiln could.

The new brick is a marvelous product; there is an artistic grace in its face and outline, a delicacy, that the brick of old could seldom approach. But beauty is with brick as with man—often not more than skin deep. The defiance of nature's laws cannot pass without punishment. The new brick has been made rapidly. It came quickly from its natural bed to the machine, and from the machine it passed without delay to the kiln. It looks well, but there is in it inherent defects which the masons discover. Its sides are apt to bulge in burning, and unfit it for safe work in a wall; or its interior is laid in folds or laminations, like a ball of hard-baked pie crust, and it does not hold itself together as a safe architect would desire; or it has blisters on its surface, or it has variations of color which cannot be accounted for, and it is in many ways found short of the excellent qualities which endeared the old-fashioned brick to the heart of the builder. The further from nature's way—the old way—the tread and the hand mold—has been the making of the new brick, the more certain to be found some or all of these discrepancies.

The old brick had the beautifying marks of its human creator on it. It had a face that was clean and a constitution that was sound. There was a grain or fiber in its make-up hard to describe, but which masons and builders recognized. It seemed that its maker breathed into it, as he worked, the spirit of his own independence and honest ambition, for its soul spoke in the musical, ringing note which it gave forth as it was hurried from the kiln to the wall. It had a disposition which took kindly to mortar, and its undeviating devotion to the purposes for which it was designed has been proven by time. It conformed to nature and defies time, whereas the new brick is inclined to defy nature, and in so far as it does so it will fail to resist time. The old brick wall stands as the best exponent of the virtues of the old method. The most enviable reputation borne by bricks to-day in my section of the country, such as Philadelphia's celebrated face brick, was acquired under the old methods.

The old process, the tread with bare feet, has never been improved upon, never equaled; the hand molder has never been improved upon and never equaled in respect to the quality of the brick produced.

The pug mill, the treadle-power molder, the off-bearing truck, the horse-power pug mill and molder, the auger machine and the various semi-dry and dry press processes have each, in their turn, increased the quantity of the output at the expense of the quality, and this without decreasing the cost of production per thousand, as statistics will show.

What, then, has machinery done? It has, first of all, made it possible to keep pace with the marvelous progress of building.

It has tended to concentrate the brick business of wide territories into small localities.

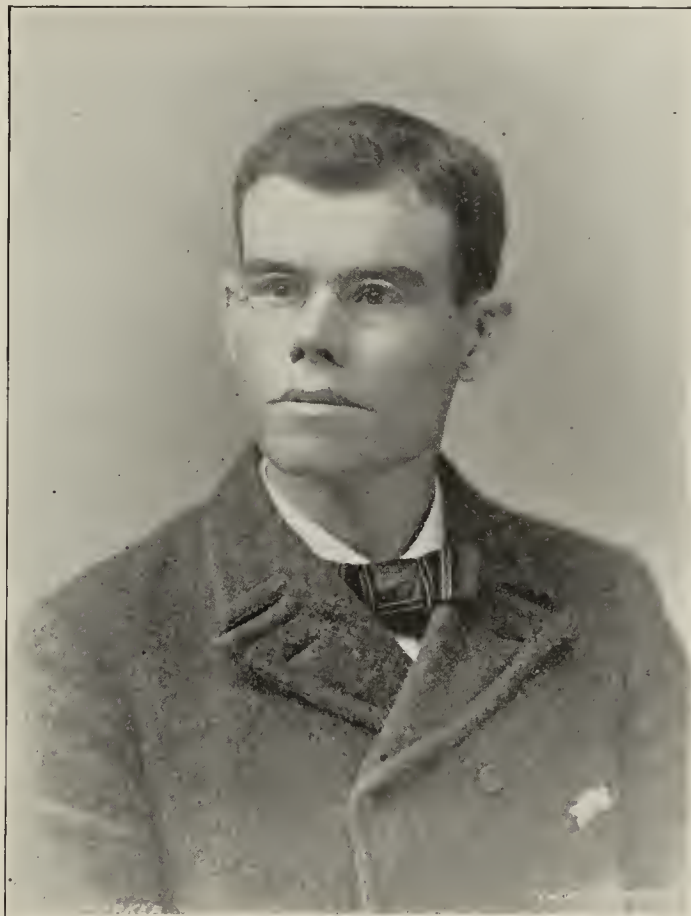
It has doubly quadrupled the brick-producing capacity of an acre of the earth's surface.

It has apparently defied nature's way of making brick.

It has made it possible to run a brickyard with one or two skilled men and a machine.

It has not lowered the cost of producing brick nor improved upon the quality of the brick, nor made the brick business a more safe calling, nor recompensed for the loss of independent skilled labor displaced by it.

But what's to be done? Simply get back to first principles. The old tread process must be more carefully imitated. The modern brick machine maker cannot afford to longer ignore the principles which time has proven to be good. The progress and history of nations are recorded in the brick and terra cotta work of their day. In that record the coming centuries will read the wonderfully rapid growth of our country and of the marvelous accom-



BRIAN J. DUNN, Bangor, Me.

plishments of science and art in these last-of-the-century days. They will note the lines which divided the old brickmaking from the new, denoting the wonderful effort (and the success of that effort) of the brickmakers to meet a sudden and enormous demand for their product.

Will they be able to note where the best principles of the old method are again adopted by the new—where the nineteenth-century brickmaker will have conscientiously said: "We made bricks and burnt them thoroughly?"

Time will tell. (Applause.)

President Brush: Are there any remarks to be made on Mr. Dunn's paper?

Mr. Morrison: I will not attempt to criticize a paper of this kind, but wish to correct a statement of our Secretary to the effect that the gentleman is liable to a fine for making this statement about burning brick thoroughly. Our Secretary is a little mixed in his geography and history. I do not mean to insinuate that the Secretary does not read his Bible every Sunday, nor do I intend to convey the idea that he does not say his prayers every night before he goes to bed. But when he

referred to Pharaoh and the children of Israel he laid himself open to a fine. The occurrence that he mentions is a thousand years beyond that time—forty centuries ago, after the great high water, a flood, I believe, larger than the oldest inhabitants have ever seen here on earth.

Mr. Pike: Brother Morrison is now subjecting himself to a fine of five dollars in criticising this paper. He has spoken about the making of brick by the children of Israel four thousand years ago.

Mr. Morrison: Allow me one moment. Four thousand years ago, on the plain of Shinar, the sons of Noah gathered together and held the first convention of brickmakers. They said to themselves: "Go to; let us make brick." They worked and laid down the principles of the art of brickmaking. That, gentlemen, is an honor to our craft—that four thousand years ago the principles of our craft were known.

Captain Crafts: I wish to amend one statement in that paper. The writer speaks of utilizing the hobo to make bricks. I do not think there is any way in which you can utilize a hobo except to make fertilizers of him. (Laughter.) I saw a picture where two of them were sleeping, and one of them woke up and cried: "Murder, murder! I had a horrible dream! I dreamt I was working!"

President Brush: We will pass on to the next order of business, gentlemen. Right here, before we go any further, it is desirable for our mutual good to know how many are going to take the trip with us to the Falls to-morrow.

Secretary Randall: I want to say that the local committee have gone to a great deal of trouble, to say nothing of the expense, to arrange for a day's pleasure at Niagara Falls to-morrow, and they want every brickmaker to go that possibly can. The trip not only includes a visit to all the points of interest about the Falls, under the guidance of the local people, but includes a dinner after we get there, and a very enjoyable social time, I know. If there are any members here who have friends with them they will be welcome. I hope you will get your tickets this noon. The local programmes will give you all the necessary information.

The next on the programme is a paper by Mr. George F. Cotton on "Some of the Essentials to Success in Making and Marketing Paving Brick." Mr. Cotton is also detained at home by matters he could not control, but he has also done us the honor of sending his paper, which I will read if it is your pleasure.

The Secretary read the paper, as follows:

SOME OF THE ESSENTIALS TO SUCCESS IN MAKING AND MARKETING PAVING BRICK.

Mr. President and Gentlemen:

The subject assigned makes me feel timid, and yet I have no excuse, for interchange of thought and ideas is the great, beneficial part of our organization in the manufacture of paving brick.

—Making.—

First—Find out whether you are fitted to make paving brick or not, in which not more than 25 per cent. of our craft are competent. If you are careless in one single instance, from the time the clay is taken from the bank until it is received by the inspector of pavements, or do not have good, horse sense, you are not the proper person to make paving brick.

Second—Have you clay or shale that will vitrify and hold its shape without mixing?

Third—Almost without exception, clay that will make good pavers should be run through the dry pan, elevated and passed into or over a good screen, so that when it reaches the pug mill it should not be coarser than bolted cornmeal. Then pug until every particle of the clay is moist. Conduct the clay in this condition into the stiff mud machine, and your brick are perfect.

Fourth—The brick, when taken from the machine, should not be marred in the least. Teach your men to take the brick up square and set them down square. The same process holds good in filling your kilns.

Fifth—Almost all clays make better brick if they are thoroughly dry when set in the kiln. This I consider as important. It saves time and fuel. Build good, closed, down-draft kilns, and set your brick best suited to your peculiar kind of clay—close or a little further apart, as the case may be—not to be set over thirty-one brick high. Bring your fires up gradually until your heat is sufficient to burn your clay. Then is the critical time. Do not hurry or allow your heat to get any higher, but hold. What is twenty-four hours of time when you want good pavers?

Sixth—When your brick are burned, close your kiln as near airtight as possible, and let it remain at least as long as you were in burning the kiln. Then your brick will not be brittle.

Follow these directions, and I am sure you will have some fine top pavers, of which number you should have at least one million on hand.

—Marketing.—

We will now don our silk hat and gold-headed cane and go to contract pavers for twenty blocks on O street.

When you go to the kiln to get a sample do not call your men together and have them look the whole stock over to find the very best brick in the kiln. Just take one hardly the average for the sample. Take this brick to the committee on pavements and tell them that this is a fair sample.

The committee are pleased with the brick, and conclude to use them.

Now comes the danger. They want three millions in sixty days. You have one million on hand. If you have no bad luck you can make the two millions in that time, as the full capacity of the plant is one million per month. So you sign the contract and go to the works, and everything has to hum. You crowd everything. Your boiler springs a leak, your machine gets out of order by being overworked; so you try and make it up in burning. You hurry your fires, spoil some, while others are not burned.

The first million were accepted, the last rejected, and you had to hustle to come out even on your large contract.

Next time let us only contract for two of the three million.

Second—Make it your rule never to deliver or ship any brick that are not thoroughly vitrified for tops. I hear some one say, "What are such brick worth?"

My answer is: We should never deliver such brick in our city or on car at our yard for less than \$7.50 per thousand. If our neighbor cuts the price, let him make all the brick. He will not run the next season for want of funds.

As I look over this audience I see nearly all of you, experts in the working of clay, and some may say, "How simple are these ideas," and yet I venture to make the assertion that if every one of us will put these rules in our office and read them every morning just before 7 o'clock it would be some benefit to our success in making and marketing paving brick.

Having built some of the largest plants in the West in the last twenty-five years, this has been my actual experience. (Applause.)

President Brush: If there are no remarks on this paper, we will proceed to the next business.

Secretary Randall: The next business will be the questions for general discussion set down for Wednesday afternoon.

FIRE-PROOFING — GENERAL DISCUSSION.

Mr. Gates: Yesterday morning we discussed a question which hit me a little closer, perhaps, than some others. This Association has met for the eleventh time, and, so far as I can remember, has never made a mistake—we have made incidental mistakes, but we have not made a real serious mistake which has put us in the wrong light with the public. I did fear yesterday that we were on the verge of making that kind of a mistake in being wrongly understood in what we said. I will read from a slip in one of last night's papers a report of our meeting yesterday morning. It reads this way:

"Mr. Henry R. Griffin, of Phoenixville, Pa., read a paper on clay in architecture, in which he explained the relationship of the brickmaker to the architect, and urged all brickmakers to help the architects by bringing their brick wares to them, so that the buildings will be modeled and constructed with greater intelligence. The hollow enamel brick, he said, was the coming ware. A discussion of this paper was then entered into by Messrs. Gates and Purington, of Chicago. The latter contended that there was no such thing as a real fire proof clay. He said that he had yet been unable to find a clay that, being subjected to great heat and then being doused with water, would not go to pieces. Mr. Gates urged that clay was fire proof. He said a great deal depended upon how the bricks were put up. Architects, as a rule, he said, know very little about bricks, and he believed Mr. Purington had been consulting some such authorities."

Now, the question at issue was, as I take it, more particularly a question of hollow fire-proofing for the interior of buildings. I apprehend, although I may be mistaken, that the tests Mr. Purington had reference to were of this character.

Mr. Purington: They were, all of them.

Mr. Gates: And yet the casual observer, picking up the paper, will say that this Association has said that brick would not stand fire and water, and we all know that is not what we have done. You have seen kilns that were fired up, in which a nine-inch brick was at a white heat on one end and you could walk on the other end of it. Now, if there is any other material on earth that will stand that test, I am at a loss to know what it is.

Mr. Purington: I want to say that I had reference entirely and solely to fire-proofing material as used on the interior of

buildings. While, perhaps, I made that statement a little radical, or was a little radical in making the statement, because I believe it is a part of the clayworking art that has been neglected somewhat in the past, I would like to have it understood that the material that will stand fire and water, if there be such material—and I am satisfied there is—is the material that should be used in buildings, and not that which is worthless.

Mr. Fiske: It seems to me this is a pretty serious matter, and if we do not look out we shall make some mistakes. I want to bear out Mr. Gates's idea in regard to this matter. Mr. Gates has expressed the fear that this would go out as applying to brick. This is not only a Brick Manufacturers' Association, but it includes those who manufacture and have large interests in other kinds of clay goods, and not a small part of that is fire-proofing—the hollow bricks and tiles for fire-proofing buildings constructed of iron. There is to-day a very strong competition with fire-proofing brick ware on the part of manufacturers of cement. Now, there is nothing that the cement people would like so well as to get hold of just such a point as that. They would make a great amount of capital of it, and say: "Why, the clay men themselves confess they have not a fire-proofing material," and we ought to remember that these things are liable to go out and other people get hold of them. I make the motion that Mr. Purington be requested to revise what he said yesterday in such way that it shall not reflect upon any fire clay material. I know that it will be, in its present form, a club in the hands of competitors of legitimate fire-proofing, and they will use it against us. I hope the matter will be looked over by Mr. Purington.

Mr. Batley: The argument of Mr. Purington and what he wished to draw out from the fire-proof manufacturers, which was not clearly got at yesterday, was, Is there a clay which will make fire-proofing that will stand both fire and water? I say, gentlemen, that there is. There is no need to go beyond Pennsylvania and West Virginia, the vast districts where coke is made, to prove it. Any producer of fire clay knows that the coke furnaces are charged full of bituminous coal, and the coke is burned from seventy-two to seventy-eight hours. The moment the coke has got through its burning, or in a short period afterwards, when it is all aglow, cold water is poured into the furnace from a five-inch pipe. It does not matter how cold the water is. I have made fire brick, and I know bricks in such furnaces will stand for eighteen months. If such a material as fire clay will stand that kind of rough usage, it is quite manifest that it will stand under any other condition.

Mr. Gates: The only fear I have had in this matter was that one little part of this thing would be published as the consensus of opinion of this meeting, and that is my purpose in bringing this question up here. I am talking about some one else's business on this interior fire-proofing. I am liable to misunderstanding on one other point which was touched on in this paper—as to the men I get my business from, the architects. I have never told you, gentlemen, that architects did not understand their business. I shall never do that until after I retire from business. (Laughter.) Now, there is one thing I do say right here—that you and I, as business men who are manufacturing an article and understand the requirements of that article, know that it is our duty to go to these architects when we see something in their plans which we think is inconsistent with our ideas and talk with them in a reasonable manner, and try to get them to adapt our material to its best use.

Captain Crafts: I would like to get in some way or shape a resolution of this kind: "Resolved, That the National Brick Manufacturers' Association expresses its approval of and unbounded confidence in clay as a fire-proofing material."

President Brush: That will go to the Committee on Resolutions.

Secretary Randall: It is the fear that the statement made here yesterday will be misunderstood which Mr. Gates is trying to overcome. Mr. Fiske answered that question fully, and if the reporters had heeded what he said there need to have

been no mistake made. There is no question of the fire-proofing value of the clays he spoke of. Unfortunately, the reporters took the item which would be used separately and distinctly from what followed, and in that way did the fire-proofing industry an injustice.

I want to suggest now that instead of taking up the programme where we left off we take another departure and listen to Professor Orton's report of the Commission on "Standard Specifications and Methods of Testing Paving Bricks." This paper is on the programme for this afternoon. I make this suggestion for the reason that it is desirable to have this Convention know more of what Professor Orton and his commission have been doing in the way of scientific work in the interest of this Association. When it is understood and known by the members of this Convention, the nature of his work and the results we are going to achieve by it, there will not be any hesitancy in indorsing the resolutions bearing on the further support and assistance to that commission. I think it would be timely to have his report read at this time, so that between this session and the next the members can get information as to what it is proposed to do in regard to this commission.



GEO. F. COTTON, Table Rock, Neb.

Prof. Orton: The Secretary has not made it quite clear to you what has been proposed and voted on for me to present at this time. I have a voluminous report in regard to this question of paving brick, but unfortunately some part of it has not yet arrived. There is no doubt it will be here in time to report in the regular order this afternoon. I have another matter here which is incidental to the main report, and which the commission, in its wisdom, has decided ought not to form a part of the matter for record. This subject is an offshoot or side issue of that. It is one which I am personally interested in, and which I was authorized to pursue by the commission, but, after all, it is an excrescence on the regular body of our report. For that reason I was asked by the commission to report it separately as my own work, and not theirs, and for that reason I will bring it forward at this time.

Professor Orton then read the paper, which was illustrated by a large diagram, which, with the tables referred to in his

report, will be given in a subsequent issue of the Clay-Worker, neither being in a shape to be reproduced at present.

AN INVESTIGATION OF THE EFFECT OF STRUCTURE ON THE WEARING POWER OF PAVING BRICK.

Mr. President and Gentlemen of the Association—In 1892 it was my fortune to conduct a series of experiments on the general properties of paving brick for the Ohio Geological Survey. I say experiments, though that is hardly the proper term to apply to the work which I did. My investigation consisted at that time of obtaining samples, selected in each case by the manufacturer, from some forty-five paving brick plants in the limits of Ohio. These samples were assembled at Columbus and tested by abrasion, absorption and crushing. The samples being selected by the manufacturers, and coming from plants which used clays of all descriptions, from the alluvial clays of the Ohio river up to the shales and fire clays of the coal measures of Ohio, naturally gave a very wide range of qualities, owing to the great diversity of material used. Not only did variations in character come from this cause, but also from the differences in structure due to methods of manufacture, and similar differences of vitrification due to varying conditions of burning and cooling.

Under these circumstances it was, of course, impossible to draw accurate conclusions as to the effect of any particular type of machine and well-nigh impossible to draw even broad conclusions as to one type against another type. A careful review of all the data obtained in making this test showed that side cut brick had a higher average in wearing power than end cut brick. Eliminating, so far as the nature of the samples made it possible to do so, differences in machinery and kinds of clay used, comparisons between shale end cut brick and shale side cut brick showed a slight difference in favor of the latter.

Also, the subject of repressing was considered in this same connection, and an attempt was made to find out the effect of repressing by considering the general average of all repressed brick against all plain brick, and also in several specific instances comparisons were made between repressed brick and plain brick of the same manufacture. In this test the advantage seemed to lie with the repressed brick.

Prof. H. A. Wheeler, of St. Louis, has assured me that he has recently gone carefully over the data of my test, and, while he was unwilling to believe the conclusions which I there deduced, he was still unable to dispute that all the evidence pointed that way. The unsatisfactory nature of this test, however, has left me, ever since its completion, with a desire to probe the matter to the bottom.

In July, 1895, the commission on paving brick tests of the National Brick Manufacturers' Association authorized me to begin a series of tests looking towards the solution of this question. A very partial and incomplete verbal report was made at Atlanta in December, 1895. Since that time the work has been pushed along with what speed was possible, and I have now ready the results of the first investigation of this sort in which the conditions of variations have been practically eliminated, and in which a real comparison is possible.

THE SAMPLE OF CLAY.

The sample of clay which was used in making this structure test consisted of about ten tons of shale material, which was ground by dry pan, screened, and run into a pile on the floor. This material was then shoveled over several times so as to mix the earlier and later portions of the charge. When it was considered to be homogeneous it was then tempered into pug-mill and packed as fast as tempered into barrels, of which some sixty were filled. Three barrels of this standard sample of clay were sent to ten different manufacturing establishments, all of them makers of paving brick or manufacturers of paving brick machinery.

THE MANUFACTURE OF THE BRICKS.

With the sample a specific set of directions was sent, asking each one to unpack the clay, retemper with as little water as possible, put it into their brick machinery, the nature of which was specific in each separate case, and make the whole amount into brick without admixture of any other clay material. The first third of the brick which came from the machinery were directed to be rejected, and the samples for future work were selected from the middle and rear portions of the charge, hoping by this means to absolutely avoid intermixture with such clays as the machinery had been working previous to its use in this test. The bricks on issuing from the machine were then directed to be dried on floors without the aid of artificial heat, so that the greatest uniformity in drying could be attained. When dry the samples were packed in sawdust and sent back to the factory which made the original sample of clay.

THE BURNING OF THE SAMPLES.

The execution of this work being intrusted to so many different men and under such a variety of working conditions naturally took some time, but after some months the brick made by these different machines had been assembled at the original point. There they were marked and set in a kiln in a compact body, as nearly as possible in the same course and at the same distance from the wickets or fire holes, so that air checking or any imperfections of burning which one brick might happen to meet would probably be shared by the other portions of the series. This kiln was fired as usual, and in due time its contents were drawn and the sample brick were then packed in boxes divided into two lots, part of them being sent to Mr. F. F. Harrington, in St. Louis, for testing by cross

breaking and crushing, while the majority, or possibly four-fifths, of the series was forwarded to me.

THE TESTING OF SAMPLES.

After checking up the numbers and identification marks of these bricks they were divided into charges of five each. Some of the makes of brick were represented by only a few samples, owing to misunderstandings on the part of the maker, while others were represented by forty or fifty brick. The standard charge of five test brick was then made up in volume to 10 per cent. of the cubic contents of the rattler by addition of eight Canton standard paving brick, selected from my standard pile in the laboratory. The first series of charges was then subjected to the abrasion test, being weighed after both 1,000 and 2,000 revolutions at standard speed and in a standard barrel. When this series had been completed as many of the different makes as were represented by enough brick to make a second set of charges were then carried through in similar manner, using Canton standard brick to fill up whatever vacancy in the 10 per cent. volume was demanded. A third series of tests was then made, using the remnants of the different makes of test brick which were left, and in most cases so adjusting the charges that end cut and side cut brick made from the same kind of machine were pitted against each other in the same charge and no Canton brick were required to fill up these charges to the required volume. After completing the abrasion test on all of the samples which were forwarded to me the results were collated and put in tabulated form.

A careful study of this table reveals some results which I think will be of great value to the paving brick industry, and which are doubtless as much of a surprise to many paving brickmakers as they have been to me. The conclusions which have been described in the early portions of this paper, as drawn from the Ohio survey test, are completely overthrown by the results of this series, and since in this series every condition of manufacture in which variation could exist has been rendered almost absolutely uniform, for not only was the clay perfectly homogeneous, but also the pugging was in most cases done by the same machine and the clay was used before drying out. The drying in natural air without heat was certainly nearly uniform. The burning and cooling were absolutely fair and impartial, and the testing, it goes without saying, was equally so. In fact, until all the results were collated no one had any idea as to what conclusions would be drawn from the test. The only element of variation which has been allowed to enter into the series was that which was purposely made irregular, being the kind of machine which was used in manufacturing the brick.

THE CONCRETE RESULTS.

In the succeeding chart I have shown graphically the results of the study of the tabulated loss in the table above. The very marked superiority of end cut brick over side cut brick is a surprise to me, and the equally plain advantage of repressing end cut brick and the equally plain disadvantage of repressing side cut brick cannot be mistaken by the most casual observer.

Now that the facts are obtained it seems easy to account for this fact. In the first case the line of pressure is at right angles to the lines of structure or lamination of the brick, while in side cut brick the line of flow of the particles and the line of pressure in the repressed die are parallel, consequently the slight change in volume which occurs in repressing operates towards condensing the laminations of the end cut brick, while it operates toward opening up and increasing the laminations of the side cut brick. It will be noted in this table and chart no names or clues are given which will enable one manufacturer or brickmaker to compare his brick to the disadvantage of others who may have had material in the same test. Also, I can state that several of the more important machine manufacturers have bricks from both their side cut and end cut machinery represented in this series; hence it cannot be claimed or believed by any fair-minded person that the results of this test are meant to in any way prejudice one class of machinery or one class of makers against another. The whole object has been to ascertain the truth in a spirit in scientific inquiry, and the results are so conclusive and so strong that it would seem that this Association ought to find real financial profit from the work done.

I should greatly like to return official thanks to the various gentlemen who have been most helpful to me in prosecuting this series of tests, but at their own request I refrain from mentioning any names in the hope that the series of results here presented will carry the more weight for this reason.

President Brush: Remarks are in order.

GENERAL DISCUSSION.

Mr. Eggers: I observe that the end-cut repressed brick has the lowest percentage of loss, but when you get down to the side-cut plain and side-cut repressed, the side-cut repressed has the greater loss. How do you account for that?

Prof. Orton: Suppose this is an end-cut brick (showing sample brick), cut this way (cross the grain); its lines of lamination are concentric around the core and run in this direction (lengthwise) with the clay. You put it in the repress, it presses down, and you close the laminations together. Now take, for example, a side-cut brick, cut in the usual way, the laminations going this way (through the brick laterally), and press it in the die to put it in shape; the pressure and lines of lamination are parallel. The blank, when it goes into the re-

press die, is smaller than the die, or you could not get the blank into the die. The blank must be smaller, and therefore, when it expands under the pressure of the plunger to fill the die space, the particles flow outward and the laminations are opened instead of being closed.

Mr. Griffen: I understand these bricks are all made out of one clay. Now, would it be considered conclusive, because these facts are true of that clay, that they would be true of any and every clay?

Prof. Orton: This is simply an indication of the way the thing goes. You cannot settle anything from one test, but we know more about the subject now than before. This kind of work was encouraged at Atlanta. This is the result of the first conclusive work that we have done. It ought to be an example which the rest of you will follow. I should very much enjoy seeing half a dozen charts like this made by different members of this Association and brought here to overthrow my conclusions next year.

Mr. Griffen: I have not been understood. It is not with the idea of overthrowing anything. It was simply to elicit the facts. I am not interested in the brickmaking business at all, and do not pretend to know anything about it. I ask the question to bring out the fact as to whether it was conclusive in regard to other clays.

Mr. D. V. Purington: I simply want to say that I have been present as a member of the commission at its meetings, and all I know about this test Professor Orton has told you. He did not inform a single member of the commission, so far as I know, of the names of the parties interested in those tests, directly from which these conclusions were deduced.

Captain Crafts: I don't quite understand the rattler test. Was it a test made by tumbling these bricks ad libitum in a barrel, or was something else rolled with them?

Prof. Orton: The test is made by putting all the bricks loose into a cast-iron barrel and tumbling over and over, and the bricks wear themselves out by hitting each other and striking against the sides of the barrel.

Mr. Penfield: I ask, in the case of the second thousand-revolution test, if the 26 per cent. is what was lost in the two thousand revolutions, or if it is the sum of the first thousand added to the second thousand?

Prof. Orton: These long lines represent the aggregate wear in each case.

Mr. Eudaly: These two blocks represent two distinct tests, the first and second rattling of the same brick.

Prof. Orton: This is the first rattling up to that part. The second is represented by that. The lower parallelogram is the aggregate of the test; the same brick tested again. The longer one represents the sum total of the whole loss, and includes the upper amount.

Mr. Eudaly: I think the last suggestion Professor Orton made in response to our friend, Mr. Griffen, ought to be borne in mind, and acted upon by every one interested in this business: that this is the first test, and it is within the province of every manufacturer to prepare his clay at his own establishment, and make these tests for himself to see what his clay will do, with these different kinds of brick, on his own machines. This should be very satisfactory.

Mr. W. R. Cunningham: According to the statement of Professor Orton, in testing the bricks, the brick with less laminations will show less loss than one which has a greater amount of laminations, and we all know that some clays laminate much more than others. That partially answers the question of Mr. Griffen.

Mr. Chambers: The results of Mr. Orton's tests simply indicate a principle which governs brick made from this shale under these different treatments. We cannot conclude from that that the principle will hold good in all materials. To my mind it will hold good, but I think the Association should continue this same work on a little broader field, and establish

clearly whether the principle does hold good in all materials treated as he has treated this one batch of shale.

Mr. McDermot: I think, from a remark I heard from two different gentlemen, that they have not fully realized just what this means. It seems to me it is so clear when it is stated right that nobody will want to make any further experiments. This test has demonstrated that if you take a plastic material and squeeze it together it will make it better and it will stand a more severe rattling test. If you squeeze it in a manner that tears it apart it will make it weaker. I don't think any material which you make closer and unite it together will be weaker.

Captain Crafts: We have not had what we should call a soft-mud brick test, a brick which has no laminations, and if the less laminations the better it will stand, why, the soft mud brick ought to go up ahead.

Mr. J. H. Chambers: I take exception to Captain Crafts's



W. S. BOWEN, Tacoma, Wash.

statement that paying brick made of soft mud have no laminations; they do have laminations.

Captain Crafts: They ought not to.

Mr. J. H. Chambers: What they ought not to have and what they do have is a different thing. That is why I suggested that the test should be extended to cover a wider field.

Secretary Randall: Virtually we are not making paving bricks in this country by the soft mud process. There may be one or two exceptions. As a general thing, paving brick is made by the stiff clay process.

Mr. Eisenhart: A brick repressed would stand better in a rattler test than a brick not repressed. Is not that the general opinion prevailing among brickmakers? In regard to the soft mud brick, you say, comparatively speaking, there are few made in the country. That does not signify that it is not possible to make soft mud brick. Therefore I think you should test the soft mud brick.

Secretary Randall: In reply to the gentleman, I would say that if you look at the chart it shows that the side-cut unrepressed brick shows better than the repressed side-cut.

Mr. R. B. Morrison: I want to congratulate this Conven-

tion and compliment Professor Orton on that report. I have been a member of the Association since its organization, and I have never seen a report which was so full and convincing and absolutely clear as that is. It is a report to be proud of, and one of the first fruits of this Association. We are settling some facts and laying some foundation stones to be built on.

Mr. Penfield: I think Professor Orton has taken the proper broad-minded stand on this question. He said that the experiments he has conducted have had such and such results. It is a strong indication of the facts, but it would be hasty to say that it is final and conclusive. We ought to continue as Brother Chambers has said, making other tests in order that we may know the exact truth. It would be folly to take one kind of material, make a test, generalize it, and then put it out as information to extend to all kinds for all time as a standard, because the main point that Professor Orton has brought out is that the laminations in the clay account for the different results obtained. There are kinds of clay which, when forced out through a die, present practically no lamination, or very little, and if these brick were cut in a side-cut and treated exactly as we see here the result might be entirely different. It would indicate that an end-cut brick is a better brick than the side-cut. I refer to the tests reported. We all thought that for several years. It then drifted to the side-cut brick, and a great many of the most prominent manufacturers to-day would say that a side-cut is the best brick. Now, then, on account of the chart, it would be unwise to jump at the conclusion that they are all wrong; and the thing to do is to continue the investigation so that we may come to a final conclusion as to which is the most desirable brick.

Mr. Taylor: Professor Orton cannot all the time defend himself. He made the positive, clear, incisive statement that this was one test, and that it did not establish any universal rule; it is only one step.

Mr. J. H. Chambers: I do not think anything said is intended to reflect against Mr. Orton. The remarks are simply intended to encourage this Association, to help Professor Orton to continue the good work which has been started. I hope it will go on, and that we will get reliable data, as we have here so far as he has gone.

President Brush: I think the Convention understands that.

Prof. Orton: It is an easy matter for the members of the Association operating on the line which has been laid down, and in the light of these conclusions, to bring this matter to a focus, and it does not necessarily involve the expense which this test has cost. Now that you know this, each man can contrast the working of his clay for himself, and if he wants me to make the physical test after he has made the brick, I will do that for him. Each one of you, almost, has access to all the different kinds of machines, if you wish to take a little trouble and call upon your neighbors, and, if you are willing to make up your own samples, take five or ten barrels of clay and make a batch of brick out of it. Most of you have both end-cut and side-cut machines in the same plant. Make both kinds, or go to your neighbor and get him to do it for you, taking pains to keep the continuity of the sample undisturbed, and burn them together in your own kilns, and send the stuff to me, and in another year, without costing anything but the freight, we can have further data on this subject, which ought to cover a wide range to make the thing definite. As it is, this is only an indication, but I regard it as a strong one.

Mr. Batley: I move that we extend a rising vote of thanks to Professor Orton for his valuable paper, and that this discussion be closed. Carried.

President Brush: What is your further pleasure, gentlemen?

Secretary Randall: The next thing on the programme, taking up the questions for general discussion, is the first one under the heading of the "Third Session:"

IS IT MOST PROFITABLE TO DRY BRICK BEFORE OR AFTER THEY ARE SET IN THE KILN?

Mr. D. V. Purington: I suggest that no one discuss this

question unless he believes he can dry the brick better before they are set in the kiln than after they are put in the kiln.

Mr. Carson: Mr. Purington has reference mostly to stiff mud brick. Dry pressed brick are entirely different. There are some conditions under which dry pressed brick are better dried in the kiln. I have found in my own experience that drying dry pressed brick in a kiln gives a brighter and cleaner color. I am willing to concede that to dry dry-pressed brick in a drier is more economical; that is all right.

Mr. Purington: That is the question.

Mr. Carson: But there are two kinds of economy, and sometimes we have to take our bricks from the machine a considerable distance to get them to the drier; they are not arranged with the machine at the door of the drier. It is a hard matter to keep the bricks in perfect condition, and you all know that a dry pressed brick is a tender material, and if your tracks are not level you are going to destroy bricks, more or less, in the circuit between the machine and back to the kiln. Under some conditions it is better to dry dry-pressed brick in the drier than to dry them in the kiln.

Secretary Randall: The next question is:

SHOULD A BRICK PLANT BE SO CONSTRUCTED AS TO UTILIZE NATURAL HEAT FOR DRYING DURING THE SUMMER SEASON?

Mr. R. B. Morrison: I understand there is some difference of opinion about what is meant by that question. If it is necessary for me to explain it, I will do so. You say natural heat and sun heat. Suppose that clouds come over the sun; does not the drying process of the brick go on anyhow?

Captain Crafts: It only cuts off a small portion of the heat.

Mr. R. Penfield: It seems to me the question is one, like most others, which depends on circumstances. Take a man who has a small yard and can conveniently dry his brick outdoors. Fuel is high and he has good facilities for drying. He can dry brick for less money in the summer than any other season, unless he takes heat from kiln. Take a small yard making 25,000 bricks a day; they put the bricks in racks and dry them without fuel, so far as heat is concerned. If they ran driers through the summer where coal is \$3.25 a ton it would cost a lot of money to dry the brick. If Mr. Purington had to dry in summertime with outdoor racks he would have to buy a few farms to get a place to put the bricks in, as he makes 150,000 a day in each plant. It is a question of conditions, and most men figure it out for themselves.

Mr. Kimbell: I think the solution is simple. If a man has money enough to put up a brick plant to utilize heat from his kiln, he can do it; it all depends on a man's "pile."

Mr. R. B. Morrison: This refers to a plant where there is an artificial drier. It is better to put up an artificial drier; it is a good thing, in addition, to have a drier you could use in the summertime with natural heat. It is only put in to help somebody. A man might want, in summertime, to dispense with fuel and dry in racks. I dried last year two or three million bricks in this manner, and it did not cost me a cent. I felt so good over it that I wanted to bring it before the Convention, and thought it might suggest something along this line.

Captain Crafts: I built a drier, not one of those patent things, but a commonplace drier, in which I placed about half a mile of two-inch pipe, with racks overhead, and it was there for a number of years, and we used it, and the result of our experience, or stupidity, or whatever you may call it, is that we have taken down that drier and placed open-air racks in its stead.

Secretary Randall: These questions have been submitted in good faith. The Secretary has not fabricated them, but they have come in from practical brickmakers who seek information along these lines. The next on the programme is the question:

IS IT ADVISABLE TO COMBINE THE MANUFACTURE OF ROOFING TILE AND BRICK? CAN IT BE DONE WITHOUT MUCH EXTRA EXPENSE?

Mr. Batley: I am one of those bashful young men who are here to seek a little information in that direction. I have been

in the clay business thirty-five years, and I do not think I know it all, by any means. I may say that I have not had any experience in the United States in combining roofing tile with the manufacture of brick, but I wish to say that anybody who has worked in a brickyard in my country—England (I guess you can all tell by the way I drop my h's)—knows that no brickyard that had the clay for making good brick conducted its business without making roofing tile. During my travels, which have been extensive for the past five years, I have called on all the prominent clay manufacturers in the United States, from Maine to California. The roofing tile business has not been extended, in my judgment, in the United States as it should have been. As to whether it is profitable to combine the manufacture of roofing tile with brickmaking, I, for one, would suggest that in a small way it is. I do not mean to say that I would recommend every member of this Association to drift off into making roofing tile, because a great many clays which make good brick are unfit for making roofing tiles. My experience in the roofing tile business was limited to my years in England, and that experience taught me that no clay was so well adapted to making roofing tiles as a fat, strong clay. Our tiles made at that time were not as elaborate as some of the roofing tiles which are made in Germany, England and the United States at this time, but we did manufacture what was known as the Roman and Spanish tile. In some yards the tiles were burned directly with pressed common brick, but the majority of yards burned their roofing tiles in small down-draft kilns of about ten to fourteen feet in diameter. The kilns were built very low. Nearly all of the kiln could be utilized and produce good ware without burning out of shape. We ought to be prepared, when a buyer or a builder comes into our factory with an architect's plans, and he wants to build a house of brick or terra cotta, to say: "I want to furnish you the roof at the same time." Let us do away with the slate as much as we can, for it is inferior, many qualities of it; do away with the shingle, because it is combustible matter and easily burned. I think there is large room for the manufacture of roofing tile in connection with brickmaking.

Captain Crafts: It is our misfortune to manufacture brick by the pallet system, about forty thousand a day. We have a certain number of men for one place and a certain number of men for another place, and one or two extra men for sickness. I have tried to manufacture ornamental brick at the same time, and it is a sweet-scented chapter, if anybody wants to try it. I can only afford to make one kind of brick and keep the men at it. To attempt anything else you break up your routine.

Mr. Taylor: We have got to meet conditions. The conditions under which Brother Batley learned his business and where I learned mine were very much the same. There the old-fashioned heavy tile roofing, that would break down an ordinary American wall, was the rule, and nearly anything in the shape of a tile would go. But the manufacture of tiles, as developed in the United States to-day, is an art. It requires the highest skill, and your soft mud will not be in it. You have got to have something that won't twist, won't move, and that will stand an immense amount of wind and strain and transportation without phasing under it. I advise any man who does not know all about tile manufacturing to leave it out of his brickyard. I was talking with a gentleman connected with this Association last evening, and made a humble suggestion to him that he should increase the breadth of his product. He said: "Why, I make something like thirty or forty million of brick. I sell every brick that I can make. Any little interference with that, whatever I make in that little interference, would sink the profits on everything else in the yard." There is a gentleman on the floor of this hall that makes a tile that I have never seen excelled. I may have seen its equal, but never its superior, and I wish you would call on Mr. Harris to say a word or two.

Mr. Chas. T. Harris: Our works are at Alfred Center, N. Y. When your genial Secretary came to me with his persuasive

smile, and asked me to speak on this subject, I said "No, I would prefer to listen to the brickmakers," for two reasons. In the first place, I was a young manufacturer—that is, I have been manufacturing for only two years and I never have made any brick, so I could scarcely speak satisfactorily or understandingly on this question of the combination. I thought that some of the brick men who had experience in both lines would. I am willing, however, to say a few words in regard to it, as I think that is the way we all of us are profiting in this Association, each one contributing his own ideas. The question reads, "Is It Advisable to Combine the Manufacture of Roofing Tile and Brick?" I would say that "advisability" depended upon possibility, and possibility depended on profitability. It is simply a question, it seems to me, as to whether it can be done profitably; that is what we are all after. Now, the gentleman who preceded me spoke of his experience in the old country, touching upon the fact that there they could combine their tile and their brickmaking with profit; but he also said every clay that would make brick was not adapted to the manufacture of tiles. I think that would hold true in a large



JAS. TAYLOR, Port Monmouth, N. J.

percentage of cases in our own manufacture. I think that a great deal of clay which would make good brick would not make good tiles. (Applause.) I am inclined to think that clay which will make good tiles will make good brick, however. I would defer, of course, to those who have had more experience than I in that line. If you have a clay that will make good tiles, and you can combine it with the manufacture of brick, I see no objection to it, and do not see why it would not be advisable. I carry the argument a step further, however, and say that, pursuing the same line of argument made by my predecessor, we should supply the architect with everything he wanted in the line of clay manufactures, and carry it still further and combine terra cotta with it, and make brick and terra cotta and roofing tile, and supply the whole building for the architect. Why not? It is simply a question of adaptability of the clay and possibility of the pocketbook.

Mr. Eudaly: The last is very serious. (Laughter.)

Mr. Harris: That is where the whole question of advisability comes in. This is an age of aggregation. The apartment

store is crowding out the small store. Why should not the large manufacturer of brick and terra cotta and roofing tiles squeeze out the little fellow? I would have to go with the rest, but such are the experiences of life. So far as the question reads, I see no objection to the advisability of it, if it is possible or profitable. I think, if the average brick manufacturer went into the manufacturing of roofing tiles with the idea of increasing his emoluments, he might find himself in the condition of the boy's calf. If you were ever on a farm and undertook to lead a calf away from its mother, you know some of the difficulties involved. A boy was going up a road, with a rope around the neck of a calf, and left the mother behind. They came to a place where the bars were down, and the calf saw his father over in the pasture and broke away from the boy. The boy said: "Go it, you fool; when you get there you will find it is not your mother; there is no milk there." (Laughter.)

Mr. Fiske: Looking at this matter in a particular sense, I will say, in all my observation of clay work, I have never known of a factory which undertook to make everything in the clay line which architects required—and there are a number which have undertaken it—that has made a financial success of it.

Mr. Yates: Referring to Mr. Harris's remarks in regard to the roofing tile business being spread over the country, I think if I was in the roofing tile business I should encourage that. If they go in and try it as inexperienced men they will get enough of it. We have got down to a three-eighths-inch tile. I know this: that a man who goes into the roofing tile business must thoroughly understand it, and he must know what kind of material to put in a roofing tile. Brother Batley said strong plastic clays. That is true to a certain extent, but he must know when he gets the clay that it will stand true in shape in the kiln. If the clay contains more or less alkali, the minute he puts the heat to it to vitrify it he would find it a bunch of pulp. All the conditions are governed by special circumstances. If a man has the right material and understands the business, he may go into a general odd stuff line, and that has its advantages. You put bricks two-thirds the distance in the kiln up; you can put the roofing tile in the kiln and take the weight off the bottom course. For parties who anticipate going into this business, the first thing to consider is the expense; the next, material, and the next, conditions of the market, and whatever they decide upon doing, make a special feature of it, and bend their energies in that direction, and they may probably make a success.

Mr. Endaly: I know of two or three cases where it was tried and the clay was not suitable for making roofing tiles, and it proved to be a failure. The parties could make no success of it and abandoned it.

Mr. Gates: This is a question that may mean expense to many. I have spent a little money in that line. When I first started in the clay business my card read, "Manufacturer of common and pressed brick of all colors"—and there was a good deal of truth to that particular feature (laughter)—"ornamental terra cotta, pottery, fire-proofing," and if I went out in the line of trade and found there was something I had left off the card, I had a new set printed including that. My card reads to-day, "Architectural Terra Cotta," and you could not get me into anything else under any circumstances.

Captain Crafts: The greatest value of this Association is that we come here and tell each other what not to do.

Secretary Randall: The next question on the programme is:

CAN WHITEWASH BE PREVENTED FROM COMING ON THE SURFACE OF GREEN BRICK BY VARYING ITS TREATMENT IN A DRYING TUNNEL?

Mr. Merrick: I am a contractor as well as a brickmaker, and have found, in the fall of the year, with repressed brick, when they are placed in water and thoroughly watersmoked, that this whitewash comes out quite thickly during the winter and the next summer is nearly all gone. I lay that to a great

extent to the lime soaked up into the brick and coming out on the surface. There is lime in most all clays. I think the lime water soaks up into the clay and comes out on the surface.

Captain Crafts: Wherever in the East we have used red mortar we find more trouble than with white. There will be no efflorescence on white mortar laid in the summer, and there will be in red mortar.

Secretary Randall: One of the things the investigating committee is going to take up is to analyze this efflorescence, and give us a report on efflorescence similar to the one on paving brick.

Mr. Grant Dibert: In our city we notice that when the brick is laid with red mortar we get the whitewash, and the architects have a great deal of trouble and object to a great many brick on that account. The efflorescence is quite decided.

Captain Crafts: By efflorescence you do not mean what we call whitewash. That is different.

Mr. Dibert: I mean the white that comes out on the brick after they are laid. More white comes out when laid with red mortar than with white mortar.

Prof. Orton: Gentlemen, it seems to me that this subject of efflorescence is one which needs a pretty thorough going over before we can get to the bottom of it. At the present time I know of at least four different causes which will lead to the efflorescence, and I expect there are others. Those I have hold of are partly the results of experiments made by others and partly what I have seen. The next question on the programme is this: "Is Efflorescence on a Brick Wall Ever Due to the Kind of Mortar Used?" I can answer positively that in some cases it is due to that. An analysis or examination of efflorescences, either those on the brick dry, or those on the brick unburnt, or those which come out in the brick in the yard after burning, or on the wall after they are laid—an examination of any of them will generally show that the material is rich in sulphuric oxide, generally the soluble; sulphates and the bases we have made of lime, magnesia or alkalis, and generally a mixture of all.

As to the point that red mortar is a prolific cause of this, red mortar is generally stained with oxide of iron, and oxide of iron, in its richest and best coloring form, is made by roasting copperas and sulphate of iron, and as I have tried lately to make some, I know there is 2 or 3 per cent. of sulphuric acid left on the iron, and when it goes into the wall it is absorbed by the brick and sweats out on the surface. The red oxides of iron, made by igniting copperas, are of the highest coloring power, and, for that reason, often misused.

Mr. Morley: Professor, did you ever take notice that it shows quicker on a brick laid wet than a brick laid dry?

Prof. Orton: Yes; these materials which come out on the surface of the brick are taken in solution with the water which they have, and the more water the more chance of the material coming in solution and interfering.

Mr. Morley: I am also in the bricklaying business, and when we have a big rain and take the top course and lay it on the wall, when it dries out in the summertime the white stuff is on the brick.

Mr. Taylor: As we were driving around yesterday I called the attention of those in the sleigh with me to a red brick building which we passed, which had three distinct horizontal stripes, extending from three to six courses, which were badly discolored with this efflorescence. I referred to that in order to illustrate a theory which has been in my mind as the result of my observation for several years past: that this efflorescence is due to an excessive moisture getting into the wall. It is very clear to my mind that, in the erection of that building, at three times the work was suspended by reason of rain, and, instead of taking off the two or three top courses after the rain, as is done by some particular builders, they set to work right where they left off, and the excess of water from the rain had dissolved or made soluble these sulphates, or whatever it may be proved to be, the soluble salts, and left them there.

While I am up I want to call attention of the contractors and brickmakers on this floor to an examination of this question, and suggest that the next time you come to a building which shows any sign of efflorescence after being built a year or two, just look and see if your practical knowledge as a builder does not show you conclusively that the construction is such that a larger proportion of water comes down in that place than any other place on the building. I venture to say that every time you can find efflorescence on a building a few months after its construction, if you will make an examination you will find it is due to a fault in construction.

Captain Crafts: In New Haven, in dry weather, the masons soak their brick in order that the mortar shall not set too quickly.

Secretary Randall: The next in order is the question:

WHEN, IF EVER, IS THE "NO ADMITTANCE" TO BRICK WORKS ADVISABLE?

Mr. Kimbell: I extend an invitation to every brick manufacturer, when he comes to Chicago, to visit the works of the Chicago Hydraulic Pressed Brick Company. We do not have the sign "No Admittance" on our doors except when there is a strike, and if there is a strike we propose to say who shall come in and who shall not. But in times of peace I want every brickmaker to recollect that the latchstring hangs out, and there is always a hearty welcome inside. (Applause.)

Captain Crafts: I think "No Admittance" is proper when a man is ashamed of the brick he makes.

On motion the Convention adjourned until 2:30 p. m.

FIFTH SESSION.

Thursday Afternoon, Feb. 4.

The President called the meeting to order at 3 o'clock.

President Brush: What is the first business before the meeting?

Secretary Randall: Professor Reis, of New York, who gave us a very interesting paper, as you will remember, has some reports here from the statistical end of our government at Washington. Mr. Day, who has charge of the department, has a very kindly feeling for the clayworkers. He has been working for several years to improve the character of his reports pertaining to the statistics of the clayworking industries. Prof. Reis has the report, and would like to say a word in connection with it.

BRICK STATISTICS.

Prof. Reis: I want to take up your time for only a moment. I suppose you have annually received these little statistical blanks to fill out, and most of you have filled them out and returned them promptly, for which we are grateful. I hope those who have not sent them will reform in the future. These statistics which we receive in the United States Geological Survey are treated entirely confidential, of course, and are used to make up the tables of the productions in the different mineral industries in clay, coal, iron and other substances for each State. Dr. Day has sent on a number of copies of the last annual report of his office for distribution among the members. The reports on clay are compiled by Mr. Middleton, the Statistician of our office. I trust you will take one and look over it. There are some interesting points about the report. For instance, in spite of the depression in the clayworking industries, the revenue from the different clay products in 1895 amounted to \$65,000,000. This probably does not represent the entire amount. It would, perhaps, be \$80,000,000, but the returns received amounted to \$65,000,000, as compared with \$64,000,000 in 1894. Of the States producing clay manufactures, Ohio takes the lead, Illinois second, Pennsylvania third, New York fourth. In 1894 Illinois was third, but in 1895 she jumped to second place. You will notice the tables are given by States for the various materials. There is also given in another table the average per cent. of the total product of each

State, and still another gives the average selling price in each State. The highest price for brick was in Idaho—\$8.40—the lowest in South Carolina—\$4.29. Then there are a number of other tables equally interesting. (Applause.)

Mr. Bloomfield: If there is no motion before the house, I wish to touch upon the remarks of Mr. Purington, following the paper on "Clay in Architecture," with reference to the want of the fire-proofing quality in so-called fire-proof blocks. I am exceedingly jealous of the fire brick and general clay interests, and it would be decidedly opposed to the interests of all those handling clay in any shape to have it get abroad that we for a moment doubted the fact that buildings could be made fire-proof by the use of fire clay. I have been present on two occasions at two large fires in New York. Fifteen years ago the old World Building was burned down. Opposite to it, on Nassau street, was, I believe, the first fire-proof building erected in New York, known as the Morse Building, the front of which, entirely free from iron, was brick and terra cotta. The fire was so rapid and intense that a number of lives were lost. Notwithstanding that every pane of glass and the sash



S. S. KIMBELL, Chicago, Ill.

work were destroyed, the front of that building was not injured. The brick and terra cotta are there to-day, and were there through all that fire, which shows that fire-proofing does have a beneficial effect. If it had not been for that the Morse Building would have gone down. Three years ago I was present at the burning of the building at the corner of Bleecker street and Broadway, another fire-proof building, so-called—the Manhattan Bank. That was built on a different basis, the front being stone, iron and brick. The heat warped the iron and the iron fell out of its place and allowed the flames, which originated in a building on the opposite corner, to get into the so-called fire-proof building, simply on account of the iron. I believe a fire-proofing material can be made with a low grade clay on which water will have no effect, even if heated to a white heat.

I think it is right to speak of this thing so that those who are using other material for building purposes should not be given an argument to use against us, and more especially when we consider that the brick interests of this country, according

to the report given to me at the Smithsonian Institute, about three years ago, at Washington, are more than double those considered to be the greatest in the United States—the iron industry.

Mr. Purington: This is not the first time my statements at these Conventions have been misunderstood. I think, when you read the report of what was actually said, you will find it was intended to convey the idea—not that clay was not fire-proof in and of itself—that so far I had not seen a fire-proofing material that would stand being heated to an exceedingly high degree of heat and would then stand a volume of cold water being poured upon it. In these tests made in Chicago they were not confined to clay materials; there is a composition material of plaster paris and lime, which is very cheap and has been used a great deal in Chicago, that has only to be heated up to 200 degrees and water poured on it and it becomes mush and goes to pieces. The same thing is true, at a little higher degree of heat, of a great many other fire-proofing materials. I desire only to call the attention of the clay-workers of this country to this subject, in order that they might be able to get at the best material from which to manufacture fire-proofing. I am glad that the question has been answered satisfactorily. I believe, from the statements made, that a low grade of fire clay, made by putting sawdust in it, becomes not only fire-proof, but will stand the test most satisfactorily that I asked for—that is, heating it to an intense degree of heat and pouring cold water on it. The members of this Association should think of this matter, because there is a large amount of so-called fire-proofing product made out of clay which is not worthy the name.

Captain Crafts: Last summer there was an explosion in Orange street of two cylinders of acetylene gas, killing two or three men. The building was as far from our place as from here to the hotel, and when I got there the flames were coming out from the windows and extending about twenty-five feet out into the street. I never saw anything like it before in my life. Until the acetylene was burned out water did no good. The front was intact, no harm being done except the injury which resulted from the placing of stone arches over the window, necessitating the taking down of the walls at that point.

President Brush: I would like to throw out an idea here. In most of these fires, in putting them out, they really create combustion by pouring water on a white-hot material. Many buildings are demolished by water gas in these destructive fires. Is not that so, Professor Orton?

Prof. Orton: It creates a water gas in the sense that steam is a gas, and not in the sense that is generally meant by that term. Water gas, properly so-called, is the gas which arises when steam is passed through a layer of white-hot carbon in some form, in which the gas or steam is broken up and forms a carbonic oxide on the one hand and hydrogen gas on the other, both members being highly inflammable and capable of creating a great heat again when they burn. I do not think it very often happens in the case of a fire in a building that you get the necessary conditions to make the real water gas. In order to decompose watery vapor you have got to pass the steam through a layer of white-hot carbon; red-hot carbon won't do; and it must be a layer, so that the gases will have more than one opportunity to decompose. I do not think the conditions often prevail in a burning building, but you do get the copious evolution of superheated steam.

Mr. Carson: Professor Orton brought up a question of much importance. He speaks of passing steam through hot clays to generate heat. Is there any economy in passing steam through a boiler fire to get a better heat? Would it be worth the trouble? Is it of any account?

Prof. Orton: It seems to me that the discussion is taking a phase which is not contemplated by our programme. I will say one word, however. It takes a good deal of heat to decompose steam into its component elements. The operation is not a heat-giving one, but a heat-consuming one. When these

elements are recombined later with oxygen, and burn, as they do, you only get back the most part of the heat used in producing the gas. There is absolutely no fuel economy in it, but there are advantages which may come in in the way of saving grate bars and carrying the heat a little further away from the fireplace.

Secretary Randall: The next subject is the paper by Mr. H. H. Fernald, of Boston, on "Success of Business as Affected by Geographical Conditions and Lack of Mutual Understanding." Mr. Fernald is not here, but he has done us the favor of sending his paper, which I have asked Mr. Sibley to read for him.

The paper was read by Treasurer Sibley, as follows:

SUCCESS IN BUSINESS AS AFFECTED BY GEOGRAPHICAL CONDITIONS AND LACK OF MUTUAL UNDERSTANDING.

Mr. President and Gentlemen:

Having been requested to furnish a paper on a topic of interest and benefit to our trade, I submit the following, it being my intention to show the effects of natural geographical conditions on customs and habits in different localities, and also the lack of mutual understanding as being the cause of many of our difficulties and losses, together with suggestions as to what might prove a partial remedy for our troubles.

I have endeavored to ascertain how much the temperaments and moods of business men have to do with their methods and success in business, also that such temperaments are constitutional. Localities are likewise affected; their customs and habits are natural to their conditions and climate, and their business habits are the expressions of their local conditions.

In New England, with its quaint and set customs, traditions and incomprehensible weather, our business habits and conditions are remarkably different from all other sections. The Hudson river is a natural dividing line between New England and other parts of the country. Politically, a line is drawn a few miles to the east. The country to the west and south of this great water highway yields naturally and abundantly immense quantities of mineral and agricultural products. Its mountains are filled with coal and iron; its lowlands with oil and natural gas; its fertile soil gives forth prolifically of about every important agricultural product; the hills and uncultivated lands furnish the finest grazing grounds in the world; its climate is even and productive—a land blessed by the hand of God.

Within this list is contained everything conducive to prosperity and happiness. Every item is the seed from which nations grow when put in the hands of men of industry and thrift. The increase of our cities and towns is the natural products of the soil. With this comes the knowledge of the desirability of location for the convenient and profitable conduct of business and a consequent demand for homes, factories, storehouses and office buildings. Such demand has taxed human ingenuity to provide profitably, conveniently and attractively, and the result is the immense and beautiful buildings that adorn the cities of the West. Nature has been kind in bestowing such blessings and gathering a people therein capable of using these blessings so wisely.

But now let us look at the corresponding picture in New England. Far be it, though, for me to admit that New England has not also been blessed; that she has not many things calculated for her glory, but so different. She has no mineral wealth. The area of her naturally productive soil is comparatively small. Her weather is too severe to permit of growing only the more hardy products. Her unreclaimed land is too stony or covered too compactly with the stunted undergrowth natural to severe weather, and the seasons for grazing are too short to make cattle or sheep raising profitable. We have no fuel except wood, and at present about all large seaport cities are provided with much of this from the British provinces.

From such conditions, I think, it will be allowed that wide differences exist between the previously named sections, as, with the exception of lumbering, fishing and quarrying, which are but an infinitesimal part of our business, we have hardly a native product that can be sold outside of our borders.

We are a manufacturing community, but all raw materials must be imported before we can start our wheels—coal for heat and power, iron for boilers, engines and machinery; also cotton, wool, hides and all other ingredients that enter into our products. Our towns and cities are the result of tireless activity and persistence, joined with a native ingenuity and tact. There is nothing that gathers around the base of our cities and crowds the comparatively low structures into lofty monuments of the country's riches; nothing that builds cities out of our towns or turns our farm property into factory sites but the unceasing devotion to business and constant search for greater and better methods for producing our wares and markets for the same. Here is the contrast between the West, made rich by nature's lavish bestowal of all which satisfies man's wants and desires, while the East maintains hers by the unrelenting use of human device and artifice.

As our country is dependent upon the success of our manufacturing industry, all minor enterprises are likewise thus dependent, and while the West and South, with their many different industries, may bound ahead by strides, New England can only move moderately and by steps. The convictions of a man who has labored for years, with restricted opportunities, before he has fully grasped a thorough knowledge of his subject make a last-

ing impression and are not easily effaced or supplanted. A younger man, having given him the cardinal truths for a base on which to build, comprehends the different phases of the problem, and, with such conception, changes the whole appearance and methods of the perfected principle, and all without having impaired the truths demonstrated by the older one as correct. Thus the primitive mode of brickmaking has been the basis for younger men, and present methods of the West the perfected methods of the pioneers. As schools are established to teach new and advanced ideas, so a country that is new invites and permits new and advanced methods. Some of the old schools of forty or fifty years ago would ridicule many of the essential points in training of the younger minds of to-day. Just so with brickmaking in the East. If factories for the manufacture of brick were established there before the West had demonstrated their radically advanced ideas correct they would have been marked as ridiculous. But the West has proven her ideas and gradually the East is accepting them. Such acceptance is, however, bound to be slow, and will not be complete until her market is changed, as well as her brickmakers. This change is prevented from being a rapid one by the fact that our market, for bricks especially, is much more limited than in the West. The reason for this is that our country is densely settled at all points where favorable conditions for manufacturing exist, and it is only by the building of larger markets for our goods that additions to our factories are required, or by the rebuilding of our old and inconvenient buildings into the structures that modern science and present demands require.

Our business is made; it is not the increase in the demand of our natural products. Our local markets for permanent needs and improvement are the results of extensions of sales of manufactured wares outside of New England. In our customs and methods relating to our locally consumed products, that have no sale outside the prescribed territory, we have no incentive to make radical changes, and the expense of same is not warranted by the prospective return. Thus changes are only wrought gradually, and New England gets the reputation of being abnormally conservative and antiquated. Again, machinery is used almost wholly in brickmaking by the most improved methods, and in New England there is a natural prejudice against machine brick when introduced to the consumer, and, although this is not so marked now, it still prevents the extended manufacture of the same. The above are conditions that affect our business. They are natural to the country, and it is only by changing them that a difference will be wrought in business methods or men.

Then there are conditions that are found in all sections that seriously impair profitable business, such being the result of misunderstanding, incapacity or avarice of many of those engaged. In our local markets there are two elements at work that prevent, in a large degree, the profitable manufacture of bricks, unless the same have earned a reputation. These elements are natural to all business similarly situated, and are due to their respective locations, one on the coast having water shipments, the other inland and shipping by rail. The first has advantages of cheap transportation and fuel; the other is more expensive, and permits the former to name needlessly low prices for goods that could command much higher ones, and they far undersell the goods made inland, that must exact higher prices or sell at a loss.

Another factor determining the price of brick is the capital backing the enterprise and the business capacity of the managers. Many yards are constantly worked with very limited amount of capital, which necessitates a constant turning of the goods to furnish money to continue with. Provided the market is fairly well stocked, these goods are sacrificed at ruinous prices to turn them into cash; thus their capital is constantly impaired, or at least seldom increased. Prices thus obtained, to a large degree, fix the market value of goods and prevent capable managers from a profitable disposal of their wares, or oblige them to keep same in stock until the others dispose of theirs, reducing the opportunity of profit by contracting the demand. This limits the desire for the stronger ones to continue or to enlist new capital or methods.

Another manner of cutting prices is by reducing the size of brick, which permits a great saving in kiln room and expense of burning same, and, in many cases being fully 10 per cent. smaller in size, the price can be cut amazingly, and as there are many poor buyers in the market who believe a brick is a brick, large or small, such prices are considered low, and they fail to see the difference in value of the different sizes.

A manufacturer is constantly met with these conditions and is prevented from selling large quantities of brick, whereas, were all bricks the same size, such conditions would not exist. It should be compulsory, as far as practical, to make all bricks of a standard size in the same manner as so many pounds constitute a bushel. Molds should be made with careful allowances for the different shrinkage in clays, assuring uniformity in size.

In these embarrassments, no doubt, all of you are confronted with similar difficulties, and it is fair to presume one of the objects of this organization is to eliminate such features, as far as possible, from future transactions. With the experience New England has had there will be no hesitancy in promising her support.

To the eradication of this all turn and ask, What is the most practical and certain means? and it seems natural to overcome the evil by some strong organization that will coerce the low-price dealers to raise the price, that would be profitable to those less favorably situated or those who have given the public better methods, better workmanship and better brick. In most cases the desire at its inception is honorable, and, it may be said, is in no wise injurious to the smaller or less favorably situated men; but by careful scrutiny of the methods that must be pursued to successfully accomplish this we must stop and turn back. This coercion is against the principles that have been inculcated in us

from childhood, namely, personal liberty, a restriction of individual enterprise, a centralization of power. If we look back in the world's history, there is the fall of Rome, the decline of Holland through her association with the Dutch East India Company, and other empires, organizations and trade associations whose only right was maintained by law or force. In order to continue these they were constantly required to resort to subterfuge, to control and support alien forces, which gradually grew so large and unwieldy that human skill or management was incapable of controlling them, and they fell by their own ponderousness. A monopoly honorably won and maintained is creditable, but from its nature it is bound to be corrupt, as well as injurious.

But to look further for this solution of better prices we must find the real cause for the existence of low ones. Our trouble is not altogether low prices, but it is the inability of those who take such prices to understand that they could get more. With this understanding, can we suppose that they would submit to such ridiculously low prices? Certainly not. Then it is a reasonable solution to assume that, instead of turning them away by measures of coercion, we should associate with them. We should get them to come together in a local organization, and by contact diffuse the ideas of supply and demand, as well as better methods of making brick or other clay products. They would be benefited by instruction and comparisons of cost, methods, wants, styles and designs required in each community, and by a general understanding. When all are equally informed their judgment will be sim-



GEO. T. HOWE, Leeds Junction, Me.

ilar. They would then understand how many brick to make, when to market them, what the average cost was and what would be the price of the body of them, and that their price need not be lower than what the high-cost goods must ask. It will be admitted that this cannot be accomplished in a season, but changes wrought too quickly are not lasting, and the power of force never accomplishes the same as the power of education.

In conducting business with many competitors there is engendered among them an animus that buds and blooms into individual animosity, and eventually works harm to all. Prejudice succeeds reason, honor is questioned, and individuals and products are decried. This soon affects and influences the consumer, and all are jumbled into an indiscriminate mass, each one using all the advantage he has or can create for the purpose of beating down what may be left of his competitor's reputation. This results in suspicion and general demoralization of business. But many say, "This has always been so, and will always so remain;" that to admit the equality of a competitor is to give an unwarranted advantage; that, to succeed, business must be conducted with a high hand. These are statements not based on facts. As a Scotch bard wished, "if the powers above would only give us eyes to see ourselves as others see us," we would perceive a pitiful picture, and that this principle was the basis of reckless competition. It would be like the legendary Kilkenny cats or the ancient proverb, "A house divided against itself will fall."

The essential quality in business is not antagonism, but to establish a high standard of goods and of business honor, and aggressiveness sufficient to maintain them, and thus raise the stand-

ard of all to this level, and not stoop to the low plane that all decay. Instead of animosity, there should be fellowship; in place of deceit, frankness; progress instead of retrogression.

The rapid progress in methods and styles in building has made the average mind skeptical. From such indecision many accept any method that promises to fulfill their wants. To the clay industry market this is working considerable injury, which could be greatly lessened by the manufacturers meeting in local organizations. They should search out all new styles, study the features of same, have same discussed at their meetings, and, if there be advantages, ascertain in what way such advantages could be incorporated in their product. Do not, by seeming indifference, let these systems get so firm a hold before investigating them, and thereby cause such an unevenness in demand. This is a matter that should be followed very closely, as the well-deserved reputation of clay goods can only be maintained by meeting the demand and fulfilling all the requirements. In this statement I particularly refer to fire-proofing, although I believe the same may be considered in its broad sense. This material is daily being encroached upon by methods and materials totally unfit for the purpose for which they are used. While some may contain one or more factors desired, none contain all, and all are especially lacking in those qualities most essential for fire-proofing. In this branch of the building business the remarkable superiority of clay goods has been generally and conclusively demonstrated. On this demonstration architects and engineers have established a base of cost, strength, durability and design.

The imitators pilfer the rudiments of construction and build on them a substitute that shall be cheaper, and with this plea deceive the market. If the price was higher would they do so? If they were more expensive would they be used? Have any of them a single quality superior to terra cotta, or a quality that would commend them at the same price as terra cotta? Not one. Cheapness is their passport. How can they be cheaper than terra cotta? Simply by omitting qualities that make terra cotta superior; by designs which terra cotta supplanted and perfected, and by materials and workmanship used and furnished only because cheap. Eternal vigilance is the price of success as well as liberty.

Yet we have another factor that is to be carefully guarded in order to make secure and increase our business. This factor is the architect. With him we must do a great portion of our business, and, when deserving, he should be helped in every honorable way. He should be given the benefits of the best wares of our several kinds, as well as courteous and liberal treatment. We should also sustain him in all his business transactions consistent with fair and just treatment to others. With those of this profession whose methods are questionable or unprincipled our sense of prudence should be as carefully used. These parties, in a market, are soon known, and when figures are requested, ideas sought or favors solicited, they should be given with utmost care and discretion, as they seek advantages early and profit by our injury and loss. Fortunately, this class of architects are not in the majority, but they are capable of performing more injury than their more honorable brothers can overcome, if advantages are given them.

I have one more topic that is of vital importance to the success of any business, and especially so in building material. This is credits. While the other elements before mentioned are of importance in establishing a business, credit is the important one in maintaining same. Ordinary business credits always require thought and investigation. Conclusions to same are arrived at from a thousand and one sources, but I wish to draw attention to one that is a menace to the furnishers of building material.

In all large cities, where business draws many people, there are classes whose credulity, ignorance or knavishness lead them into business projects for which they are unfitted in capacity, financial ability or honesty. They, like cheap methods, have one or more of these qualities, but for many reasons have not all. In building this is particularly noticeable, because their ventures are so large and the material furnishers are the principal and nearly the sole sufferers.

As is well known, around large cities the body of unimproved land is mostly absorbed by land speculators, who are keen, pushing and beguiling. Appreciating the value of this land when improved to the extent the nature of the location will allow, they comprehend the manner of gaining this improvement without cost, but with full benefits to themselves.

For the instruction of those fortunate enough to have avoided this evil in the past, it is worth the time to describe the methods by which such gigantic frauds are perpetrated. These speculators usually gather mechanics around them whom they judge capable of completing the work, or else bringing it to such a stage that it is profitable for them to complete it themselves. They lure these mechanics into the belief that the land is worth, in its present condition, as much as when buildings are up, streets built, and all the accessories to such finished. At this value the speculator sells the land to these mechanics. Mortgages are made for enough to pay for same, and as much more as is safe for them to advance, and still permit them to assign to a legitimate investor when complete. This advance, after deducting land, is about 50 to 70 per cent. of the cost of building, and is made from time to time, according to the advance of the building. They calculate, however, to retain about 20 per cent. of the advance until thirty days after completion. This, on a 70 per cent. advance, gives the builder 56 per cent., or, on a 50 per cent. advance, 40 per cent., to build with. The mortgagor or builder, having no capital, must owe all the difference, from 44 to 60 per cent. As labor must be paid, the material man cannot get even this ratio, and such reserve in the hands of the land owner or mortgagee insures the value of the land at the advanced price obtained from the builder. The builder is "hounded" by righteous creditors, and, realizing the enormity

of his undertaking, loses heart and gives it up before completion. Then the mortgagee takes same and completes it himself, at a profit of 50 to 60 per cent. of all the material furnished. Again, if the builder "stays by the wreck," and does not find an immediate market for the sale of his property, and owes from 30 to 50 per cent. of its cost, he is cajoled into another similar trade to get money to pay his old score, having expectations of selling both lots by the time of completion of the second. If unsuccessful, his debt is doubled, and, burdened with taxes, interest, insurance, brokerages and bonuses, he is compelled to surrender the property to the mortgagee or fail.

Another feature in this kind of business is that some dealers, more hopeful than others, in order to help the debtor get his work along, lend him money, vouch for him, and lead others into the same trap they have already sprung upon themselves. They thus divide their trouble, hoping to buoy the debtor up, and finally all are compelled to refuse further credit, and the bubble bursts.

If this class of venture was refused credit at first, no such trouble could exist. That they are not so refused is the sole fault of the dealers, who, in the case of brickmakers, are, to a great extent, the dealers themselves.

As practical lien laws cannot be enacted in some States, the only way to prevent future occurrences of this sort is by local associations joining their individual knowledge of credits.

They should report the standing of all applicants for credits over a given amount. They should select a committee for the purpose of considering the responsibility of such applicants, having similar duties to those of bank directors in discounting credits. They should carefully ascertain and consider the responsibility of the mortgagee. Such associations should use their influence and efforts in having strict and thorough building laws rigidly enforced. They should agitate all existing and proposed new building laws consistent with reason and equity. They should make the property, or interest in same, represented by mortgage equally responsible with mortgagor or builder, and in this manner prevent such undertakings by parties aiming to erect dangerous and inferior buildings, from shirking such responsibility by employing unreliable builders, either of workmanship or business capacity.

Dealing, as I have, so fully with troubles, if many do not consider it a calamity howl, some may think it the grumble of a croaker. But I wish it understood that I realize some of the blessings of pleasant memories and experiences; that every kiln is not a bad one; that but few purchases are to be viewed with suspicion; that the number of uninformed brickmakers is limited, and that animosity is hidden to a great extent by the good-fellowship of these pleasant gatherings, and that such organizations as this will eventually educate all up to a uniform knowledge of purpose and method, and will likewise attain the principles for which we strive.

I am not a croaker, but from my limited knowledge and experience perceive some of the difficulties with which we are confronted, and believe that from the character and principles of this organization, and its object of mutual good, more benefits can come from an expression of them here than in private. I am impressed with the kind and generous spirit which prompts and governs us, and am convinced that such is destined to win and finally convert all to the divine truth of brotherhood.

LOCAL ORGANIZATION—GENERAL DISCUSSION.

Secretary Randall: I had hoped that Mr. Frank Stiles would be present. He is a warm advocate of local organization, and believes that the success of the New England brickmakers, financially, is due to their organization. He hesitates ordinarily to talk in open session, for the reason, he says, that such talk, being reported in the press, goes back to his locality and makes trouble for him at home. It is the idea of the contractors that the prices are raised inordinately by these organizations. I know the New England brethren are making money, and have been for the past two years. The yards have run, if I understand correctly, nearly on full time; they are getting good prices, and they are in a prosperous condition, and they feel so rich that they are urging us to hold our next Convention with them instead of going to Boston.

Captain Crafts: We did not come here to get the news of our prosperous condition. (Laughter.) But, joking aside, the reason our heads are above water and we have not lost money, if we have not made very much, is because we are united. We are individually for ourselves and every manufacturer is for himself, but he has stock in an organization which sells all our brick and keeps a list of all the deadbeats, etc., and no D. B. can get any brick until he has paid his previous account, which is a hardship to him. Every original member is still in the New Haven organization, and they all own stock in the Brick Exchange. In New Britain they are bringing in the outsiders. The only man who is left out of the Exchange is a man who was not allowed to cheat, and it is a hardship to him.

Mr. D. V. Purington: What proportion of time did you run last year?

Captain Crafts: We ran about the whole of our season. The trouble is that our organization has not succeeded in raising the price of brick, but we have lowered the price of brick to what it was before.

Mr. Purlington: What is your price?

Captain Crafts: Prices vary from \$5.25 to \$6.50 at the shed, and when we sell paving brick, etc., they get up to \$9.50 at the shed. We would rather get more. We had to compete with Long Island and the North River, but not much with either. We can deliver our brick within thirteen miles of New York and have a regular market. The North River men got in and got a bite, and the parties who bought of them got bit, and so they have come back to New Haven again.

Mr. Yates: While they are happy and contented in Connecticut, and are all making money, the only objection we Boston people have is that they dump their surplus product on our market, at cost or below, and starve us fellows nearly to death. (Laughter.)

Secretary Randall: There is a thread running through this paper that I believe brickmakers would do well to heed earnestly—genial fellowship and local organization. If you do not have an organization, get together and become acquainted, and you will do better among yourselves. There will be friendship instead of enmity. The paper will repay you for a careful perusal and study.

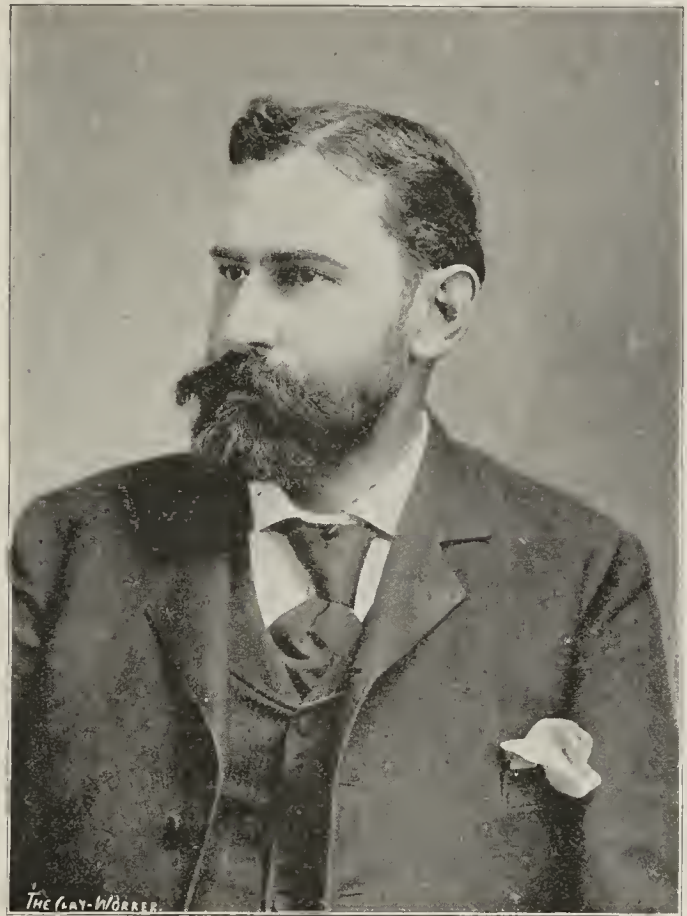
Mr. Taylor: For the benefit of the Association, as there is no one here to speak for the hollow brick men of New York, I would say that about two years ago they got together, tired of cutting one another's throats; in that process they got so thoroughly bled there was no more blood to flow, and they have formed an association within the last two years. I was told, on my way up here on Monday, that I might say that their association has enabled them to do their business at a profit—certainly the prices are from 20 to 25 per cent. higher than before—and while they have no binding clause or penalty in it, there is not a man inside who wants to get outside.

Mr. Bloomfield: With regard to the stove lining men, I will say that up to six years ago they were cutting each other's throats. There was a little dinner sprung upon them one evening without any notice. The gentlemen sat down at the table, and it was noticed that some of them glared at their friends across the table, but good-fellowship prevailed, and a few words dropped by one not interested, except in their success, led to a meeting the next day, out of which, as was supposed at the time, a temporary organization was formed. That organization has grown. They have a National Association, a New England Association, one for the district of New York and one for the district of Philadelphia. There was no money forfeit put up, no opposition but for one concern, and I am happy to say that that concern dropped out in a short time, and was the only one guilty of misconduct, and the sheriff has it. The rest of them have held together, and, notwithstanding the past three or four years of bad business, have paid dividends, and have been hugging themselves and each other, and are in good condition, and there is no reason why, in a fire brick or any other brick organization, there cannot be a local organization formed which will secure profits to every manufacturer in the United States, if they will only have confidence in each other, and when they get to know each other by a good dinner or meeting, as in this case, they will find that their brethren are just as worthy of confidence as they believe themselves to be. They should get together and know each other. (Applause.)

Secretary Randall: It has been requested that we hear from the President of this Association on local organization.

President Brush: I would rather not say anything on this subject, gentlemen. We have had an organization in Buffalo, in which we have had a good deal of experience—nine years of it. We have gotten along very well. We did not organize for raising prices at all, but to collect bad debts. It was carried along very successfully; we collected a great many bad debts, and it ran along until last year, when, through some slight

misunderstanding—I do not want to allude to it or hurt anybody's feelings—it was mutually agreed that we dissolve. We are on friendly terms, and, when we meet each other socially, are glad to see one another. This meeting to-day has been the means of reconciling me with some of our boys who used to be together. I knew it would. But the disadvantage we labored under in forming an organization was that we are in such a central location, railroads are so near, canals close by, lakes are at our doors, we not only have a great opposition from all the surrounding country, but other yards have started up near the city. We could not embrace all of them, and that is a vitally weak spot with us. If we could have taken them all in we could have managed to have held together, but a spirit of dissatisfaction sprung up among us which was fatal, coming along with the dull times. I must say that we have lost lots of money, although, when our association was running, we could afford to lose, now and then, a little, and still be ahead of what we are getting now. At present, I regret to say, we are all engaged in the laudable purpose of cutting one another's throats while we shake hands, but perhaps we may



CHAS. BLOOMFIELD, New York City.

get over this. When the boys have all spent what surplus cash they have, and they look over their balance sheets, we may have a meeting and make up. (Applause.)

Secretary Randall: The next subject is the first question of the fourth session:

IS A VITRIFIED BRICK SUITABLE FOR BUILDING PURPOSES?

Mr. D. V. Purlington: I have a very long address to make on this subject, and it is embraced in one simple word, "Yes."

Mr. Taylor: Mine is shorter: "No." (Laughter.)

Mr. Fiske: Mine is between the two. I will say that possibly it might be, but usually a vitrified brick will not take the water and will slip on the wall.

Mr. Dibert: If they are laid in the right kind of weather they will not slip on the wall, but if laid in wet weather they will slip.

Mr. Gates: I have in mind a building put up of vitrified brick, made of paving shale, that certainly stands very well,

and is an acceptable building and highly thought of. I have heard one thing in regard to it: that in damp weather they found it impossible to lay more than three or four courses of brick, owing to there being no absorption of the water, but the wall is a very strong one. The mortar has set slowly, but very hard. It is not a soft clay brick.

Mr. Merrick: I am not a manufacturer of paving brick, but I know if you throw mortar on to a plate-glass window it will stick. I cannot see why a paving brick used for building purposes should not hold mortar as well as a pane of glass. It seems to me reasonable that paving brick could be used as a building brick.

Mr. Carson: We built a stack for our continuous kiln, one hundred feet high, of vitrified brick, and have had no trouble with it.

Mr. Chambers: I know of a manufacturing building in the neighborhood of Philadelphia laid up with vitrified paving brick, and it is a satisfactory building. The brick were laid rather slowly, as compared with a brick which will absorb water rapidly, but with that exception there was no change in the method of using the brick, and the building is a very satisfactory one for that purpose.

Mr. Purington: Mr. Chambers struck the keynote in answer to these objections. It is mechanically impossible to lay a large number of these brick before the absorption of the water in the mortar takes place in order to keep them in line. In the building Mr. Gates refers to, for the first story the contractor had trouble in laying the brick, but after he got used to it he put on fewer men and went around the building more frequently, and gave the mortar time to set. There are over 600,000 of the brick in the building; it is the largest front brick job in Chicago in six years. It has attracted a great deal of attention, and I have not heard of adverse criticism since it was built. After the mortar has set I do not think any one will take exception to the condition of the wall for all time.

Mr. Taylor: That is the point at issue. You cannot get contractors willing to properly set the brick. The brick, being vitrified, does not absorb the moisture out of the mortar joint, and when you have on three, or, at the most, five courses, your bottom bricks will squeeze out of plumb. The objection is met by saying, "If they go slow;" but will they go slow?

Mr. Purington: The contractor has nothing to do with it. The architect specifies the bricks and the contractor has to lay them.

Mr. Yates: We are situated at the present time in this condition: We secured the contract to supply vitrified face brick for a building in Newton. The first thing we met with was an objection by the contractor to laying them, and he wanted us to ante up about six dollars a ton to make it good. We asked him to step out, and we took the contract ourselves. We appointed our own foreman, a mechanic who understands his business, and by adding a little cement to the mortar the job has gone along satisfactorily and profitably, and reflects much credit upon the brick. A brick which is too porous will absorb moisture, and decomposition takes place. In the past, buff brick received a black eye on high class work, for the reason that decomposition effaces these bricks, and the architects say we shall have to go back to the old red. It is in the interest of all to burn thoroughly a vitrified face brick, which will retain its color, wherever it is placed, for the present and all time to come.

Secretary Randall: The next question is:

WHAT MUST BRICKMAKERS DO TO BE SAVED FROM BANKRUPTCY?

Mr. R. B. Morrison: It has been suggested that you strike out the last two words. (Laughter.)

Mr. F. H. S. Morrison: What I say now is serious. I am engaged in selling brick, and have traveled through this country from Boston to St. Louis, from New York to Atlanta. I have visited most of the face-brick yards, and know something of the troubles that the brick manufacturer has to contend

with. All the troubles go to add to the expense and cut down profits; in other words, they are leading him in the opposite direction from being saved. I have been here for two days, and have heard more questions answered, more problems satisfactorily solved, so that any intelligent man can understand the solution, than I have heard during my whole connection with the brick business in the past. I say, if the brick manufacturers of this country want to be saved, that the thing for them to do is to give this Association the support which it merits, to attend its meetings and go home and practice the principles that are laid down here, and there will be fewer bankruptcies in the future. (Applause.)

Secretary Randall: The next question, "Does It Pay to Use Fire Clay Mortar in Kiln Building?" was considered in the discussion yesterday, so, if there is no objection, it will be passed at this time. This brings us to the next question:

WHERE CAN PAVING BRICK BE SORTED TO THE BEST ADVANTAGE, IN THE KILN OR IN THE YARD?

A Voice: In the kiln.

Secretary Randall: If there is no further discussion on that question, we will proceed to the next:

WHAT WILL BE THE EFFECT UPON THE DRY PRESS PROCESS OF THE INCREASING DEMAND FOR FACE BRICK MADE BY THE MUD PROCESS?

Mr. Hoagland: We have a plant in Indiana which manufactures both stiff mud and dry pressed brick. The stiff mud process has recently been put in and not many bricks manufactured, but we have been selling the product of this plant for several years, and we find that our demand this spring for dry pressed brick is greater than before, but notwithstanding that there is some inquiry for stiff mud brick. We have put in a stiff mud outfit, because we had to put in a drier, and it was very little additional expense to put in the stiff mud process. I think this question can be answered by almost the same words used—by asking another question, What has been the effect upon the stiff mud process of the increasing demand for face brick made by the dry press process? When dry pressed brick came on the market they had a finer finish than stiff mud brick, but it will be granted a great improvement has been made during the past few years in the manufacture of stiff mud brick in straightening them up and getting them nearer to what the dry pressed brick is in that respect. The greatest objection found to dry pressed brick by those in favor of stiff mud brick is the absorption. I understand a dry pressed brick will absorb nearly a pint of water. There is some improvement being made now with a steamer, and it is believed that brick made with a steamer will not absorb as much water as those made without it, and improvements of this kind will still keep the dry pressed brick on the market. The dry pressed brick machinery men have discovered that the stiff mud brick is injuring their business. If this continues to be so they will devise some means or other to help us out of the difficulty. I am sure we should like to have some attachment so that we can make a soft mud brick, if necessary, by the dry pressed process. My answer to the question is that it has the effect of stimulating the dry pressed machinery manufacturers to better their machinery in order to get the product nearer to what is required.

Mr. Fiske: Do you have the same prices for the two kinds?

Mr. Hoagland: Our stiff mud brick is new, and we are going to get a little better price for it.

Mr. Purington: By what process do you make your stiff mud brick?

Mr. Hoagland: Regular auger machine and side cut.

Mr. Purington: I have never yet seen a brick made on an auger machine that will be anywhere near as good as a brick made on the dry press. It does not seem possible that you can make a brick on an auger machine and have it perfect after it is made. It has concavity and convexity which will appear in the brick. I have made a great many pressed brick by the

stiff mud process, but they have not been satisfactory.

Mr. Hoagland: There are some bricks upstairs in the exhibition room, made by the stiff mud process, which are as perfect as any pressed brick you ever saw.

Secretary Randall: I have a communication about steamers which seems to fit in here. To my mind the preference for the stiff mud brick at this time is simply an architectural fad. They are going from plain and severe surfaces to rugged surfaces. It is not because dry pressed brick are not good brick, or that we do not make good dry pressed brick, but because the architects have a fad for the stiff mud brick.

"WHAT WILL BE THE EFFECT UPON THE DRY PRESS PROCESS OF THE INCREASING DEMAND FOR FACE BRICK MADE BY THE MUD PROCESS?"

To realize the situation is what dry press men must first do. The writer once visited a soft mud stock brickyard in Pittsburg, and noticed the very great care taken by the manager to have the brick sorted for color. There were fourteen shades of red, and the piles in the shed were very uniform in color, while the quality of the brick otherwise was very indifferent. The writer suggested that the quality of the brick would be very much improved by crushing and screening the clay, thereby removing the stones that were cracking and marring the face of the brick.

The foreman in charge replied: "Oh, everything goes here." It occurred to us that their policy was simply inviting the competition and use of brick of a better quality, which builders certainly would demand, and had the same care been exercised in making as in sorting the brick of this plant the business of the company would have been enlarged, their customers satisfied and their profits increased. The company that adopts the policy of "everything goes" will soon see their plant go into the hands of the sheriff.

"Everything goes" has too often been the policy of dry-press-brick makers, but they are beginning to realize the fact that they are losing trade, and must do something to regain it. There is a demand for mud brick because the dry press people have not been furnishing a uniformly good brick, and, in view of the situation, the question arises, what shall be done to improve the quality of dry press brick so that builders and architects will be satisfied, and not be compelled to use the more expensive and less beautiful brick?

The dry press brick is cheaper to make than a repressed brick, and, when properly made, has better edges, is more uniform in thickness, has a crushing resistance far beyond any demand that may be made upon it, makes a more handsome wall, and bricklayers prefer to lay them, especially in cold and freezing weather, because they do not slip in the wall, but stay where they are laid.

Many dry press brick are not what they should be, because the clay is not properly prepared. The clay is pressed too dry. Clay, when too dry, will crack easily under pressure, and the pressman's only remedy is to turn off the pressure, and brick made under such circumstances cannot be satisfactory. They are easily marred in handling, will crack under the weight in the kiln, will stick together in the watersmoking and burning, and, when taken from the kiln, will be only a poor quality of chimney brick. The tendency of brick of this kind to stick in the burning is shown if the test is made of burning them beside brick that have been made of well weathered, steamed clay. The steamed clay brick part from each other with smooth, clear faces, are solid as metal, are free from cracks, are very different brick from their dry soft pressed neighbors, and he who makes the test needs no other argument to convince him that clay for making dry press brick must contain a certain amount of moisture, the amount varying with the kind of clay used, and when the time comes that all dry press brick manufacturers come to this conclusion and make their brick accordingly, then will the demand for mud brick diminish and the dry press, or, rather, semi-dry or semi-plastic brick, made on what are now called dry press machines, will take and hold their place as the first brick of the land.

The best way of obtaining uniformly moist clay is by the use of the clay steamer. Many brickmakers obtain fairly good brick by moistening their clay with a stream of water in the dry pan. This, of course, means trouble and loss, because the water makes the clay clog in the pan, the clay builds under the pan, making the scrapers drag heavily, and taxes and strains the gearing and the engine, consuming power and patience and very seriously reducing the capacity of the pan and screens. It is necessary to keep a good man to keep the screens clean, or shut the whole mill down to have a scraping match.

The loss in capacity from the above causes runs from three to five thousand per day on a four-mold machine. This trouble is obviated by the use of the clay steamer, and many points of advantage are gained, of which we will name a few.

The press works steamed clay easily without strain, and makes a very dense, firm brick, with sharp, hard edges, that can be handled without breaking off the edges. The brick are warm and moist, and when made in winter the clay has all the frost steamed out of it, and where the brick are dried the brick are just right to proceed in the drying process, and do not have to undergo a sudden change of temperature, but are warm and moist, like the receiving end of the drier in which they are placed. They go through the drier with less checking; in fact, we know of cases where checking was stopped altogether after the steamer was put in.

The greatest difference is noticeable in the kiln after the brick

are burned. I have shipped first-class buff brick, practically the same color out of every one of the thirty-one courses in the down-draft kiln, to the same job, and the brick were satisfactory.

The use of the clay steamer will go a great way to enable the manufacturer to produce a brick that will hold its own with and head off the mud brick. Good quality is what architects and builders want, and the steamed clay brick has a quality that cannot be questioned, hence it follows that one effect upon the dry press process of the increasing demand for mud brick will be better dry press brick, made with the use of the clay steamer.

The matter of the selection of a steamer is one in which great care should be exercised, and the following points should be watched, viz.: select one that has no screw or conveying device to roll and ball the clay. Select one in which there is no mechanical action against the clay after it is steamed, and one where the clay falls by gravity down the pipes or legs to the press.

One drawback against the introduction of the steamer into old or established plants is the change required in the screen and hopper to suit them to the new steamer. A cool calculation of results should convince any dry-press-brick maker that it will pay to make the change at any reasonable cost.

Good dry press brick may be made without a steamer, but better brick can be made with the steamer.

Dry press brick may be made at a profit without the steamer, but there is more in using a steamer.

Dry press machines should be adapted to feeding very damp clay if desired.

If pavers are ever successfully made by the dry press process a clay steamer will be used with the machine.

Many clays are improved for dry press brick by adding grog.



W. H. HOAGLAND, Detroit, Mich.

The steamer makes the use of grog possible. Some very plastic clays that cannot be successfully worked make excellent dry press brick by adding grog. I have worked a clay of this character with best results.

One serious trouble with brick companies, and especially incorporated companies, is their slowness in making necessary improvements. The Superintendent will suggest that a certain machine, necessary to the success of the plant, be purchased; the Board of Directors will take the matter under consideration, and conclude the suggestion is good and the improvement is a proper one to make, but defer action. The plant runs along under the disadvantage. The result usually is a loss of several times the cost of the suggested improvement, sometimes of the whole plant. We gather from this the necessity of prompt action in adding to the plant any machine that will improve the quality of the product and lessen the cost of the output. Machines of this kind always pay for themselves, as well as swell the dividend account.

Mr. Purington: Mr. Hoagland, is your plan to repress a stiff mud brick?

Mr. Hoagland: Not necessarily so.

Mr. Purington: If they are repressed you can get as good

service out of them as any. I inferred you were using a rough surface brick.

Mr. Hoagland: The gentleman who put this question in the list probably did not have data from all over the country. There may have been some increased demand in some certain city that may have been for a color effect, and not from the fact that it was a stiff mud brick. There are many stiff mud bricks with a color distinct from anything else, and they are selected on that account, not because the brick were made by the stiff mud process. There are a great many improvements yet to be made in the manufacture of stiff mud bricks for building purposes. We find that in grinding, say for arches, it is impossible to grind a stiff mud brick economically. Therefore it is necessary to cut that brick green in the arch shape before burning it. There are experiments being made as to the most economical way of cutting the green brick. Another objection is, it is hard to get stiff mud brick to match in color. Some architects want them to a color and some want them variegated. The brick upstairs match perfectly.

Mr. Richardson: Most of my experience in making face brick has been in the dry press process. I was in hopes, in answer to this question, that we would hear from some of the large buyers of brick. We are starting in the dry pressed brick business again and getting some inquiry from the material men in the East and West for this brick, and men to whom we used to sell largely dry pressed brick have been inquiring now for the mud brick. I am speaking of some of the largest dealers in Chicago, Detroit and Boston, who are now inquiring for the mud brick. Why they are doing that I do not know, and whether it indicates any universal tendency in that direction I do not know.

Mr. F. H. S. Morrison: In regard to the market for the brick, the use of dry pressed or stiff mud brick depends entirely on the market in which you are selling. The markets in the West were not as conservative for a long time, and are not now (that is, the architects), as the architects of the East; but the architects of the East are gradually coming to the ideas of the architects of the West in regard to dry pressed brick. In 1893, in the city of Baltimore, all the face brick that we used was stiff mud. There were few leading architects who would talk about a dry pressed brick. They would say, "We cannot experiment at the expense of our client; the stiff mud brick is good enough for us, and we will keep on using it." As a matter of fact, to-day 90 per cent. of the high grade face brick used in the city of Baltimore are dry press. In Philadelphia the dry pressed brick predominates, and in the market of New York to-day we can go into architects' offices who would not have listened to us three years ago and sell dry pressed brick. We handle both kinds of bricks in the New York market. Our experience is that we are selling to-day four dry press bricks to one stiff mud brick. It is true that there are some architects still wedded to the latter, and the main point that they use is that a great many architects do not like the kind of surface that we get on a dry pressed brick; it is too smooth; they like the rough effect. At the same time, in our market the coming business is the dry pressed brick, and we get about the same price for it. There is very little difference in the price of white and gray brick in the New York market. There are more dry pressed gray brick being used than stiff mud. All of the schoolhouses being put up now are using a dry press gray brick. The business is coming right along, and while I am not wedded to either class of manufacture, at the same time, if I wanted a brick to sell on the New York market to-day, I would take a real good quality of dry press brick.

Mr. McAvoy: The Western people used a dry clay brick many years before they used it in the East. It seems now that they have gotten through with the dry clay and come back to the stiff clay. We were a little late in taking up the dry clay in Baltimore, and we are not going to change too hastily. We are going to wait and see what the other fellows do.

Mr. Webster: One objection I have to the dry pressed brick is the glazed appearance of that brick. When they are laid up

they have an appearance of being somewhat glazed and not all of the same shade. They do not have the velvety appearance of the old-fashioned pressed brick. Our people did not like them after they were laid.

Mr. Gates: I have a theory, and that is about the only thing I like to give away. So far as I have seen in the use of the repressed brick during the last season, it has been a great deal for novel effects, and a great deal of the novel effects has been because architects wanted a glazed surface effect that has been produced on the repressed bricks, and they are after the color effects to a certain extent. Then, too, they like them because they are impervious to moisture. Many of the repressed bricks now have a semi-glazed surface. It is a skin which is impervious to moisture. My theory of that is that the finer particles of clay, in being subjected to this pressure, creep past the coarser particles, leaving a thin skin of fine clay on the surface, polished in passing through the die, and kept on the surface by the repressure. This appears in the building in Chicago of which Mr. Purington and I have spoken. The brick had a semi-glazed surface. It was a vitrified brick. They called it a Colonial brick. It had a Purington (Puritan) effect. (Laughter.)

Secretary Randall: The next question is in order: "What Is the Proper Way to Take a Fair Sample of Clay for Analysis or for Test?" If Professor Orton were here he might answer that to the advantage of those who desire to have clays tested. But he is now absent from the room. We will therefore take up the next question:

CAPITAL SUNK IN NEW BRICK PLANTS—CAN IT BE PREVENTED?

Mr. Fiske: There is no subject of much more importance to brickmakers than this. Some one said, when he read this question, "Why, kill off the machinery men and the kiln men, and you will stop that sort of thing." That may be so to some extent, but then, if we should kill them, which we do not want to do, we should be killing our best friends, because we all know how very much we brickmakers owe to the machinery men.

A Voice: Yes, the most of us. (Laughter.)

Mr. Fiske: We owe a great deal to them for their genius and enterprise. On the other hand, of course, we owe ourselves something. If we, as practical brickmakers, should say, "We have plants enough now to supply all the wants of this country; let us pass a law forbidding the establishment of any more brick plants," we should draw down on our heads at once the just criticism of the people, because we should be stopping fair competition as well as unfair competition. I have now in mind particularly the manufacture of pressed ornamental brick; it is in that direction where the new plants established are doing the most mischief. The manufacture of that class of brick has fallen off 42 per cent. in 1895 over 1894. These figures are enormous. The probability is that stocks on hand have increased, so that it would be safe to say that the actual demand for that class of brick has fallen off 50 per cent., but in the face of that there have been new plants started and others contemplated. Let me illustrate by one case in mind, which takes, possibly, five million of fancy colored and nice pressed brick, supplied by perhaps a half dozen different factories. Now, of course, some of these factories are supplying other factories also, because five million bricks would not go a great ways. Now, there comes into that market some one, presumably machinery men, kiln men, some one who puts up a whole plant, and has gotten hold of some capitalists and said to them: "Look here, do you know how much money there is in the fancy brick business? They easily get \$25 a thousand." They show figures and say, "You can manufacture the brick for \$10 a thousand. See the enormous profit!" They induce the parties to start in with the plant, which may cost anywhere from \$50,000 to \$200,000, and all the estimates of cost are made upon a production of five million bricks, and yet these capitalists are so blind that, while they believe they can man-

ufacture the bricks, they never think where they are going to sell them. A ruinous competition then comes up in such cases, and we have a right to protest against the establishment of such competitive plants. How can we stop it? We cannot blame the machinery and kiln men for desiring and instigating the establishment of new plants. It is their business, as it is ours, to induce the architects and owners to use brick instead of wood or stone. The clay journals might take up and agitate this question, but they are not likely to do it, because the machinery men are their patrons, and it won't do for them to bear on too hard in that direction. Some of the manufacturers may do some good in sending to these clay journals communications setting forth the facts. Again, I would suggest to Mr. Day, who gathers these statistics, that he also gather information on one other point—stocks on hand—and have that published. If we could get statistics of stocks on hand they would run up to enormous figures. That would be, perhaps, a little discouraging in the way of establishing new plants. The world is full of fools, and they will put their money into foolish enterprises, but it does seem as though they are turning their eyes to the clay industries more than to other lines of business. (Applause.)

Captain Crafts: The great trouble is that the men who never made a brick, and know nothing about the business, figure it out that they can make brick cheaper than any one else. We had a grocer in our vicinity who thought he saw how much money there was in the brick business. He went to Chicago and got a guaranteed plant to make dry pressed brick, and told everybody that he would drive our pallet brick out of the market. He ran the yard into the auctioneer's hands and went to the grave. Another man was telling about the profit he made on his brick, and he sells them at less than we do. How he can manage to make brick and burn them to put on the market at \$2 a thousand I do not understand.

Mr. F. H. S. Morrison: I do not think the machinery men are so much to blame as the men who go into the business. Let somebody think you are making money out of any business, and you will find plenty of people going into it blindfold. These people do not know what they are doing. They get an oversupply, cut the price, they fail, and the men who have the experience come out on top. A man must not go into this business blindfolded. What man in this city would go and buy a piece of property without having the title examined? And yet you will find plenty of fellows who will tell people they can make \$25,000 out of brick, and they will let them have the money. What we want is practical management in the different departments, and that men should avoid undertaking a business when they don't know anything about it. Those are the men who are sinking the money.

Secretary Randall: We will now consider the question:

**ARE BRICK DWELLINGS CHEAPER IN THE LONG RUN
THAN FRAME HOUSES? HOW CAN WE DEM-
ONSTRATE THE FACT TO HOME BUILD-
ERS MOST EFFECTIVELY?**

It has been suggested that Mr. Bowen should lead this discussion.

Mr. Bowen: I think I am the least prepared to speak intelligently on this subject of any gentleman in the room, coming, as I do, from a timber country, with a limited experience in clayworking. I certainly think that brick buildings are cheaper in the long run, and I would like to be able to convince our people of that fact, but with the abundance of good timber at our door I fear it will be a long time before I can do it.

Mr. Eudaly: I believe this relative cost of buildings will vary in different localities. In Cincinnati, a number of years ago, when I was trying to sell brick, that question often came up, and we had architects make plans of buildings similar in size and the same arrangement all the way through, and to estimate the cost of the building when completed in wood or in brick, so as to get a comparison of the cost. They estimated

on several different forms of buildings, and agreed that twice repainting a frame building would make the cost about equal with the brick building. We often used that as an argument in selling brick.

Mr. J. E. Clapp: We are called on to figure on a set of plans for both wood and brick buildings, and we have no trouble in convincing people that there is no question of the brick building being cheaper in the course of two or three years. The first cost of the brick building in our locality is perhaps a little more, about the difference between the mason work in laying the brick and the carpenter work in putting up the frame building. It is largely a question of labor.

Mr. Adams: Mr. Eudaly's suggestion is very far from the facts in any locality that I know of. With us it is about 20 to 25 per cent. more for brick. Of course, there is a saving in insurance, painting and general repairs, which, in the long run, in a brick structure, saves a good deal of money; but the most forcible argument that can be presented to the people of our several cities is in the line of the experience which the city of Chicago passed through many years ago, when she was burned to the ground. That is a potent argument, and makes



J. C. ADAMS, Indianapolis, Ind.

an impression which is lasting. When these cities of the West grow up as cities of cottages built of wood, and a conflagration comes along some day and wipes them off the face of the earth, the next generation will build brick structures.

Mr. Clapp: The cost of wood buildings can be varied. With us we calculate on a well-built wood structure, good studding, sheathing both inside and out, lathing and plastering. We are talking about a first-class wood building, not the cheapest.

Mr. Adams: In view of the suggestions offered by the gentleman, it is right for me to say that the increased cost is not in the material, but in the labor of construction. The country is full of jackleg hatchet and saw carpenters at \$1.50 a day, but brick buildings must be put up by bricklayers at 50 cents an hour. The Bricklayers' Union is the strongest organization in this country. I saw one of my old men the other day, who earned \$1.50 a day digging clay. He is now a full-fledged contractor. The Bricklayers' Union holds to the text, and their

wages do not vary. It is the best organized labor organization known in the Western country. If we could get bricklayers as cheap as carpenters we could build a brick house as cheap as a frame one.

Mr. Richardson: I think this is a question which might possibly be discussed by our Association with some profit. A worker in wood must necessarily be something of a mechanic, and he must have at least a hundred dollars' worth of tools; but a man, to be a bricklayer, only needs two or three dollars' worth of tools and practice in laying brick perfectly square.

Mr. Eggers: All he needs is a trowel.

Mr. Richardson: Why should the brickmaking industry be put at that disadvantage through the very high wages of bricklayers? A carpenter who is a good mechanic can be employed to build a frame house at about \$2.50 a day, whereas, when you want a house built of brick, you must employ a man who may not be a mechanic, and he wants 50 cents an hour. Can anything be gained by this Association or by a local association in discussing these questions to relieve, in a measure, the brick manufacturers from that disadvantage?

Captain Crafts: The strength of the bricklayers' organization is such that when an English mason comes to this country to lay brick he is obliged to pay a royalty, independent of his English union, which goes into the hands of the American bricklayers; and still he manages to save money enough to pay his passage to and fro, and make it better for him to come to this country than to stay at home.

Mr. Clapp: In speaking of wages, I hire both carpenters and bricklayers. I have had some masons at \$2.50 a day and board himself and some at \$3.50 a day with board. If I could have had all of them at \$3.50 a day with board I would have been a good many dollars ahead. Hiring poor carpenters or masons is a poor investment; it takes a good man to watch him to see that he does his work right. The three-dollar-and-a-half man this summer was a union man, but there was no union in our place. I told him when I hired him, if he was a union man and had come to run my business he was not in it. He did good work, and the higher priced man was the cheaper. I do not think that cheap wages are profitable.

Mr. McAvoy: Gentlemen, we are treading on dangerous ground. If we have to reduce bricklayers' wages to make money in making brick we ought to quit the business. (Applause.)

Mr. R. B. Morrison: We ought to be consistent; we ought not to blame the bricklayers for doing what we want to do so badly ourselves. (Applause.)

Mr. Dibert: A man can take a saw and hatchet and put together something that will stand, but it takes a practical man to lay brick. In our city they used to get \$5 a day, but now they only get \$3.50 since the union has been disbanded. I want to go back to the question of vitrified brick and take a sanitary view of the subject. Many persons object to brick on account of its being damp. If brickmakers will make a good hard brick which will not permit water to penetrate it beyond a certain extent we will have more brick houses.

Mr. Eudaly: The Hon. John Sherman made a good point in connection with this subject when he was interviewed not long ago. He said that bricklayers' wages ought to be higher than carpenters. They had to work outdoors in the rain, and didn't work more than half the time that carpenters did.

Mr. Merrick: I believe it is possible to make a brick house almost as cheap as a frame house. Hollow brick, now being used so much by the architects as an inside course, makes a dry wall and damp-proof building, and does away with the lath and nails and much carpenter work. When we come to count the lath, nails and carpenter work and the painting there is very little difference. I believe it is the business of the brickmakers to talk of these things to the architect more than we have done in the past. I talk continually in my city about putting up a building with the hollow brick lining, which will cheapen your building, make it drier, rat-proof, and do away with lath, nails and a lot of carpentry.

Mr. McAvoy: If we have bricklayers at \$5 a day they can afford to live in a brick house, and if they get only \$1.50 a day they cannot afford to live in a brick house. (Applause.)

Mr. Taylor: All the discussion so far has been on the first clause. The second clause is, to my mind, the most important: "How Can We Demonstrate the Fact to Home Builders Most Effectively?" I have just noted down a few answers to that question: First, by every brickmaker living in a brick house; second, by every brickmaker doing his business in a brick office; third, by every brickmaker doing his work in factories made of brick. It is a common item of news to hear that such and such a factory has gone up in smoke, and yet they are engaged in producing a fire-proof material. You may ask, How can we cheaply cover our large open kilns? I reply, Use the thin tile arch, known as the Florentine, because it has been used in Florence, Italy, for many centuries. It is self-supporting, requires no center in building, and any brickmaker can make his own tiles, splitting with wire cuts some of his own green brick into four tiles, or three cuts; burn without separating; when burned they will separate when gently tapped on edge. If you would convince others of your faith, you must support your belief with your own acts. (Applause.)

Mr. Fiske: It would be interesting to know how many brickmakers live in brick houses.

Mr. Eudaly: Must we own the house? (Laughter.)

President Brush: Will the gentlemen who live in brick houses kindly rise? I count but twenty, although this seems a small number.

Captain Crafts: The boarding house I live in is made of brick.

Mr. Adams: I live in a frame house, but have 125,000 brick in the house.

Secretary Randall: I think this is one of the most important subjects for our consideration that we have had before us. I will endeavor to have a paper at our next Convention along that line. The next question, and the last, is:

DOES IT PAY TO SOAK CLAY WHICH HAS BEEN GROUND AND SCREENED BEFORE PUGGING IT, WHERE THE PRODUCT IS STIFF MUD BRICK?

Mr. D. V. Purington: My answer would be that, unless you can get more than \$4 a thousand for them, it won't.

Secretary Randall: The next business is the report of the Commission on Standard Specifications and Methods of Testing Paving Brick, by Prof. Edward Orton, Jr., Secretary.*

REPORT OF THE COMMISSION ON PAVING BRICK TESTS.

A partial report of the work done by the commission was submitted to the Association at the Atlanta Convention, and for that reason no time will be occupied in restating the matter there brought forward, except in so far as may be necessary to connect the events into a satisfactory whole.

At the first meeting of the commission the whole subject of testing paving bricks was discussed, and it became evident to all the members that it was impossible to present a conclusive report on the subject until a considerable amount of careful investigation had been instituted. Therefore, the work of making these investigations was partitioned among the members of the commission and among the other gentlemen who met with us on invitation and who have acted as members of the commission since. The amount of the work to be done and the time required in making preparations for it absolutely prevented a conclusion of the work of the commission at the date set in the resolution creating it, but at Atlanta the Association extended the time till this date and made suitable provision for the necessary expenses of the investigation.

At a recent meeting held in Indianapolis the report of each member of the commission who had been assigned a portion of the work was heard, a brief resume of which is given below:

The tests which were originally designated for investigation, with a view to making use of them as a means of estimating the quality of brick for paving purposes, were: 1. Rattling, as a measure of toughness and wearing power. 2. Absorption, as a measure of vitrification and resistance to freezing. 3. Cross breaking, as a measure of structural perfection and freedom from defects due to manufacture. 4. Crushing, as a further indication of the same factors. 5. Hardness, as a confirmatory test of vitrification. 6. Spe-

*The charts and diagrams used by Professor Orton to illustrate his report were not in shape to be reproduced. They will be given complete in the near future.

cific gravity, as a guide to the density and fineness of texture of the material.

1-RATTLER TEST.

The rattler test, in order to give comparable results, and to be sufficiently vigorous to give data of value and yet not so vigorous as to ruin any materials which might be put into it, before giving an opportunity to judge of their relative wear, required a very careful and systematic investigation.

THE STANDARD BRICK.

Before beginning on this active work of testing, it was above all things necessary to obtain a standard sample of paving bricks, whose uniformity should be developed to the highest point attainable under actual manufacturing conditions.

The Canton Brick Company, Canton, O., very generously made offer of a carload of brick, to be selected from a kiln of their wares on any terms I might dictate. The number required was chosen in a compact block from the heart of a kiln of pavers. Stripping off the two top courses a block ten courses deep and fourteen courses long was removed, keeping five courses from the bag walls on either side and seven courses from the wicket. There were sixteen courses underneath those chosen. All liability to air checking, soft burning, overburning, etc., would thus be reduced to a minimum. These bricks were carefully drawn and shipped to Columbus and stored as a permanent supply in the testing rooms of the clay-working laboratory of the Ohio State University.

THE RATTLER.

The rattler employed in most of the succeeding work was one built to order for the university, according to the provisional specifications adopted at the first meeting of the commission. It was 28 inches in diameter and 61 inches long, with a movable diaphragm, capable of adjustment backward and forward, making two chambers of variable length. It was a regular polygon of fourteen sides, in cross section, and was strongly built of soft gray cast iron. It was driven by gear and pinion, with a ratio of $8\frac{1}{2}$ to 1 and by a 16-inch pulley, 6-inch face. A constant speed electric motor of fifteen-horse power furnished the power.

The first point to be ascertained was the quantity of material which would occasion the greatest loss by rattling. Inasmuch as all bricks and stones vary considerably in specific gravity, it is plain that volume would be the only fair basis of comparison. Hence a series of charges were weighed out, whose aggregate bulk amounted, respectively, to 5, 10, $12\frac{1}{2}$, 15, $17\frac{1}{2}$, 20, $22\frac{1}{2}$, 25, 30, 35 and 40 per cent. of the internal cubic contents of the rattler. These were rattled for 1,000 and 2,000 revolutions each, and then losses tabulated.

The results show that a maximum loss occurs when 15 per cent. up to $22\frac{1}{2}$ per cent. charges are used; 10 per cent. and 25 per cent. are slightly below this maximum, while 5 per cent. and 30 per cent. and above fall off rapidly in losses, due on the one hand to too little crowding and on the other hand to overcrowding and lack of room to fall. The practical lesson from this investigation is that not less than 10 per cent. should be used for any test and that no gain can be had by employing charges of more than 15 per cent. in volume. The next point to demand attention was the effect of time on the rate of loss by rattling. How long shall a test be rattled? Does it make any difference on the rate of wear? To settle this point four charges of 10, $12\frac{1}{2}$, 15 and 20 per cent. volume, respectively, were rattled for periods of ten minutes, or 250 revolutions each, and weighed; and then for other periods of ten minutes each until each charge had received in the aggregate eighty minutes' rattling and eight weighings. The losses being tabulated showed that the rate of wear was greatest in the first ten minutes, and less in regular order for each subsequent period.

But after forty minutes, or 1,000 revolutions, the rate of wear was only slightly less each time, and was plainly due to real wear, while the earlier losses were just as plainly due to corners and edges being knocked off. The evidence shows that not less than 1,000 revolutions would give correct comparison, and also that a longer test of 1,500 or 2,000 revolutions would be better, as it would give the brittle bricks a chance to average up with softer burnt, tough bricks, which lost only by wear and not by chipping; that the former suffer worst at first is certain, and that they suffer least at last is probable.

The next point to be proved was the effect of the length of the chamber used in rattling. If all rattlers used for brick testing were made for this purpose and of uniform size this test would be unnecessary. But, as a fact, the rattlers used in the past include every size, every length, every speed and every kind and quantity of charge. Hence, to get uniformity of results all conditions which can affect the rate of wear must be made the subject of accurate specifications. To test the effect of length, charges of 10, 15 and 20 per cent. were weighed out, and rattled in chambers whose diameter was always 28 inches, but whose length by means of the adjustable diaphragm was made 12, 18, 24, 30, 36, 42 and 48 inches, respectively.

The tabulated results show that the rate of losses are practically the same for each volume of charge employed, and the fluctuations indicate no fixed tendency either up or down.

From this it is fair to conclude that the length of the chamber is of no importance, if a standard volume of charge be employed in each case.

The next variable element to be considered was the diameter of the rattlers. Engineers have used in the past rattlers from 16 inches in diameter up to 36 or 48. It is hardly conceivable that results are the same in all of these sizes. Accordingly, the use of a series of rattlers of 16, 18, 20, 22, 24, 28 and 34 inches diameter was

secured in various shops and foundries, and charges of equal per cent. of volume were used in each at a uniform speed for a uniform time. The results, when tabulated, show that the rate of loss increases, all other things being equal, with the diameter up to 28 inches. Increase above that size showed no increased rate of loss.

It is to be further considered that the uses to which rattlers are ordinarily put divide them naturally into two classes: the small ones for light work, which vary from 12 to 20 or 22 inches in diameter, and large rattlers for heavy work, which vary from 26 to 48 inches. The intermediate size of 24 inches is a very rare one in the city of Columbus, at least, and none could be found after a search extending over one hundred different machines. The tests made on that diameter were finally obtained from the St. Louis Testing Laboratory, from bricks shipped there for that purpose. Consequently, in order to make these tests widely useful a size must be selected which engineers can obtain easily, and this would necessitate the use of machines of large diameter (from 26 inches up), rather than the smaller sizes which are, of course, much less vigorous in their effects.

Also, since larger sizes than 28 inches seem to fail to produce proportionately greater wear, and since larger sizes would, of course, demand the use of larger and larger quantities of bricks to fill them to a standard volume, it follows that no benefit can be obtained by using sizes above 28 or 30 inches.

The remaining condition affecting the use of the machine itself is that of varying speeds. The question to be determined is whether



W. D. GATES, Chicago, Ill.

the duration of a test can be measured in time or in revolutions where speeds are different or variable. In other words, is the loss per revolution the same for all speeds, or does it vary with each speed employed? To determine this point charges of one volume were rattled successively in the same machine under exactly uniform conditions, excepting that of speed, which was varied from 16 per minute up to 48 per minute, by changing the driving pulley of the rattler from smaller to larger sizes. The charges were weighed after running 1,000 revolutions and 2,000 revolutions, and also after forty minutes' running time, regardless of rate of revolution. The data, on being worked out, show clearly:

1. The losses per revolution are practically the same between 16 and 48 revolutions per minute, there being a very slight increase between low rates and high rates of speed.
2. That the losses on equal terms increase directly with the rate of revolution.
3. That between 24 and 36 revolutions per minute the rate of loss per revolution is practically uniform.

The work done to this point has shown very clearly the conditions as to machinery and operation which ought to prevail in making a standard test. To bring them clearly in order they are here summarized:

1. Not less than 10 per cent. nor more than 15 per cent. of the volume of the rattler need be filled with the cubic contents of the charge.
2. It must be rattled for not less than 1,000 and preferably for not less than 2,000 revolutions.
3. The length of the chamber is immaterial.

4. The diameter of the chamber must be between 26 and 30 inches.

5. The speed of revolution, between 24 and 36 revolutions per minute, is immaterial if the test is terminated when the requisite number of revolutions has been made.

Armed with this knowledge, the commission could have made a report recommending the standard tests. In order, however, to try in every possible way to conserve the interests of the brickmakers, and to avoid recommending any tests which would require them to furnish unnecessarily large quantities of material for tests, the experimental work of the rattler test was greatly extended.

It is plain that if the volume of a charge must be maintained at a fixed quantity, and that rattlers of somewhat large size must be employed to make the tests, that a great deal of material is going to be required to fill them. If this is to be all brick, the question arises whether it is possible to supply a standard brick for filling up the bulk of a charge and use a few only of the test brick which often must be shipped from a distance. Also the use of iron as a filling material has been proposed, and also granite and other stones. The first series of tests on this line of argument were to test the utility of iron as an abrasive or filling material. Accordingly, charges of five bricks each were weighed out and small foundry shot, no piece of which weighed above $1\frac{1}{2}$ pounds, and most of which did not exceed 8 ounces, was used to fill these charges up to a volume of 5, 10, 15, 20 and 25 per cent. The losses on rattling showed a slightly decreased rate as the charge increased in volume, but the losses of all charges were only very slight and insufficient to show the relative quality of the bricks. Next cast iron bricks, weighing about $7\frac{1}{4}$ pounds each, with rounded corners and edges, were used as a filling material in eight similar charges, two of each volume. The losses incident to their use were very severe and irregular—so much so that no idea could be had of the relative wear of the bricks. Besides breaking the bricks the cast iron broke the machines as well and was discontinued for that reason. Iron, therefore, in large or small pieces gave very unsatisfactory results as a filling material where the volume was maintained in the charge and only a few bricks employed in each test. Brick and stones were, therefore, the only available materials.

In order to obtain a more definite knowledge of the regularity of loss where all-brick charges of one kind of brick were employed, ten sets of charges, each of 10 per cent. volume, were rattled for 1,000 and 2,000 revolutions at a speed of 30 revolutions per minute in the 28x18 chamber. The tabulated losses showed a variation of about $4\frac{1}{2}$ per cent. from the lowest to the highest, or a variation of about 20 per cent. of the total average loss, 10 above and 10 below. The averages found in this test for 1,000 and 2,000 revolutions were accepted as the standard loss for this material under these conditions, and were used as a basis of comparison in all further tests. Having thus established what the standard brick ought to lose when tested by itself, and within what limit variations might be expected, the next matter was to test the results of substitution of brick with stone filling materials.

Accordingly, a quantity of three typical stones, a limestone, a granite and a sandstone, were obtained, and pieces were broken and chipped into condition so that they each weighed substantially the same as the bricks, and their general outline was a rectangular one, as similar to a brick as was possible. Duplicate charges of 10 per cent. volume of each of these stones were rattled to ascertain their characteristic rate of wear. Then mixed charges, consisting of three bricks and the rest of the volume supplied with stone, were rattled in triplicate. The results of this test were unexpected. The bricks did not show a regular behavior at all; but in a number of cases they lost less than when rattled brick on brick.

But, inasmuch as the cost of fresh square blocks of stone, of approximately uniform weight, would be in excess of that of vitrified brick, it is apparent that no economy would result from their use, even if the results were satisfactory, which they were not. To be able to effect a saving, therefore, we should have to use the stones repeatedly. To test the effect of this action, charges composed of the bricks as before, with the balance of the volume made up to 10 per cent. with rounded granite blocks, which had previously been rattled for not less than 2,000 revolutions. Seven such charges were tested, supplying a new block of granite when any of the old ones broke or wore down to less than 80 per cent. of the weight of one brick. The results, when marshalled into shape, show again very unexpected figures.

The losses were not only very erratic and irregular, but they were also very much higher on the average than those obtained with brick on brick, or brick on rough stones. The natural explanation of this is that the rounded granite becomes smooth and slippery and rolls readily, thus causing freer motion to the bricks and heavier blows.

The unsuitability of stones, either rough or smooth, either on grounds of economy or for its reliability and regularity of action, being proven, the only remaining point as to selection of a filling material which remained to be investigated was the use of a brick filler, to be kept in stock at the testing laboratory and used as occasion presented. To get at the effect of various fillers of this sort, nine samples of paving bricks and blocks of various quality, and two samples of building material, ordinarily soft burnt, were used. Charges of these standard bricks each were weighed out and filled to the standard volume with each of the new material and rattled under standard conditions. This was repeated three times in most cases and the results tabulated.

The results are very unsatisfactory, so far as showing the method to be suitable is concerned. They show some facts of which no adequate explanation has presented itself. But they do show that even where bricks of the same weight and substantially the same rattling value are used, that the results are very fluctuating and uncertain, and not in any way fit to be used as a standard method.

There remain a few considerations which have not yet been submitted to direct test. Among these are the effect of water on the rate of wear. In other words, would a dry brick wear better than a wet one, or vice versa? Also, the effect of size has not been fully investigated, although we know that a large brick does not suffer so much as a small one. Its loss in ounces is approximately the same, but the percentage loss is less.

The following experiments and conclusions from the St. Louis Testing Laboratory, executed by F. F. Harrington and presented by him personally, were brought before the commission in regard to the rattler test:

Standard Brick—Five hundred brick from Purington Brick Company, Galesburg, Ill., were selected for uniformity from one kiln and shipped to St. Louis.

Rattler—Diameter, 24 inches, length, 42 inches, provided with movable cross partition or diaphragm.

Experiment 1—To find the effect of volume of charge. Results showed maximum loss at 15 per cent. volume; less at either 10 or 20 per cent.

Experiment 2—Effect of length, by moving diaphragm and testing chambers from 12 to 39 inches. Results showed no difference due to length, and only such variations above and below the average as variations in brick and process occasion.

Experiment 3—Effect of speed. Charges of equal volume and in equal sized chambers were rattled at speeds from 20 to 40 revolutions per minute. The results showed, first, that the loss per revolution was substantially the same at all speeds tested, with a tendency to higher losses with higher speeds; that losses per minute vary directly with the speed.

Experiment 4—In all the work recorded in the first three experiments the rattling was done in stages, from 10 minutes, 25, 40, 60 and 80 minutes, and weighings made after each period. These losses were plotted in curves, calculating and plotting each loss as the gross loss from the beginning. This gave, of course, gradually ascending curves, the reverse of those in Series 2 of the University tests. These curves, conducted on other materials, have shown that each kind of brick shows a characteristic rate of wear, more or less rapid at first, and decreasing more or less as the process continues. These curves, therefore, conducted on the plan inaugurated by Mr. Harrington, become very important and delicate means of determining the nature of a brick, since they not only show its gross loss, but indicate what its tendencies will be when exposed to actual conditions.

Credit is due to Mr. Harrington as being the first to bring out and use this characteristic wear curve for paving brick.

Experiment 5—Effect of cast iron as an abrasive or filling material. The blocks of iron weighed six pounds each. The bricks were five in number, and ten blocks were added and rattled, no reference being made to maintaining a definite percentage of volume. Results—The losses of the bricks were irregular and fluctuating, and no characteristic curves could be drawn. The iron was condemned as an abrasive.

Experiment 6—Granite was tested by itself and its characteristic curves determined. Five varieties were used, and the losses were found to vary after eighty minutes' rattling by 33 per cent. of the highest and 50 per cent. of the lowest. Also, the granite in nearly all cases gave curves not comparing in regularity with those of bricks, as its coarser structure made its losses irregular. Stone was therefore abandoned.

Experiment 7—The size of the brick on its rate of wear was investigated. Half bricks and whole bricks were tested, showing less wear on the whole brick. Also, three sizes of bricks, or rather three thickness of brick, from the same bar of clay were tested. The bricks were $8 \times 3\frac{3}{4}$ in cross section and $3\frac{1}{2}$, 3 and $2\frac{1}{2}$, respectively, in thickness. The percentage losses were least on the heaviest brick, and greatest on the lightest brick. This clearly indicates that it is not fair to compute the loss on a brick absolutely without reference to its size, and that this ought to be computed on its surface rather than its cubic contents.

Experiment 8—The effect of overburning and underburning was also tested, showing in every case that overburnt bricks and underburnt bricks lost more than normally burnt bricks.

The experimental work done at Columbus and St. Louis was done absolutely independently and without communication; and inasmuch as every experiment made by both observers has shown identically the same results, the conclusions of both are certainly very greatly strengthened, and, in fact, can hardly be gainsaid.

The recommendation of Professor Orton on the method of making the rattler test were then taken up, discussed and amended, article by article, and finally accepted as a whole.

SPECIFICATIONS FOR THE STANDARD METHOD OF CONDUCTING THE RATTLER TEST ON PAVING BRICK.

THE ABSORPTION TEST.

The absorption test, originally assigned to Willard Beehan, was never completed by him, owing to his unfortunate loss of health. It was taken up, however, by Prof. H. A. Wheeler first, and later by Mr. Harrington and brought to a satisfactory conclusion.

The porosity of burnt clay wares is well known to be the best index of their degree of chemical combination or vitrification; and, as many instances of failure of bricks by freezing have occurred in the earlier stages of the paving brick industry, the test has been from the first a most important and serviceable one. In order to understand the conditions under which uniformity of absorption can be reasonably expected, the following tests were instituted by Mr. Harrington:

Experiment 1—To determine what treatment is necessary to get the bricks completely dry. A special oven, made of sheet iron and well insulated with asbestos, was built. It contained 120 bricks at

once and was heated by a Bunsen burner to a temperature ranging from 220 degrees to 240 degrees F. Ten sets of bricks, each made by a different firm, were placed in the drier, weighing them carefully to within one gram first, and then withdrawing them for reweighing at intervals of 6, 24, 48, 96 and 168 hours.

The results, when tabulated and reduced to a diagram, show that the water which is always found in burnt bricks, due probably to absorption from the atmosphere, cannot be expelled with a temperature above the boiling point of water. The water continues still to escape even to 168 hours, or one week, but in small amounts only after 48 hours have passed.

Experiment 2—Similar tests were next instituted on bricks which had been soaked for twenty-four hours previously; and, as bricks are received by the laboratory for test which have been exposed to rain and frost, it is plain that this test is only a fair comparison with such cases. Ten sets of bricks, two to a set, of different makes, were again dried after soaking. Conclusions are drawn from this series identical with those of Series 1. Water continued to evaporate after a week's heating, but forty-eight hours sufficed to get rid of nearly all of it.

Experiment 3—After having dried a series of bricks thoroughly, as indicated in the two preceding experiments, they were immersed in water, duplicates being taken in each case. They were weighed in one day, two days, three days, one week, two weeks, four, six, eight, twelve and twenty-four weeks. The results, when plotted on a curve diagram, show that the absorption of hard burnt bricks was low in each case, and also that it followed the same laws as regulate the drying of the bricks before soaking. While after nearly six months' soaking the entire series was still absorbing water, still the great bulk of the water was taken in every case in the first week, and generally in the first two or three days.

Experiment 4—In order to discover whether the rate of absorption is materially changed by exposing the interior of a brick to the action of water, a series of tests composed of whole bricks, half bricks, bricks with both ends broken off, leaving the middle section intact, and lastly small pieces from the center of bricks, obtained from the crushing or cross-breaking tests, were dried and soaked as before for a period of twenty-four weeks, with periodic weighings as before. The results of this exhaustive test clearly shows:

First—That broken bricks always absorb more water than whole ones for either long or short periods.

Second—That small pieces of brick from the interior are only satisfied after soaking for eight weeks.

Third—That small pieces absorb more proportionately than either half bricks or whole bricks of the same manufacture.

The results of this very admirable series of tests by Mr. Harrington show us the following points:

1. That to obtain accurate figures as to the absorption of any hard brick will require not less than four days' drying and eight weeks' soaking.

2. That only roughly approximate figures are obtained within time limits which would be short enough to make the figures useful for ordinary competitive tests of material for immediate use.

3. That only rattled bricks should be used for absorption test, as the absorptive power of the brick in use is certainly increased by its chipping and grinding under traffic.

4. A careful series of tests on bricks of the same sample sets was made by rattling, and a close comparison of the tabulated and plotted data was made. No connection between losses by rattling and percentages of absorption could be determined to exist. Bricks of high absorption are just as likely to show a good rattling test as a bad one inside the limits shown by this set of samples.

In the same connection, the results of a series of experiments made some time ago at the Ohio State University may be quoted.

A series of bodies was made, purposely varying them so as to secure a regular gradation of vitrification when burned at the same heat. These were burned and cooled, and after various physical measurements had been made they were finally rattled in a small ball mill. Their losses being duly recorded, they were soaked to complete saturation and their percentage of absorption determined. The results, when plotted, showed very beautifully that the loss by abrasion was directly proportioned to the gain by absorption; those gaining the greatest weight by soaking also lost the greatest amount by abrasion. The result is in direct accord with the well-known facts. Every paving brickmaker knows that if his brick are not burnt hard they will suffer not only by abrasion but by frost.

But the point which is to be drawn from Mr. Harrington's work, which will doubtless commend itself to all brickmakers and users, is that where bricks have been burnt hard enough to endure a satisfactory rattler test it is certain that they will not absorb water enough to cause their damage by frost. And since the absorption test, as ordinarily executed in the past, has been ridiculously incomplete and inefficient, and must be very greatly extended in duration and preliminary drying to even approximate the facts, it seems that the value of the test is hardly likely to repay one for its proper execution. The following recommendations were then taken up and discussed, and finally adopted.

SPECIFICATIONS FOR A STANDARD METHOD OF CONDUCTING AN ABSORPTION TEST ON PAVING BRICKS.

CROSS BREAKING.

The third subject to receive examination was that of structural strength. The tests usually applied in the investigation of this subject are cross breaking and crushing. None of the regularly appointed members of the commission had access to an accurate testing machine of sufficient capacity to crush a whole brick. And in the opinion of the commission it is essential that this shall be done

in order to get results of the most reliable sort. Hence no new work has been executed on this test, but a review of the data already in existence was made. In regard to the cross breaking test, Mr. Harrington, under the direction of Mr. M. L. Holman, the Water Commissioner of St. Louis, has made a most elaborate examination of the proper methods of cross breaking to give consistent and proper results.

THE MACHINE.

The machine used by Mr. Harrington was a hydraulic press designed by Mr. Holman, which was made the subject of very careful calibration before its results were considered as bearing on the point in view. It is too much to attempt to describe at this time, beyond stating that the pressure is applied from above by insensible stages, by a straight knife edge of rounded cross section, so that no cutting of the skin of the brick occurs at pressures necessary to break it. The lower knife edges which support the brick also were made the subject of special test, and were only finally determined after prolonged trials. The common, straight, sharp knife edges in use have an effect of concentrating strains on a brick which cause rupture along certain lines of stress and at lower pressures than the brick is really capable of sustaining when differently supported. After getting the machine under complete control so that its action was well understood and its tendencies corrected the cross breaking of a large number of samples of brick



GRANT DIBERT, Plittsburg, Pa.

was begun. Each sample consisted of ten bricks, and the average of these ten results was taken as being the structural strength of the material in question. Besides the average, the maximum and minimum were noted for each set of ten. The results are incorporated in the following table:

After tabulation of these data an attempt was made to find out the relation, if any, existing between the rattling tests and absorption tests of the same makes of bricks. No relationship could be found in either direction. Bricks of low structural strength often stood high rattling tests, and vice versa. Also, brick of the same make varied very greatly between extremes, so that an average often failed to give confidence as being really a characteristic figure for the material. Beyond question, cross breaking tests, conducted as carefully on as good machinery as above described do indicate something of the structural strength of bricks. But, also, bricks in actual use in street paving are almost never submitted to strains of this character, nor to that of crushing; and hence the data obtained, even if they were thought to be characteristic, would still fail to show fitness or unfitness for this use. The following recommendations were submitted by Mr. Harrington and adopted:

SPECIFICATIONS.

The next subject taken up for discussion was that of the tests of hardness and specific gravity. Mr. Harrington submitted data obtained from ten samples of paving bricks, showing a range in specific gravity from 2.19 up to 2.41, the majority falling between 2.25 and 2.35. The hardness of even fairly well burned paving brick

has been proven to lie very close to 6 in Moh's scale (— Feldspar), and it is not possible by any known process or treatment to enable them to attain a hardness of 7 (quartz), though they may considerably exceed 6. The comparatively small range, as measured in this scale (Moh's), and the impossibility at this time of suggesting or applying any other test for hardness, makes the value of the test seem doubtful. If the hardness is much below 6 it can be detected as quickly and as surely by other means and by the color of the ware. No attempt to obtain any clew to a relationship between specific gravity and rattling, or absorption, or cross breaking has proven successful. The heavier bricks, as a rule, are the better bricks, but not always. In view of these facts the following resolution was passed:

"Whereas, After careful consideration of all the data as to hardness and specific gravity accessible to the commission, no relationship between these qualities and those necessary for good paving brick can be shown to exist; therefore,

"Resolved, That the commission recommends that these tests be abandoned as unnecessary."

The commission then listened to a report from Professor Orton on the effect of the structure of paving materials on their power to withstand wear by impact or abrasion. The investigation of this matter had been authorized by the commission at its meeting in July, 1895, and the work had been begun soon after. The importance and value of the results obtained were fully recognized, but in the judgment of the commission the subject lay outside of the strict limits of its scope. According to the resolution which created it, its work was to discuss and recommend a standard method of making paving brick tests, and no authority is given to assign specific standards of quality or to recommend changes in the present systems of manufacture, even in the belief that they are furthering the cause of good paving. For this reason the commission refused to give the matter a place in its official report, while sanctioning the expenditure of any funds which had been used for this purpose and strongly recommending to the Association that it should hear and take action on the matter when presented separately. In the conclusion of its labors, the commission passed the following resolution:

"Whereas, The thanks of this commission are due to the Canton Brick Company, of Canton, O., who donated 4,000 brick for their use, and the Purington Paving Brick Company, of Galesburg, Ill., who donated 1,000 brick to the St. Louis Testing Laboratory for a similar purpose; and,

"Whereas, The labors of this commission have been very greatly assisted and the value of their conclusions very greatly enhanced by the help of Prof. H. A. Wheeler, of the Missouri Geological Survey, Mr. F. F. Harrington, of the St. Louis Testing Laboratory, Mr. M. L. Holman, director of the St. Louis Testing Laboratory and Water Commissioner of St. Louis, and Prof. J. B. Johnson, of Washington University; therefore, be it

"Resolved, That this commission recommends that the National Brick Manufacturers' Association shall extend its thanks to the gentlemen and firms above named for their valuable co-operation and aid." (Loud applause.)

Mr. Eudaly: I move that we accept and adopt the report offered by the commission through the Secretary.

Motion carried.

Secretary Randall: The next business in order will be the report of committees. The only other committee to report is the Committee on Resolutions.

Mr. Purington then read the report of the committee, which included the resolutions previously offered by Mr. Richardson.

REPORT OF COMMITTEE ON RESOLUTIONS.

Your Committee on Resolutions beg leave to submit the following as their report:

It has come to be generally understood that the report of the Committee on Resolutions shall be a short summing up of the work of the Convention, and that it shall be incorporated in our proceedings as an evidence that, while, in the main, we devote our time to the material interests of the clayworkers of the United States, we are not unmindful that there are other obligations to discharge. There are many of our members who, from various causes, have been unable to attend the sessions of this, our Eleventh Annual Convention, who take as deep an interest in the affairs of this Association as do those who have been fortunate enough to be present. We have no words in which to express our regrets for their enforced absence, and we feel that our loss has been far greater than theirs. There are four of our former associates, who have not been with us at this time, whose voices will never again be heard in our midst. Their names may be erased from our rolls of membership, but the tender memories of their lives and services can never be effaced from our hearts. The Hon. A. S. Blaffer, of New Orleans, was one of the earlier members of our organization; he had filled the offices of Corresponding Secretary and Vice President; he was a young man of unusual promise, and had occupied positions of honor and trust in his native State. In every sense of the word he was a true man. Can more be said of him? Capt. J. A. Boyd, of Chicago, was for a long time a member of our body, and rarely missed attending the annual meetings. He was of a quiet, unassuming nature; was an ex-officer of the volunteer army, with an enviable record, and was loved and respected by all who knew him. Another name added to the list of those who departed this life in 1896 was W. C. Bush, of Nashville, Tenn. Those of us who knew him best need not that we should place upon our records

"words of praise." He was a thorough gentleman, an honest man and an unusually useful member of the N. B. M. A. We shall never cease to regret that his earnest desire to meet us as a body in his own city can never be gratified. E. P. Kelly, of Rogers Ford, Pa., is the last of this unusually long list of members whose loss we are called upon to mourn. He had attended few of our annual gatherings, but had gained a place in our affections by his gentleness, earnestness and interest in the welfare of the fraternity. To the loved ones whose home ties were so closely connected with these dear friends and brothers, this Association tenders its loving sympathy.

Your committee recommends the adoptions of the following resolution:

"Resolved, That while we do not deem it necessary to inform the Buffalo members of our Association that we fully appreciate the success which has attended their efforts to make this a memorable week in the history of our organization, and while we are unwilling to concede that this appreciation can be expressed in words, we cannot go to our homes without placing upon our records a vote of thanks to each and every citizen of Buffalo who has in the slightest degree contributed to our comfort and happiness while here; where all seem to have united in carrying out a plan so elaborate and so perfect; where all the arrangements for our entertainment were made on such a gigantic scale, and these arrangements carried out down to the slightest detail with a perfection that excites our admiration. It is impossible for us to select names from the list of those who have so earnestly labored in our behalf. The ladies, the members of the Builders' Exchange, the local brick manufacturers, the city officials and daily press have seemed to vie with each other in their successful efforts to render our visit pleasant and profitable."

Your committee has given careful consideration to the resolutions offered by Mr. Richardson, and believe that their passage would be in direct line with the policy of progress so successfully inaugurated in Cleveland two years ago. They believe that the work now being done at Columbus, O., by the State University in the interests of the clayworkers of the United States will be productive of benefits and advantages which cannot be overestimated, and that no efforts should be spared on our parts to encourage, strengthen and support those who are doing so much in the interests of a higher, better and more practical education for our boys.

We, therefore, heartily recommend the adoption of the following resolutions:

(See resolutions, on page 130, offered by Mr. Richardson.)

We also recommend that 2,000 copies of the report of the commission on standard specifications and methods of testing paving brick be printed for use of members.

D. V. PURINGTON, Chairman.
WILLIAM S. M'CAY,
Committee.
W. H. HOAGLAND,
W. S. BOWEN,
W. G. TITCOMB.

Mr. Eggers: I move that the report of the committee be adopted.

Mr. Adams: In the second paragraph of the resolution which refers to the election of the committee by ballot I think it is obvious to all the gentlemen that the proper way to select this committee would be to place the matter in the hands of the President of the Association, and let him appoint them at his pleasure. This is wise for reasons not necessary to state. The gentlemen might be elected who would not be disposed to give the matter the time it requires or who might not be in full sympathy with the movement. I move that it be amended so that the Chairman be instructed and requested to appoint these four gentlemen at his convenience.

Mr. Purington: The committee will accept the amendment.

Mr. Adams: I move the adoption of the report as amended. Unanimously carried.

Captain Crafts: Before we adjourn, I have a word to say. I hope I may see you the coming year. At seventy-three years of age I have no confidence that I shall, but I want to say, "God bless you all." (Cheers and applause.)

Secretary Randall then read the following

LETTERS FROM ABSENT MEMBERS.

Marion, Ind., Feb. 1.

T. A. Randall, Secretary N. B. M. A., Tift House, Buffalo, N. Y.: Impossible to leave works at present. Express my regrets to and give the glad hand to everybody for me.

T. W. BUTTERWORTH.

North Cambridge, Mass., Feb. 1.

T. A. Randall, Esq., Secretary National Brick Manufacturers' Association, Tift House, Buffalo, N. Y.:

Dear Sir—I am very much disappointed at not being able to attend the Convention which meets to-morrow, but in consequence of the fact that the members of my firm are scattered throughout

different parts of the country and the business is left solely in my charge I cannot possibly leave. Kindly convey to the members present my best wishes and hearty godspeed in their deliberations, trusting that the material of friendship may be firmly cemented together by the members of our Association into a noble structure that shall outlive its individual parts.

It is a matter of keen regret to me, as well as to many others, that our Convention could not see its way clear to honor Boston this year, but I sincerely hope that the result of your present deliberations will result in bringing us all together here in convention assembled next year; and I can assure, personally, as well as on behalf of the New England members, that our Association shall never regret such action. I recollect with a great deal of pleasure my personal experience on the Boston committee which entertained the committee from Buffalo which attended the National Builders' Association in Boston, and I am assured that the gentlemen in Buffalo will do everything that hosts can do and that guests could expect. With renewed assurances of good will and wishes for a successful meeting, I am, yours very truly. JOHN E. PARRY.

New Orleans, Jan. 28.

My Dear Mr. Randall—It has been some time since I have had this pleasure, and shall hope that these lines may reach you and yours in good health and spirits. It was my intention to have been with you during the Convention at Buffalo, but the fearful cold weather South has made me change my mind. Would have been delighted to meet all the old boys once again, and hope this pleasure may be in store for me some other time.

Inclosed please find postoffice order for \$4, two for amount of inclosed bill and two for my membership in the N. B. M. A., and may you all have a pleasant and instructive reunion is my earnest wish. I have not run our works since my son's death, nor is there any immediate encouraging prospect for so doing. Business appears alike everywhere. Guess you are kept busy giving convention matters the final touch, hence will close with best wishes from, yours truly, J. A. BLAFFER.

T. A. Randall, Secretary N. B. M. A.:

Dear Friend—As I have written several articles advocating the establishment of a brick plant as an industrial school for brickmakers, and as these articles have been received with both approval and disapproval, both in and out of the Clay-Worker, it is fitting and proper that I should make a brief statement before the N. B. M. A. of my ideas and purpose of an industrial school for brickmakers.

First, I will say that I had no desire or intention of advocating a school for brickmakers that would in any way interfere or come in competition with the school of Professor Orton or any other school. I was not aware that any party or person had a monopoly for a school for teaching the art of brickmaking. As there never had been such a school, and as there is a great necessity for such schools, and as I was the first to suggest such schools (see pages 45, 51 and 89 of my book on "Brickmaking and Burning"), I thought that it was proper and really my duty to give out a practicable plan for a brickmakers' school, and I did so in my Clay-Worker article of November, 1896.

The plan and reasons therefor speak for themselves, and I have nothing to add, only to say that brickmakers are the only class of men in any of the arts or sciences that are entirely without any kind of school for a proper, intelligent or regular training of their craft. A respectable young man wrote to me not long ago to find out where he could go to learn the art of brickmaking. I could only tell him that to do that he must become a "tramp," visit most of the brickyards North and South, work in the best of them a short time, spend four or five years this way, then, if Professor Orton would take him and "polish him," he could start out as an expert brickmaker.

The chief difficulty in establishing a school for brickmakers is to supply the school with a full variety of clay. There are three

or four grades of fusible clays and two grades of infusible clays. Of course, the perfectly finished expert must know just how to handle each kind of clay. It won't do to have a testing furnace or kiln and a sample of clay, to show just what degree of heat every sample will stand; that is only good for the technology and chemistry of brickmaking. Nothing short of actual practice with the different kinds of clay will make a fully reliable brickmaker. Please read this letter to the Convention of the N. B. M. A. I in-



D. V. PURINGTON, Chicago, Ill.

vite discussion, and will expect a fair and proper consideration of this subject.

Hoping for a happy and profitable meeting of the N. B. M. A., I am very truly yours, J. W. CRARY, Sr.

Secretary Randall then read urgent invitations from the city of Nashville, Tenn., for the Association to hold its next Convention in that city, which were referred to the Executive Committee.

President Brush: Gentlemen, our labors are completed and this Convention is adjourned.



THE POWWOW.

A RECEPTION, A SMOKER, A BANQUET, ALL IN ONE—
HOW THE BUFFALO BUILDERS AND BRICK-
MAKERS ENTERTAIN THEIR VISITORS.

THE BUFFALO brand of hospitality was sampled by the members of the N. B. M. A. Tuesday evening, and from the many expressions of warm approval and appreciation heard on every side none of those who participated will ever miss an opportunity to again drink of the spirit of good-fellowship which seems a part of Buffalo nature. The very atmosphere of the "Bison" City is charged with it. When the visitors began to assemble in the Builders' Exchange at 8 o'clock Tuesday evening they found the room had been transformed into a combination music hall, cafe and audience room. There was music in the air, and it was of the infectious sort. The elderly, as well as the youthful members, were soon capering merrily, as they had not for years.

After an hour of social enjoyment, during which the visitors were frequently introduced to a stately attendant, who dispensed a seductive, ruby-colored liquid from a bottomless silver bowl, Mr. Henry Rumrill, Jr., the genial and masterful President of the Builders' Exchange, acting as Master of Ceremonies, rapped for order, bade the visitors a cordial welcome, and called upon Mr. Wm. H. Brush, the newly-elected President of the N. B. M. A., for a formal

WELCOME ADDRESS.

President Brush: Gentlemen, we are glad to see you here to-night and to see that you are apparently enjoying yourselves. Our brickmakers here this evening are the guests of the Builders' Exchange, between whom and the brickmakers there is a close relation, generally closest about the first of the month. (Laughter.) I do not think our builders and our brickmakers here are singing the tune I heard this afternoon in our meeting. Everybody called upon to speak seemed to have the longest kind of a mug on him and complained about hard, hard times. We do not think so here. We have our punch bowl in that corner, beer in that and lunch in that—all are free as the air you breathe. We want you to partake of it and be merry. We welcome you to our city, and we are going to try and make it pleasant for you. We will extend a glad hand of fellowship and we want you to shake it; and when you shake it we want you to have an impress made that we will all remember. I am a poor hand at speaking, nothing but a common builder and brickmaker, so you will excuse me. (Great applause, and song, "He's a Jolly Good Fellow.")

Toastmaster Rumrill: I am going to call upon one of the members of this National organization, one of our visitors in this city, who is known, as I understand, throughout the country as the brickmaker to the President. I do not know that you will recognize that name, but I call upon Mr. Jesse Adams, of Indianapolis.

Mr. Adams: Mr. President and Gentlemen—Coming up stairs I thought I had struck a hall of the Salvation Army, and when I entered the room I took it for the Midway Plaisance. (Laughter.) President Brush spoke of the good cheer he has for the visiting members, the warm heart and glad hand, and it is a very pleasant and satisfactory change from the frosty condition we have encountered the past season.

Continuing, Mr. Adams spoke as follows:

J. C. ADAMS'S ADDRESS.

Mr. Toastmaster and Gentlemen—Our business in common with many industries of the land has suffered greatly during the last three years. In fact, the building trades and every interest connected therewith have experienced a widespread depression and a general shrinkage of business, both in volume and in profit. The reason for this is obvious to all, for the manufacturer of brick is among the first to suffer by reason of unsettled conditions, dull times and panicky feelings, as he is the first to experience a revival of business, restoration of confidence and general prosperity.

It is not necessary for me to tell you what you already know, or to repeat what is current history; that the business men of this country have recently passed through the deep Red sea of a bitter and lasting experience; they have undergone a season of sore trial and grievous disappointment of business stagnation and commercial paralysis, which in point of severity has been unknown to this generation, while the trade and commerce of this country has been confined to the bare necessities of life. Penury and want have come in at the open door of many homes, which heretofore had been the abodes of comfort and contentment; while others, many of

whom are found among the brick manufacturers, have by the practice of frugality and self-denial laid by something for a rainy day, and that time which comes to us all, when by reason of the infirmities of years they will be unable to count a full hand as the bread-winner of the family. These are confronted with the certain knowledge that their assets have perceptibly shrunk and the earning power of their investments practically vanished. Under the stress of hard times food and raiment have the first call on the energies of the people. They can get along without a new house or better building, by patching up the leaky roof and making occasional repairs. The old home can be made habitable and to answer until the advent of better times. Instead of spreading out and enjoying the comforts that come with more room and pleasant surroundings people crowd together, and we find a number of families under one roof where heretofore but one has dwelt.

It is a well-known fact that the means with which people build houses and erect structures represent their savings and accumulations, or, having assurances of certain and regular profits and returns in their business, they are encouraged to mortgage their future efforts.

Another cause for the lesser demand for our products lies in the substitution of other material than brick in the building of houses, in iron and steel constructions, fire proof, hollow ware and tile for partition walls and floors, stoneware pipes used in building small sewers, stone and cement for sidewalks, in the making of which millions of brick have been used in the past. In these changed conditions we find some of the reasons which have reduced the demand for our product and caused our industry to languish. In



TOASTMASTER HENRY RUMRILL, JR., Pres. Buffalo Builders Exchange.

fact, my friends, the manufacturer of brick in this country is in the condition of a blind mule in a park; he does much traveling but little getting ahead. Let us hope that we will soon come to the turn of the road which will lead us to a more satisfactory business with a fair return for our labors and risks.

We certainly owe much to the brick manufacturers of Buffalo for their courteous invitation to hold the eleventh annual gathering of our Association in this great commercial emporium of western New York, with the added pleasure of spending a few days in your beautiful city, viewing its many interesting features and advantages of land and water and noting its wonderful growth in wealth, population and business improvements. To the stranger sojourning among you the traffic and transportation facilities and physical resources of your city are indeed a revelation of greatness, which comes to her by reason of her unequalled position as custodian of the gateway through which passes a large proportion of the trade of the continent.

Your cordial greeting and generous hospitality, which thus early has marked our stay among you, has awakened memories of the past and recalled the fact that some of us are sons of New York, and modestly claim a small portion of the heritage that comes to those who have gone out from the fields and hearthstones of this imperial commonwealth. While I am a resident of Indiana, I have not lost interest in a State which I once called home, and under whose sod lie buried my forefathers. I rejoice with her citizens in her colossal growth and the giant strides she has made towards developing those material interests, moral instincts and intellectual

forces which have placed her first among the sisterhood of States. I am with you, gentlemen, joint owner in the glorious memories of Saratoga, Ticonderoga, West Point and Tarrytown, made so by the heroic sacrifices and almost divinely inspired deeds of our common ancestors; the exalted character, brilliant achievements and illustrious deeds of your great men, your statesmen and your soldiers, authors, poets and men of letters and affairs, who have won imperishable renown in war and in peace, in art and in science, in statecraft and in literature, and in the benefactions they have conferred on our race. Their lives and characters stand for all that is best in manhood and most to be desired in this life—from that quaint old Dutch Governor, Peter Stuyvesant, with his wooden leg and corn-cob pipe, down to your present leaders of thought and action, representing the best thought, the loftiest sentiments and the most enlightened conscience of the people. Do not for a moment entertain the belief that he who, when a child, listened to the murmurings of the majestic Hudson, as it moved onward to the sea, and saw the light under a New York sky, will quit claim his interest in the patrimony that belongs to the sons and daughters of this great State because he now dwells in a distant section. The inroads of time, distance, nor changed surroundings can ever cause us to be unmindful of our birthright or forget the home of our boyhood days. There lingers in our breasts a sentiment of pride which the lapse of time cannot dim nor the environments of life efface that comes to those who have the great good fortune to claim the Empire State as their ancestral home. That man must have a marble heart and a sordid brain who does not look with



J. C. ALMENDINGER, Sec'y Buffalo Builders Exchange.

love and reverence on the State, community or spot which shelters the graves of his ancestors. Thousands of miles have separated us from these hallowed associations and these dear old New York homes; our heart strings had even been stretched, but they have never yielded to the tension. We may call this sentiment, but it is sentiment that gives sparkle to the eye, buoyancy to the heart and elasticity to the step. Show me a man who is devoid of sentiment and I will point to one in whom the milk of human kindness has turned to curd, and whose life is a whited sepulchre.

We have left these hills and valleys and blessed old firesides, many of us, with no legacy save a good name and the lessons of thrift, frugality and earnest effort which were taught us in these old New York homes by that mother and that father whose voices are now stilled and whose faces have long since vanished. The sons and daughters of this incomparable State who have gone out from among you have been inspired with that self-reliant spirit, that indomitable courage that grows as dangers multiply and difficulties increase, backed by that high purpose that knows no such word as fail, and which is characteristic of your citizens the world over. With such an ancestry, imbued with such a spirit, your descendants have, under the province of God, built in the Mississippi valley and the land beyond the greatest and most magnificent empire of free men, free thought and happy homes, resting on the concrete foundation of moral growth and religious instincts that the world has ever seen; a government of man for man, the grandest in its conception and most harmonious in all its parts that the mind of man has ever conceived, or the sun in its course has shone

down upon. By some we have been termed the "rowdy West," a cold, sordid and uncultured people. Permit me to say, my friends, such strictures and comments have not in the least disturbed our peace of mind or caused us much concern. Neither has the mistaken judgment of our fellow-countrymen made us falter in our purpose of developing our vast and illimitable resources, open our mines of mineral wealth and reservoirs of oil and natural gas, which brings sunshine to our homes and power to our machinery; cultivate and utilize our unmeasured agricultural wealth, which, when put to its test, will be equal to any call or demand made upon it by the breadless millions of the world, while our towns, cities and industrial centers resound to the inspiring music of jetting steam, the whirl of machinery, the roar of the furnaces of our many diversified and mighty industries; every enterprise which confidence and the inventive genius of man can project and credit and energy can promote, which contribute to the comfort, betterment and prosperity of our fellowmen, and the advanced civilization of the age is upheld, fostered and made available.

In our struggle for mastery we have held firmly to the belief that the stability and permanence of our institutions depend more largely upon the intelligence, liberal education and moral instincts of the masses than any other human agency. To that belief we have pinned faith, and made the church, schoolhouse and college the foundation upon which rests our present greatness and future hopes, never forgetting but always remembering that we are sons and daughters of New York and New England. (Loud applause.)

Toastmaster Rumrill: It is no wonder that ex-President Harrison said that Mr. Adams was the only one who could make bricks for his house. We have heard from the President-elect. I would like now, and I know all the other gentlemen would like, to hear from your ex-President, Mr. Morrison.

Mr. Morrison: Gentlemen—I am in a predicament to-night. My friend McMillan, down in Georgia, tells me, "Morrison, when you are serious you can talk so that we can sort of stand it, but when you attempt to be funny we can't stand it, and it won't do. Now, please don't try to be funny any more." I take it that this is not a place for anything very serious, and it won't do for me to try to be funny. So, like my Brother Gates would say, I am between Humpty Dumpty and the deep sea to-night. This evening Brother Gates, at the hotel, was somewhat out of humor about his room; he was a little angry, but finally got a room. I thought I would go up and console him, and went to the door and heard him talking to himself in there, and found he was rehearsing his speech for to-night. I got the refrain as nearly as I could; it was something like this: "If I should fail to reach that haven of rest where all good brickmakers go, I hope the proprietor will do his best and put me off at Buffalo." (Laughter.) We have heard a great many speeches about the hard times, and we do not want to hear anything more about that. We had better talk about some good times that we used to have or are going to have, or something of that kind. I want to tell you something that will make you feel good. We do not want in this country any red flag of anarchy; rather give us the black flag of industry which floats over a thousand smokestacks, let the great wheels whirl and hum the glad song of good times, bringing hope to the heart of the toiler, comfort to his wife and children, peace and happiness to his home and rest to the weary business man. Let this prosperity be widespread, not confined to any section or locality, but let it reach over the entire country, embracing all its citizens from ocean to ocean.

From Maine's dark pines and crags of snow
To where sweet magnolia breezes blow. (Applause.)

Toastmaster Rumrill: We will now hear from a representative of the Windy City, Mr. D. V. Purington.

Mr. Purington: At Atlanta I made up my mind in going there among the Southern orators that I did not dare trust myself to speak extemporaneously, and wrote what I had to say and read it. I feel very much more at home to-night. This is a sort of crowd for whom I don't need to write anything down exactly. You heard that wonderful story of Gates. We have heard nothing but hard times at this Convention. If these are hard times I want more of them—feed them right into me. Your Chairman has introduced me as a representative of the Windy City. Now, the prevailing winds in this part of the country, and it extends a good way west of it, are westerly winds, and you have as much wind in Buffalo as we have in Chicago, and, in fact, there are many things in common between the two cities. In the old days nearly all the old residents of Chicago, whether they came from Europe, or New York, or Pennsylvania, or New England, as they were going West to seek their fortune went by the way of Buffalo. They were not put off at Buffalo, but were put on a sailing vessel and went around the lakes. Buffalo and Chicago are the two extremities of the largest and most extensive grain transportation in the world. We receive it there and ship it to you, and you distribute it elsewhere. This statement has been made in the public press—that the tonnage of our lake transportation exceeds all of our ocean transportation in America. That I presume is true. And when you remember that one end of the line of transportation is Chicago and the other end is Buffalo you have the connection between these two cities complete. We have the elevators there and you have them here. We have the brickmakers there, more than you have here, but to-night you have more of them here, that is true. Unfortunately our representation from Chicago is smaller than we are entitled to. I lived in Chicago some twenty-six years ago when we were the

victims of that great conflagration which has become known as the great Chicago fire. Down South they date everything from the war. In Chicago we date everything from the fire. No Chicago man living who was at Chicago at that time has forgotten the liberality and generosity of the people of Buffalo when we needed generosity and help. (Applause.) We shall always remember that from the city of Buffalo came our first substantial relief. Cars were loaded here and immediately sent there, and we have never forgotten it and never shall, and the way in which you are treating us to-night is on a line with the generous hearts of which we know the people of Buffalo are possessed. (Applause.) There is another connection between Buffalo and Chicago. In the year 1894 Chicago knew what riot was. She knew what anarchy was, and we were practically at death's door for weeks, hardly knowing what the day might bring forth; and we shall never forget that it was a former citizen of Buffalo who saved our city from destruction and preserved this country at that time. (Cheers for Cleveland.) I can hardly convey to you an idea of the fear and trembling in which we lived. I wish I could make a speech like Brother Adams, but you must remember, in the first place, that Adams is an older man than I, and he has been in public life a great while and became accustomed to public speaking, especially before such an audience as is here to-night. I only wish I could entertain you and talk to you as Jesse Adams can, but there are others who are here to follow me and I must give way. (Applause.)

Toastmaster Rumrill: Gentlemen, if you will pardon the liberty I take I would like to propose a toast. It was given in Boston, I think, at the conclave there several years ago, and, with your permission, I will give it to you. It is a toast to the world:

We enter it naked and bare;
We go through it with trouble and care;
When we leave it we go we know not where,
But if we're thoroughbreds here we're thoroughbreds there. (Applause.)

Toastmaster Rumrill: I am going to call upon Mr. Frank Stiles.

Mr. Stiles: I do not know if this is the time to be serious—we have been talking about the old, old story—but we are here to-night to enjoy ourselves and all seem to be having a pleasant time. I can say that I am proud of my fellow-craftsmen. If you are going to applaud at all now is the time; that is the best compliment I can give you. (Applause.) My father commenced making bricks when they had oxen and a treadmill. I was born a brickmaker, and in those days they had to work hard and toil early and late, and while it was an honorable occupation, the people who made brick were poor but honest.

Gentlemen, as I came before this audience to-day and saw the people who were manufacturing brick all over our country, I felt the same feeling which I have felt on former occasions, when I have met with you, I have been proud of my vocation. Mr. Gates referred, in his remarks, to the importance of our industries, that we furnish employment to so many men whose families are dependent upon us, and he spoke of the good times which are to come. I hope when we leave this Convention we will go home feeling that good times are at hand. I do not think they will come within a few weeks, possibly not for several months, but I look forward to a good, prosperous year, and more prosperous years to follow. If we take encouragement and go on and improve our machinery—that is one for the machinery men—and make the best brick possible and put them on the different markets I think, without doubt, next year we will come to the Convention feeling richer, happier and better than we do this year. (Applause.)

Toastmaster Rumrill: I think the rest of the gentlemen will bear me out, and insist on having a story by Mr. Richardson, of Cleveland.

Mr. Richardson: I have never told a story in my life, but I must acknowledge the compliment you have paid me in calling on me to speak after so many gentlemen have entertained you this evening. The occasions such as we have to-night are the pleasantest in the whole year to me, and the warm greeting that I get from my friends in the Association is something I look forward to many days before coming here. As I look over this audience and see so many men who are good looking and intelligent, I can say, with Brother Stiles, I am proud that our Association has connected with it such men. I know there are other gentlemen who will entertain you more acceptably, and for that reason I will not detain you. (Applause.)

Toastmaster Rumrill: I have numerous requests here to call upon Mr. Eudaly.

Mr. Eudaly: I presume I am expected to tell a story. Now, the fact is, gentlemen, as you all well know, I am rather a timid man. I am not accustomed to speaking in public. I have picked up a little here and there by attending the meetings of this Association. Still, with all that, the courage required has not been sufficiently developed within me to tell a good story as I should. I am told I can get courage in the corner; but I have always understood a corner to mean a quiet place, and for that reason I have not been

in a corner. I have been trained by Mr. Purington, Mr. Gates, Prof. Orton, Brother Adams, in whose town, by the way, I have the distinguished honor of having been born, yet with all this I have not received that glibness of tongue and personal effrontery which is necessary to tell a good story. There are some things men acquire very readily. Some men have a way of picking up these delightful little things with very few rehearsals, but for my part I have been slow to gather. I have heard these same stories, many of them, for the last eleven years. (Laughter.) I have tried to rehearse them, but I have never arrived at that degree of perfection which enables one to entertain a crowd of gentlemen. Brother Stiles was not known to make a speech until about a year ago, and yet it was whispered year after year that he would develop, and sooner or later come to the front and acquit himself as his trainers had hoped he would from the beginning. Now, I have been given up as a hopeless case, but I want to say to you, brethren, and especially those who recently joined this Association, that there are at least ten or fifteen gentlemen in training for storytellers on occasions like this, of whom the trainers expect great things. I believe they are to be graduated about one or two a year. Stiles came on this time—well, there are others. Adams, you saw what he did to-night. I remember when Jesse Adams could not tell us anything but about his being the first brickmaker, or his father, rather, in Philadelphia. When he got into politics and began to make campaign speeches he developed rather fast, perhaps, and went a little further than some of us would like.

Now, gentlemen, you seem to be in a serious mood and inclined to listen, and I want to say that of all the things in the world I am proud of—I am proud of being among those who first conceived the idea of this great organization. (Applause.) I believe, gentlemen, that this organization has done more for its country than many of us give it credit for. I believe that this organization will do more for this country than many of us have any conception of its being able to do. We often complain because the country at large is not as well represented at these meetings as it should be, but do you know that the work that has been done at these eleven meetings has done more to elevate the clayworker and the clayworkers' ideas and respect for his business than any other thing that was ever brought together in these United States? (Applause.) I want to say to you another thing, gentlemen, and I do it with deliberation, and with no intention of giving taffy or anything of that sort—do you know that there is not another such trades organization in the United States which is so fairly represented by the trades journals connected with that organization? (Applause.) That is a fact. I believe that to be true. And for this reason, that this organization is able to cast an influence over this country that no other is able to do. These are facts. Since this organization began, its reports have not ceased to be published throughout the entire length and breadth of this country and of foreign countries. The discussions at our conventions are read by thousands all over this country. They are to-day in the homes of the brickmakers of these United States and Canada and other countries. There are men and women, and boys and girls who are looking forward with great anticipation of enjoyment to the time when they will get the report of the work we will do to-morrow and next day in this Convention. This being the case, we have a great responsibility. We are at no child's play. We are shaping the course of the thoughts of the improvers of this country. We are shaping the course of the thoughts of the men who invest their dollars and cents in the real estate of this broad land. The permanency of the materials that we represent is, perhaps, the strongest inducement that capital has to-day in the cities of this Nation to invest in real estate. You no longer hear it said that architectural terra cotta is not durable. You do not hear it said any longer that mortar will not stick to good brick. You do not hear it said any longer that mortar will not stick to a dry-pressed brick. These conditions are passed away, and men have learned to know, and know for a fact, that materials made from clay are the best, most durable, cheapest and most beautiful of all other materials. (Applause.)

Songs, toasts, stories and music followed each address, with an occasional "recess" for refreshments. One of the hits of the evening was made by the "Vaseline Quartet," composed of George Chandler, Indianapolis, Ind.; C. McDermot, Wellington, O.; Wm. Simpson, Chicago, and W. N. Durbin, Anderson, Ind. Under the direction of Secretary Randall (coached by Albert Potts) they sang "Put Me Off at Buffalo" as it was never sung before.

Mr. U. J. Matson, Falls Creek, Pa., and a quartet of Buffalo brickmakers, headed by Warren H. Brush, also favored the assembly with vocal selections. Mr. O. J. Swegles proved a capital story teller, as did his fellow-townsmen, Mr. Grattan, while Captain Crafts developed unsuspected talents in the same line, as did also Messrs. Potter, Springfield, Mass.; Di-
bert, Pittsburg, Pa.; W. R. Cunningham, Frankfort, Ind., and Secretary Randall, who, as musical director, much resembles Mr. Sousa both in appearance and method. It was after midnight when, under his direction, the entire congregation joined in the following song, and Buffalo's never-to-be-forgotten Pow-wow was ended, despite the protests of Toastmaster Rumrill and his gifted lieutenant, Secretary Ahmendinger, who insisted

that the fun had only just begun, and that it was entirely too early to adjourn:

ALL TOGETHER.

(To the Tune of "Auld Lang Syne.")

Our Business Meeting is o'er at last,
Our time is free for mirth;
We'll chase with joy the hours past,
To-night we own the earth.
The earth is ours a little while,
All free from thought or care;
With friends to-night "we'll gently smile"
And troubles fling in air.

A rousing song we'll sing to-night,
Our spirits all to cheer,
And help Old Time in onward flight,
To speed the coming year;
That in the coming year, for all,

The mem'ry of to-night
May ever pleasant thought recall
And make the days more bright.

Away with care! to-night we're free!
Let every one forget
That such a thing as care can be;
For pleasure we are met.
To-morrow will too soon be here,
With all its duties stern;
We'll make the most of all good cheer,
Before the day's return.

Whene'er, perchance, in other times,
We may this night recall,
In distant places, other climes,
The thought may come to all:
We here found friends that bring to mind
The old familiar line,
"Should auld acquaintance be forgot
And days of Auld Lang Syne?"

LIST OF MEMBERS N. B. M: A., 1897.

EXECUTIVE COMMITTEE.

1897.

President—WM. H. BRUSH, Buffalo, N. Y.
First V. P.—EDWARD ORTON, Jr., Columbus, O.
Second V. P.—EDWIN BROCKWAY, Fishkill-on-Hudson, N. Y.
Third V. P.—GEO. T. DICKOVER, Wilkesbarre, Pa.
Secretary—T. A. RANDALL, Indianapolis, Ind.
Treasurer—JOHN W. SIBLEY, Birmingham, Ala.

EX-PRESIDENTS.

W. A. EUDALY (1886), Cincinnati, O.
D. V. PURINGTON (1887), Chicago, Ill.
T. B. McAVOY (1888-89), Philadelphia, Pa.
J. C. ADAMS (1890-91), Indianapolis, Ind.
C. B. PEARSON (1892), Washington, D. C.
ANTHONY ITTNER (1893), St. Louis, Mo.
W. H. ALSIP (1894), Chicago, Ill.
F. H. EGGERS (1895), Cleveland, O.
R. B. MORRISON (1896), Rome, Ga.

LIST OF MEMBERS.

W. D. Palmer, Atlanta, Ga.
W. E. McCoy, Augusta, Ga.
Woolley Foundry and Machine Works, Anderson, Ind.
Anderson Foundry and Machine Works, Anderson, Ind.
I. W. Pike, Asbury Park, N. J.
Newton & Co. (Incorporated), Albany, N. Y.
Chas. T. Harris, Alfred Center, N. Y.
H. B. Manton, Akron, O.
W. H. Carter, Appleton, Wis.
John W. Sibley, Birmingham, Ala.
W. F. Tallman, Beamsville, Can.
M. E. Jacobs, Berlin, Conn.
Elliott S. Morse, Berlin, Conn.
J. W. Crary, Sr., Bluff Springs, Fla.
Geo. H. Drew, Blue Island, Ill.
Wm. Garig, Baton Rouge, La.
Chas. H. Classen, Baltimore, Md.
F. & A. Wehr, Baltimore, Md.
Geo. M. Fiske, Boston, Mass.
Geo. C. Hicks, Boston, Mass.
Rogers & Manson, Boston, Mass.
Alfred Yates, Boston, Mass.
Jasper Adams, Battle Creek, Mich.
W. C. Ogden, Binghamton, N. Y.
S. C. Brush, Buffalo, N. Y.
Wm. H. Brush, Buffalo, N. Y.
Frederick W. Haake, Buffalo, N. Y.
Lewis Kirkover, Buffalo, N. Y.
Geo. W. Schmidt, Buffalo, N. Y.
John V. Van Pelt, Brooklyn, N. Y.
Hector McLean, Bridgetown, N. S.
Geo. H. Bruns, Brecon, O.
Lewis P. Battfeld, Bucyrus, O.

W. W. Reehl, Bucyrus, O.
D. V. Purington, Chicago, Ill.
W. D. Gates, Chicago, Ill.
Wm. Simpson, Chicago, Ill.
B. C. White, Chicago, Ill.
Lewis Riemer, Chicago, Ill.
P. L. Simpson, Chicago, Ill.
S. S. Kimbell, Chicago, Ill.
Geo. H. Hartwell, Chicago, Ill.
Geo. B. Engle, Jr., Chicago, Ill.
H. J. Flood, Chicago, Ill.
J. E. Eastes, Chicago, Ill.
S. S. Chisholm, Chicago, Ill.
Geo. J. M. Ashby, Chicago, Ill.
Herman Thurow, Chicago, Ill.
Tiffany Enameled Brick Company, Chicago, Ill.
Wolff Dryer Company, Chicago, Ill.
Geo. J. Walter, Chatsworth, Ill.
E. M. Pike, Chenoa, Ill.
H. B. Skeele, Chicago Heights, Ill.
W. H. Hoagland, Cayuga, Ind.
I. C. Wheeler, Carthage, Mo.
Hervey Haigh, Catskill, N. Y.
Robt. Twells, Catskill, N. Y.
M. E. Gregory, Corning, N. Y.
W. E. Keplinger, Canton, O.
W. A. Eudaly, Cincinnati, O.
Atlas Bolt and Screw Co., Cleveland, O.
F. H. Eggers, Cleveland, O.
J. W. Hornsey, Cleveland, O.
Herbert E. Stone, Cleveland, O.
Edward Orton, Jr., Columbus, O.
L. J. Kilbourne, Columbus, O.
C. W. Vaughn, Cuyahoga Falls, O.
Chas. P. Speers, Charleroi, Pa.
G. A. Guignard, Columbia, S. C.
C. W. Williams, Cameron, Tex.
M. J. Hynes, Deseronto, Can.
John McCain, Denver, Col.
D. H. Haeger, Dundee, Ill.
Wm. E. McKinney, DeWitt, Ia.
A. H. Schmittiel, Detroit, Mich.
Walter E. Hilton, Dunkirk, N. Y.
John Hilton, Dunkirk, N. Y.
C. W. Raymond & Co., Dayton, O.
C. G. Reese, Elizabethtown, Pa.
Selden Brick Co., Erie, Pa.
George H. Morton, Erie, Pa.
Wallace Manufacturing Co., Frankfort, Ind.
Ft. Dodge Clay Works, Ft. Dodge, Ia.
T. C. Lundy, Farmington, N. Y.
Edwin Brockway, Fishkill-on-Hudson, N. Y.
Edgar A. Poe, Fayetteville, N. C.
Franklin Paving Brick Co., Franklin, Pa.
U. J. Matson, Falls Creek, Pa.
Andrew Harrington (Frost Mfg. Co.), Galesburg, Ill.
W. S. Purington, Galesburg, Ill.
M. M. Smlth, Galesburg, Ill.
A. R. Batley, Griffin, Ill.
S. H. McHose, Grinnell, Ia.

George N. Dyer, Gardner, Mass.
C. C. Dyer, Greenfield, Mass.
D. P. DeLong, Glens Falls, N. Y.
Wm. Finnegan, Green Bay, Wis.
Kleymeyer & Klute, Henderson, Ky.
Chas. Bray, Helena, Mont.
R. G. Eisenhart, Horseheads, N. Y.
Preston Brick Co., Hornellsville, N. Y.
F. R. Carter, High Cliff, Wis.
T. A. Randall & Co., Indianapolis, Ind.
C. & A. Potts & Co., Indianapolis, Ind.
W. P. Hussey, Indianapolis, Ind.
Chandler & Taylor Co., Indianapolis, Ind.
J. C. Adams, Indianapolis, Ind.
Robert Elliott (Standard Dry Kiln Co.), Indianapolis, Ind.
J. E. Mecusker, Jamestown, N. Y.
C. A. Morley & Sons, Jamestown, N. Y.
H. O. Whitney, Keokuk, Ia.
J. M. Leach, Kokomo, Ind.
E. W. Thornburn, Kingston, Jamaica.
J. W. Barney, Kansas City, Mo.
J. W. Carson, La Prairie, P. Q., Can.
LaSalle Pressed Brick Co., LaSalle, Ill.
George T. Howe, Leeds Junction, Me.
L. Warstler, Louisville, O.
Henry Martin Brick Machine Mfg. Co., Lancaster, Pa.
J. S. McCannell, Milton, Ont., Can.
Jas. W. Tester, Montreal, Can.
J. W. McMillan, Milledgeville, Ga.
Isaac Hardy, Momence, Ill.
F. T. Melcher, Marion, Ind.
Carl F. Kaul, Madison, Neb.
R. E. Farnham, Metuchen, N. J.
Martin L. Griffin, Mechanicsville, N. Y.
Mechanicsville Brick Co., Mechanicsville, N. Y.
Marion Steam Shovel Co., Marion, O.
David Stephens, Madison, Wis.
Ferdinand Vogt, Milwaukee, Wis.
M. H. Donnelly, New Britain, Conn.
Frank L. Stiles, New Haven, Conn.
S. P. Crafts, New Haven, Conn.
Ezra D. Fogg, New Haven, Conn.
J. Wheaton Stone, New Haven, Conn.
H. J. Wiley, New Haven, Conn.
J. A. Blaffer, New Orleans, La.
Parry Bros., North Cambridge, Mass.
Chas. A. Bloomfield, New York City, N. Y.
F. H. S. Morrison, New York City, N. Y.
Robin Main, New York City, N. Y.
Heinrich Ries, New York City, N. Y.
Pfothhauer & Nesbit, New York City, N. Y.
Orrin D. Person, New York City, N. Y.
Raymond Penfield, New York City, N. Y.
A. W. E. Hellyer, Ottawa, Can.
W. S. Odell, Ottawa, Can.
J. M. Powell, Orestes, Ind.
C. H. Leathe, Otter River, Mass.
Cyrus Chambers, Jr., Overbrooke, Pa.
R. C. Brown, Oshkosh, Wis.
A. J. Brooker, Porter, Ind.
Robert Nesch, Pittsburg, Kan.

James Taylor, Port Monmouth, N. J.
 Henry R. Griffen, Phoenixville, Pa.
 Frank B. McAvoy, Pawling P. O., Pa.
 Wm. Conway, Philadelphia, Pa.
 J. H. Chambers, Philadelphia, Pa.
 T. B. McAvoy, Philadelphia, Pa.
 Wm. McCay, Philadelphia, Pa.
 E. Webster, Philadelphia, Pa.
 Wm. Waplington, Philadelphia, Pa.
 D. C. Cawley, Pittsburg, Pa.
 Grant Dibert, Pittsburg, Pa.
 A. A. Hersperger, Pittsburg, Pa.
 W. N. Hersperger, Pittsburg, Pa.
 Phillips & McLaren, Pittsburg, Pa.
 Xavier Wittmer, Pittsburg, Pa.
 W. G. Titcomb, Providence, R. I.
 H. W. Gerke, Quincy, Ill.
 R. B. Morrison, Rome, Ga.
 W. H. H. Roger, Rochester, N. Y.
 H. L. Boas, Reading, Pa.
 I. T. Ebert, Ralston, Pa.

C. S. Green, Ralston, Pa.
 Henry Hasbrouck, Ralston, Pa.
 W. S. Ravenscroft, Ridgway, Pa.
 D. G. Loomis, Sherbrooke, P. Q., Can.
 W. C. Trotter, St. John, Can.
 Jas. A. Francis, Shamokin, Pa.
 C. J. Holman, Sergeant Bluff, Ia.
 Lewis Oliff, Shreveport, La.
 F. Salmen, Slidell, La.
 Jas. A. Gray, Saco, Me.
 D. J. Curtis, Springfield, Mass.
 T. D. Potter, Springfield, Mass.
 Anthony Ittner, St. Louis, Mo.
 F. W. Steinkamper, St. Louis, Mo.
 M. F. Williams, St. Louis, Mo.
 Jas. L. Breed, Syracuse, N. Y.
 H. J. Baldwin, Syracuse, N. Y.
 Chas. H. Merrick, Syracuse, N. Y.
 F. S. Naugle, Syracuse, N. Y.
 Geo. J. Fickes, Steubenville, O.
 W. D. Richardson, Shawnee, O.

Geo. F. Cotton, Table Rock, Ark.
 E. E. Gorton, Terra Cotta, Ill.
 H. Brewer & Co., Tecumseh, Mich.
 Walter S. Bowen, Tacoma, Wash.
 J. Edson Clapp, Vicksburg, Mich.
 W. A. Leary, Washington, D. C.
 John Miller, Washington, D. C.
 W. A. Richards, Washington, D. C.
 W. H. West & Bro., Washington, D. C.
 Jas. B. Crowell, Walukill, N. Y.
 Watertown Pressed Brick Co., Watertown, Wis.
 C. McDermott, Wellington, O.
 A. Thomas, Wickliffe, O.
 Geo. T. Dickover, Wilkesbarre, Pa.
 Geo. B. Waite, Wilkesbarre, Pa.
 A. R. Root, Wilkesbarre, Pa.
 A. D. Sharples, West Chester, Pa.
 Warren Brick Co., Warren, Pa.
 J. P. Norton, York Corner, Me.
 Zeeland Brick Co., Zeeland, Mich.

ROLL OF HONOR.

The great success of the Eleventh Annual Convention of the N. B. M. A. from a social point of view is due to the untiring efforts of the following Buffaloniens each of whom will ever be held in fond remembrance by every visitor, particularly the visiting ladies who request this acknowledgment.

LOCAL ENTERTAINMENT COMMITTEES.

Executive and Reception Committee—Wm. H. Brush, Chairman; Alfred Lyth, Vice Chairman; A. A. Berrick, Treasurer; O. J. Swegles, Secretary; Geo. W. Schmidt, Wm. Grapp, Henry Rumrill, Jr., J. C. Almendinger, Henry Dietschler, Jr., Louis Kirkover, Geo. W. Carter, J. F. Stengel, John Riesterer.

Excursion—Henry Rumrill, Jr., Chairman, President Builders' Exchange; O. J. Swegles, J. C. Almendinger.

Badges, Printing and Theater—J. C. Almendinger, Chairman, Secretary Builders' Exchange; Louis Kirkover, Henry Dietschler, Jr.

Ladies' Reception and Carriage—Geo. W. Carter, Chairman; A. A. Berrick, J. H. Black, Oliver A. Jenkins, F. E. Tanner.

Committee of Ladies to Entertain Visiting Ladies—Mrs. Warren Brush, Chairman; Mrs. A. A. Berrick, Secretary; Mrs. Wm. Brush, Mrs. S. C. Brush, Mrs. J. F. Stengel, Mrs. O. J. Swegles, Mrs. H. T. Newton, Mrs. Alfred Lyth, Miss Emma Schmidt, Mrs. W. C. Brush, Mrs. George W. Carter, Mrs. F. E. Tanner, Mrs. C. A. Rupp, Mrs. George W. Schmidt, Miss Ella J. Schlund, Miss Louisa Schmidt, Miss Etta Dietschler.



FRIDAY AT THE FALLS.

The excursion to Niagara Falls on Friday was a fitting climax to the week's entertainment, so thoughtfully planned and carefully carried out by the local committees. At 10:30 a. m. all hands boarded a special train chartered for the occasion and steamed merrily away. It was a jolly crowd and the ride was an enjoyable one. Arriving at the Falls, the party was divided in two sections, one making the trip down the gorge road on the trolley line and the other going on the steam cars to Lewiston, where the order was reversed, and those who had gone down one returned the other, so that all were given an opportunity to view the beautiful scenery by both routes.

Returning to Niagara at 2 p. m., the entire party was ready to do justice to the complimentary dinner served at the Imperial and Tower Hotels. It was a veritable feast. After it was thoroughly discussed guests and hosts alike separated into small sleighing parties, visiting the principal points of interest. All were provided with free tickets to the Tower, a modern observatory equipped with elevators which quickly carry one up to a height of nearly 300 feet, from which was obtained a magnificent view of the surrounding country.

The day seemed very short as at 5:30 we again boarded the train and returned to Buffalo, where we landed on time very tired, very happy and with hearts full of gratitude to those who had made our brief holiday so pleasant.

THE MACHINERY ANNEX.

THE EXHIBITION ROOMS at Buffalo were well patronized, as usual. The most attractive display was that of the American Terra Cotta and Ceramic Company, Chicago, of which the accompanying illustration gives an inadequate idea, the upper, or finishing, course, a beautiful cap, being lost almost entirely in the picture. To those not familiar with this branch of clay work the display was a revelation, and to such it was necessary to explain that this was not intended merely as a bit of ornamental work, such as an occasional panel or dado, but that entire fronts of great commercial structures are now built of this glazed or enameled terra cotta.

The exhibit was arranged by E. E. Gorton, who, by the by, is a graduate of Professor Orton's School of Ceramics, and now has charge of the enameling department of the A. T. C. and C. Co.'s works, and was arranged with a view of indicating the color possibilities in this line, which are particularly unlimited. The lower course was of unglazed ware, in conventional reds, browns and buffs, the upper courses being of glazed blocks in all colors.

Another exhibit that called for more than passing notice was made by the Chambers Bros. Company, Philadelphia, and consisted of a handsome panel of red Philadelphia stretchers, made on the Chambers machine, and a number of specimen brick, including some of the famous Staffordshire blue brick from England. They also showed a small model of their latest dry pan and a series of photos of their other machinery, each neatly framed.

The only life-size machine exhibited was one of M. F. Williams's clay pulverizers. It was too large to be taken up to the exhibition room, so was placed near the entrance to the elevator, where it was left unguarded throughout the week.

The American Clayworking Machinery Company, Bucyrus, O., showed a large model of their dry press and a varied assortment of pressed and ornamental brick.

The Wellington (O.) Machine Company exhibited a model of their Monarch soft clay brick machine.

The Tiffany Pressed Brick Company, Chicago, was represented by Mr. I. H. Hardy, Jr., who displayed some excellent specimens of enameled brick, tile and terra cotta.

The Ohio Ceramic Engineering Co., Cleveland, showed a line of thermometers for use in the early stages of firing kilns of brick or pottery, which they can furnish at a comparatively moderate price.

The Simpson Brick Press Company, Chicago, had a fine line of pressed and ornamental brick, contributed by users of their presses.

The balance of the "push," who were content to display their catalogues and circulars, included:

The Chicago Brick Machinery Company, Chicago.

C. and A. Potts & Co., Indianapolis.

W. A. Eudaly, Cincinnati.

The Eastern Machinery Company, New Haven, Conn.

The Standard Dry Kiln Company, Indianapolis.

The Frost Manufacturing Company, Galesburg, Ill.

The Woolley Foundry and Machine Works, Anderson, Ind.

Anderson Foundry and Machine Works, Anderson, Ind.

The Henry Martin Brick Machinery Mfg. Co., Lancaster, Pa.

The Cummer Drier Company, Cleveland.



The Wallace Manufacturing Company, Frankfort, Ind.

C. W. Raymond & Co., Dayton, O.

Williams, White & Co., Moline, Ill.

Chandler & Taylor Company, Indianapolis.

James B. Crowell, Walkill, N. Y.

A BROAD-MINDED VIEW.

Publishers Clay-Worker:

Gentlemen—Inclosed please find the sum of \$2, which you will kindly place to my credit. While not at the present time identified with the manufacture of brick, feel convinced that I cannot afford to be without the Clay-Worker. I find that the articles published from time to time in your journal are not only particularly fitted to the brick manufacturing interest, but the knowledge therein can be very successfully applied to many other manufacturing concerns. Wishing you a Happy New Year and continued prosperity, yours truly,

New Orleans, La., Jan. 29.

V. SCHIEHR, M. E.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Pleasant Convention Memories.

My Dear Mr. Randall:

Having arrived home safe and sound, I am still enjoying in retrospect the most agreeable week spent with the brickmakers at the Buffalo Convention, and I cannot but congratulate them, through you, on its success. I have been present at many such gatherings, political and business, but I have never attended one where the arrangements were so perfect for the transaction of the usual business and for the comfort and entertainment of the delegates and visitors.

A large amount of business was transacted with ease and promptness, and in so interesting a manner as not to become wearisome. This speaks volumes for the efficiency of the management, and afforded time for recreation, sightseeing and personal intermingling and exchange of good-fellowship.

The entertainment was so cordial that one could not but feel at home, and it appeared to me more like an old-fashioned New England family reunion than a meeting between people, many of whom but a few hours before had not known one another. The brickmakers may well be proud of their Convention and Buffalo of her brickmakers. With kindest regards, I am very truly yours,

PAUL PFOTENHAUER.
New York City, Feb. 10.

Impressions of a New Member.

Editor Clay-Worker:

Since my return from Buffalo, where we had such a royal reception and entertainment, I have begun to recall the theories, experiences and facts gathered, set the "disintegrator" going, and already begin to see a large amount of material to bring practical results next season.

Brickmakers, like their product, have a strong individuality, and each requires special treatment. I know of no place where we can get just what we need better than at a Convention like the one held last week.

The experiences of those we meet, when we adapt them to our use, help us both ways—in what to avoid, as well as what to do to get a right color, a sound ring and a perfect brick.

My advice to all brickmakers is: Join the N. B. M. A.; make a better brick, a good reputation, a broader man, and the highest success attainable in the art. Yours truly,
Springfield, Mass. T. S. POTTER.

The Spirit of Progress.

Theo. A. Randall, Secretary:

The resolution offered by Mr. Richardson at our last Convention presents itself to me as the most practical thing the Association has attempted. You will pardon me, therefore, for troubling you with my opinion: First, you should be assured, positively assured, of sufficient funds to carry on the work—not merely enough to start it. I am not familiar with the condition of your finances, but have the impression that money is not overplenty. Now, if subscriptions are in order, I want to say that our company will gladly contribute \$25 toward a fund to carry on the work for one year. I feel greatly interested in this branch of the Association's work, and would feel under personal obligations if you would allow me to keep in close touch with the movement. Have you ever considered how very small your annual dues are? Make them \$10 per year. You won't lose many members. The work being done by the clayworkers and by the Clay-Worker is yearly growing in importance. If a membership in your Association is not

worth \$10 per year it surely is worth nothing. Thanking you for courteous attention, both before and at the Convention, I am, with kind regards, yours very truly.

Ralston, Pa., Feb. 6.

HENRY HASBROUCK.

A Charter Members Opinion.

Dear Mr. Secretary:

I am just home from Buffalo, having gone a little out of my way to reach the old familiar office chair. The week since Convention has given me time to reflect upon the last annual gathering and to compare it with others. It seems to me that it will compare favorably with any previous ones, and in the disposition to do thoroughly can be safely said to be superior. I hail with satisfaction the prospect of a commission that shall settle definitely whatever it investigates, and that one after another of such questions as "efflorescence," "drying brick," "dry press and stiff mud brick," etc., shall be answered in a way to carry conviction to all who hear and read the Convention proceedings.

I am one of the very few who have never missed a Convention or a session of one, and the introduction of the resolution to send dear Brother Itner the telegram of regret for his absence brought forcibly to my mind the early possibilities in that direction in my own case. Our organization is unique in many ways, and its permanence seems to be secured. Whether this be true or not, the permanency of the friendships formed at these meetings is beyond question, and are to me very, very dear. Faithfully yours,

Chicago, Feb. 10.

D. V. PURINGTON.

Congratulations From One who has Been There Before Many a Time.

Mr. T. A. Randall, Indianapolis, Ind.:

Friend Randall—Well, the Convention is over, and most of us have returned home, but I will venture the prediction that no one who attended the meeting at Buffalo will ever forget it, should they live to be a thousand years old. I imagine that one would have to travel a long distance to find a more genial, open-handed, whole-souled lot of people than the brickmakers and Builders' Exchange people of the city of Buffalo, and the Convention—well, it was an "A one-er," and surpassed anything in the way of a Convention that I have ever attended (and I have attended all but two), a matter in which you yourself should take no little pride. When we consider the subjects treated and the intelligence with which they were handled, the N. B. M. A. should go out and throw out flowers at themselves. On all sides one could hear, "Well, I am glad I came," and, judging from appearances in Buffalo, certainly hard times have overlooked them.

I suppose the ladies likewise have reason to feel that they were not overlooked in the matter of entertainment, for I cannot remember of going to bed any night during the Convention (and I did not always retire before 10 o'clock) that I did not hear mirth and music on the parlor floor, and I still seem to hear Cunningham tossing from side to side, trying to get his good ear buried in the pillow, and murmuring to himself, "Wonder when they will get tired downstairs and let a fellow get some sleep."

Everything had a good look about it in Buffalo, which went a long way towards brightening the outlook for the future. Of course, the past has not been the brightest, but by mingling together and comparing notes we find that we are all in the same boat, and in the same old boat we will ride out the storm together, for when manned by the N. B. M. A. she can never sink. So here's to the craft in Buffalo. May their tribe increase, and may we always be "put off at Buffalo," where we are sure of being treated well and often. Very truly yours,
Anderson, Ind., Feb. 9.

W. N. DURBIN.

"The Brickmaker to the President" Tells of the Good Time He had at Buffalo.

Friend Randall:

After a week of unalloyed enjoyment we are home again. As a charter member of the N. B. M. A. I have missed but one meeting of the Association, and can say that the Convention held at Buffalo was one of the most interesting and important in its work of the entire series. It covered a wide range of subjects of surpassing interest to the different branches of our business. The question of the best methods of testing the relative merits of street paving brick was taken up, and the reports of the committee showed a thorough examination and a most exhaustive, fair and scientific inquiry

into this far-reaching question. The conclusions reached by the Convention on this subject alone will be of incalculable benefit and a saving of thousands of dollars to the street and engineering departments of the cities of the country.

None will question that the satisfactory work and profitable results attending the sittings of the Convention were largely due to the complete arrangements and careful attention to details made by the local committees, while the fair, dignified and original manner in which our presiding officer, Wm. H. Brush, handled the body, and steered clear of complications and mistakes and expedited its business, was commented on by all. This certainly contributed largely to the good feeling and earnest attention which prevailed during the entire Convention.

We all agree that the social features of our stay in Buffalo reached the high-water mark, while the memories of the enjoyments, good cheer and delightful surroundings of the few days we spent among our friends during Convention week have found a lodgment in our hearts which will not soon be effaced. Our coming found a veritable latchstring on the outer door, and, within, warm hearts and congenial spirits, who anticipated our every want and more than gratified our every wish. Considering the crowded condition of the hotel, we were well cared for; the rooms were neat and cleanly, while the table was excellent.

My good wife, whose enjoyment I hold of higher value than my own, will not permit me to overlook the disinterested kindness, considerate treatment and unstinted hospitality of the committee of ladies and gentlemen having charge of the entertainment of the contingent of ladies. It was several years before I could persuade Mrs. Adams to accompany me to these annual gatherings, but now nothing short of sickness in the family or a dispensation of Providence can keep her from answering the roll call of ladies on the opening day.

Do we realize that our wives and daughters have, with us, felt the strain of hard times, of a stricken business and of vanished profits, with the added suggestions that a change from the everyday, humdrum, treadmill process of life, with its unceasing round of household duties which falls to the lot of woman, uplifts their spirits and brings the color of health to their cheeks? No matter how agreeable her condition may be, or how favored her path in life, she who shares our joys and sorrows and the daughters who bring sunshine and hope around our hearthstones long for an occasional change of surroundings, of new conditions, new faces, new scenery, and even different cooking, and, possibly, better looking men, all of which they find, to greater or less degree, at the annual gatherings of the brick manufacturers.

To our good friends at Buffalo, their ladies, the officers and members of the Builders' Exchange, each and every one, we send our rosemary of remembrances.

J. C. ADAMS.

Indianapolis, Feb. 10.

Thoughts Since the Convention.

Secretary Randall:

"Put me off at Buffalo" once more say I, if the same crowd were in it. I do not remember a Convention that had more of the elements of success surrounding it, or a more united local spirit, than had this one. It goes without saying that the affair was a complete success, from both standpoints of pleasure and profit. It is profitable to have a "Brush"-ing up once in awhile, and we got it in good shape this time, for be it understood the brand of Brushes they keep in Buffalo is A1, with one little exception. (Now, my friend, keep off your gun till I finish, and I think it will all come out right.) There are three qualities that a brush must possess to rank first-class: First, it must look well; second, it must do its work in a satisfactory manner; third, it must be easy to handle. That our Brush is elegant of face and figure goes by a rising vote, everybody rising; that he did his work in a highly satisfactory manner "there's nobody can deny," but you can leave out the "easy to handle" clause, for our Brush had a way of his own (somewhat on the Gates order), and generally kept it, and, hardly perceiving it, you were soon over on his side of the fence. Let us hope that the brushing we got and the shine we took on at Buffalo will keep us in condition for our next meeting at New Haven.

For my part, I shall treasure the many pleasant and profitable recollections of the trip. At this time it is generally the custom to button-hole our thoughts and revise them, to find out just where we are at, after the swirl and agitation of our Convention labors and social dissipation. About the first thought to claim our attention is of the many prominent absentees, notably the Chicago, Philadelphia and St. Louis contingents. Many were the inquiries for McAvoy, Flood, Ittaier, Alsip, Howard (notice three ex-Presidents in this list), Blair, Whitney, Wolff and many others, men who have grown to be

landmarks in our careers and towers of strength to our Constitution. Always ready to put in the right word at the right place, or assist a humble aspirant up the rugged rocks and slippery places in the search for knowledge. It is very true—and we may congratulate ourselves—that we had still our Gates, Purington, Orton, Eudaly, Adams, and others whom it is safe to tie to, yet we cannot afford to dispense with the presence and wisdom of any. Life, at its best, is short, and we must crowd into it all the material available, remembering that we pass this way only once. Although the number of papers presented were few, as compared with previous years, their excellence was very marked. Myself and many others were disappointed that the question box did not receive better attention. Some important questions were treated flippantly and others were allowed to pass in silence, although many present were interested in them. This should not be the case. I would suggest, if you are interested in any particular question, whether you advanced it or not, that you speak to that question, give your views, and some other fellow is likely to follow suit. I also noted with regret that the machine, drier and kiln men were not as well represented as in former years, but those who did show up "got a wiggle on and humped for all they were worth." Some landed their fish; others baited the ground for a future haul.

Theater advertising is novel to brick men, but it certainly put the Simpson, Monarch, Chandler, Pike, Standard and Iron-clad appliances before the public. It also brought to light a new discovery—that Pike, our Pike, is a poet and a singer. The way he led that chorus was a decided set-back to the leader of the Vaseline Quartet. The boys—old and young—all declared to have had a "Reehl good time, by Jacobs."

It would not surprise me very much to hear that Messrs. Rumrill, Swegles and Almendinger had decided to go into the personally-conducted-tour business, for the way they handled the Niagara excursion was a treat. These gentlemen are evidently not dry press men, leaning obviously to the plastic method on the continuous principle.

There were lots of snap-shooters in the party, but as there was enough scenery to go round, and some over, everybody was satisfied. After a most enjoyable dinner came the inevitable farewell, and with many promises given and received we crossed over to the other side, carrying with us golden opinions of our Buffalo friends and enough free silver to see us home.

J. W. CARSON.

La Prairie, Ont., Feb. 8.

Ohio Valley News.

Editor Clay-Worker:

Very few of the sewer pipe and brick works in the valley are in operation, and there will be no general resumption until April. Most of the works are undergoing extensive repairs, as is the custom each year at this time.

Mr. Fred W. Owesney and D. C. McCurdy, of Steubenville, have leased the State Line Sewer Pipe Company's plant at East Palestine, O. The plant is one of the best equipped in eastern Ohio, and is being put in readiness for operation by Feb. 15. The lessees have had considerable experience in the business and practical workings of a sewer pipe plant, and they will undoubtedly make a success of their new venture. Mr. Owesney has for ten years had control of the office of the Great Western Fire Clay Company, of Toronto, and Mr. McCurdy has for seven years traveled in the interest of this firm.

Mr. W. B. Stevenson, formerly Secretary of the Chelsea China Company, of New Cumberland, W. Va., having bought the stock held by the Smith family, of that place, in the Black Horse Sewer Pipe Works, of McMahan, Porter & Co., becomes President and Treasurer of the firm. Mr. James Wilson, of Wheeling, W. Va., who has been Treasurer for quite a period, retires from the firm.

The Park Fire Clay Company, at Kenilworth, W. Va., has struck a very fine vein of clay at a depth of thirty-seven feet, reached by sinking a shaft about 7x14 feet. This big plant is being put in readiness to resume at an early date.

The Circuit Court sitting in Cincinnati refused the application of the receivers of the Royal Clay Manufacturing Company, of Uhrichsville, O., to sell real estate. There promises to be a long period of legal complications before the matter will be finally adjusted.

At a meeting of the Uhrichsville (O.) Board of Trade, the last of January, one hundred shares of stock, at \$100 each, were sold for the purpose of erecting a new sewer pipe and brick works in that city. The site has been selected, and work will commence as soon as the weather permits.

The Toronto (O.) Board of Trade is contemplating starting the Toronto White Ware Pottery, which has been idle for about five years.

BUCKEYE.

IMPROVEMENTS IN STIFF CLAY BRICK MACHINES.

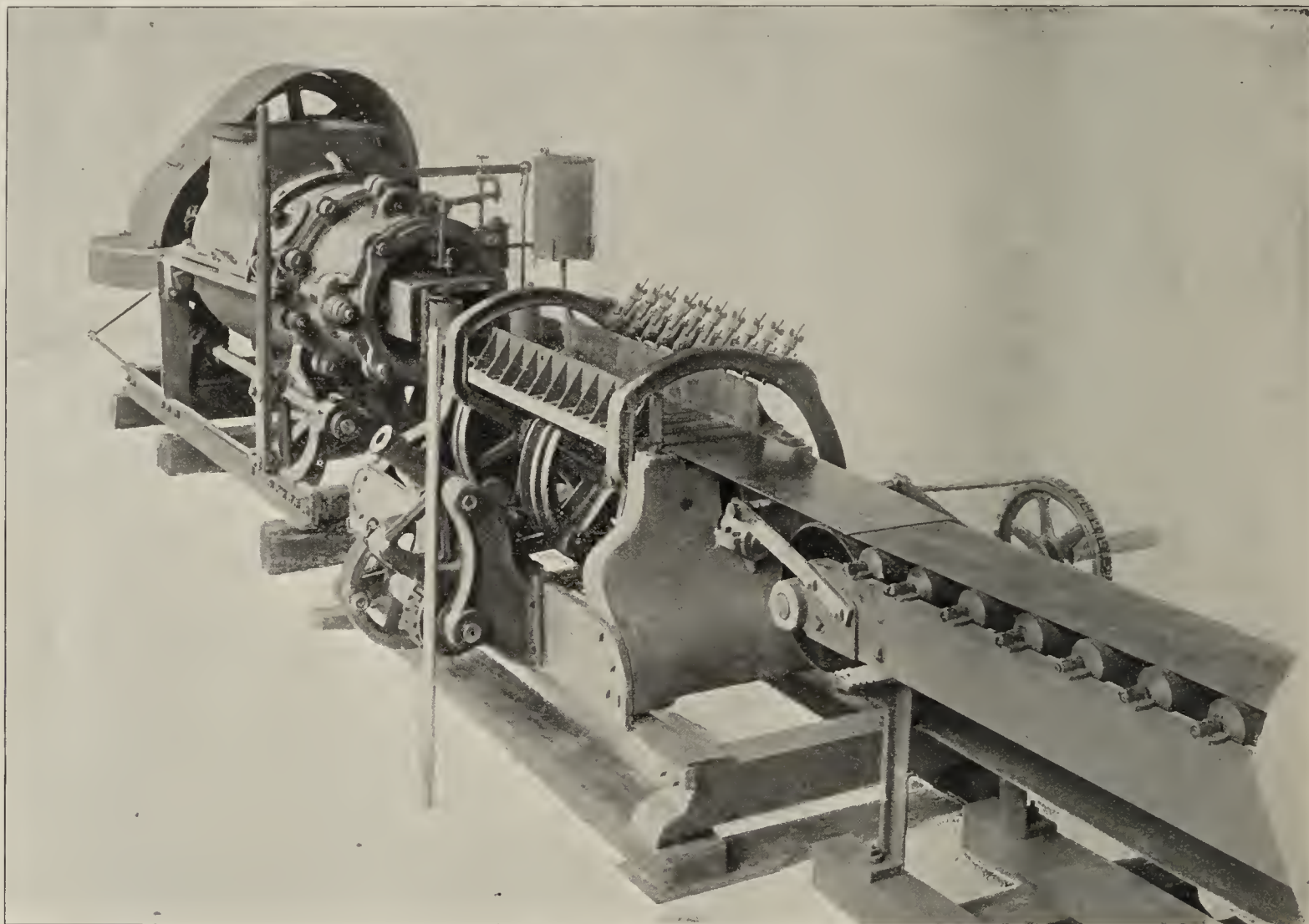
New Devices Introduced by the Chambers Brothers Company.

AMONG THE INTERESTING exhibits during the Convention was that of the Chambers Bros. Company, of Philadelphia, Pa., who, in addition to a lot of sample bricks of both English and American manufacture, showed quite a line of framed photographs of their machines.

This company devotes its attention entirely to the stiff tempered process of brickmaking, and has for many years been conspicuous before the trade because of the Chambers automatic end-cut auger machine. The Messrs. Chambers are now

enabling their customers to make sand-faced side-cut brick. This automatic sander is patented, and we believe the Messrs. Chambers are the only manufacturers producing a stiff tempered auger machine which sands all four sides of the bar of clay.

They have recently placed in operation a large mixing and pugging machine, in which they have combined the features of the double shaft mill for mixing different materials with the long, inclosed case, containing single shaft only, for pugging stiff, plastic clays. The main pug shaft is of hammered steel, seven inches in diameter, and is fitted with their regular steel-faced tempering knives, adjustable to any desired position. Immediately over this shaft, and extending for about one-half the length of the pug chamber is an independent mixing shaft,



CHAMBERS SIDE-CUT MACHINE WITH "TRIUMPH" LEVER CUTTING TABLE.

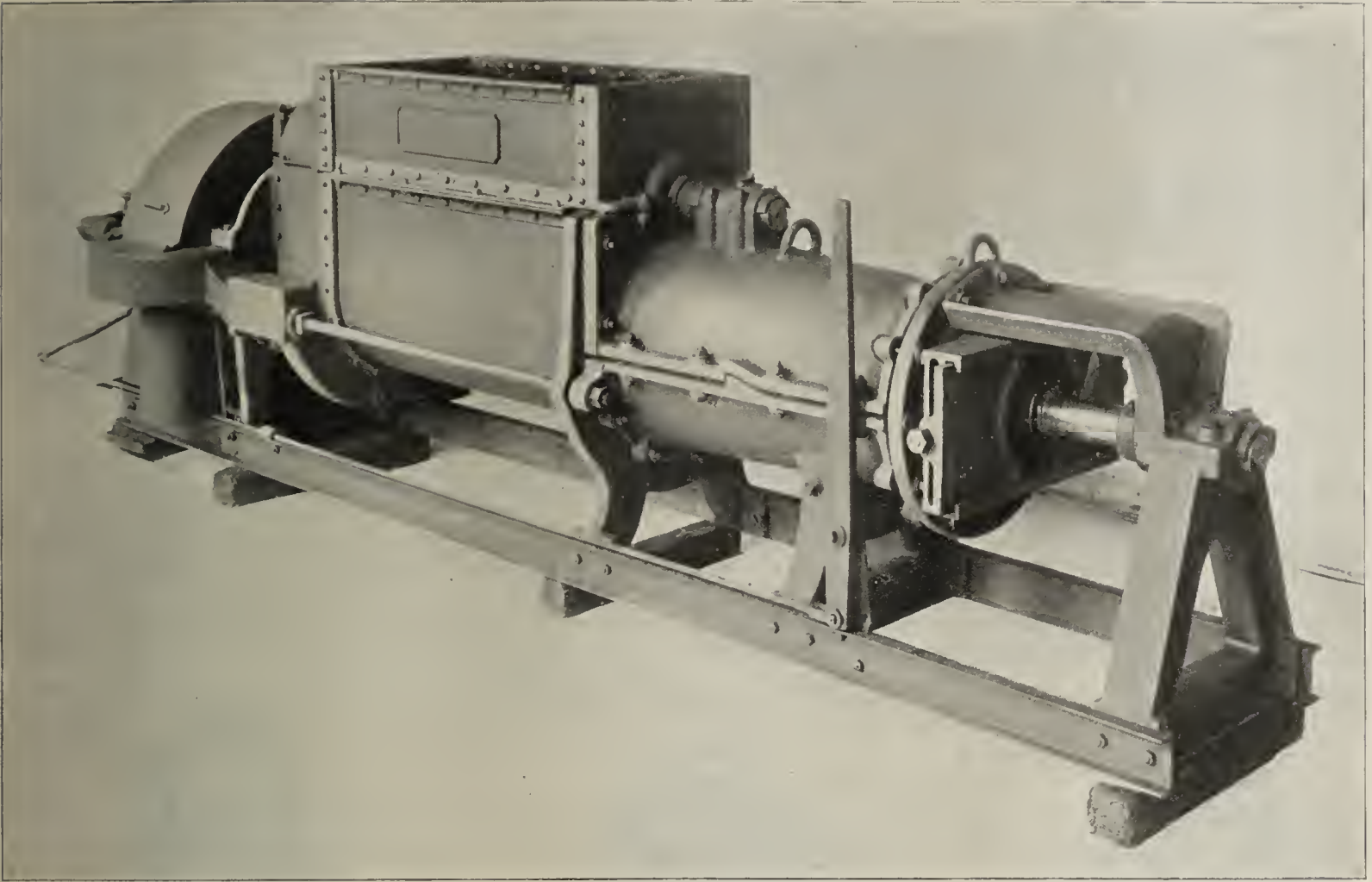
rapidly bringing out a line of heavy stiff clay grinding and pugging machinery, embodying some improved features, and also an improved type of side-cut brick machines, which they equip with various styles of cutting tables.

For working sticky, gummy clays, such as found in many localities, they have an improved form of oil-lubricated die with which they have been very successful in forming perfectly smooth, good bricks from clays that could not be manufactured at all with the ordinary auger machine. This die is applicable to both their end-cut and side-cut machines. We are enabled to reprint here some of the photographs shown.

This machine may also be fitted with dies for tile and various forms of hollow ware, fire-proofing, etc. This particular view does not show the Chambers automatic sander, but these side-cut machines are equipped with sanders when desired, thus

carrying four rows of steel bars, so located that they just clear the tempering knives in the main shaft. The distance between the two shafts only slightly exceeds the length of the knives. The operation of these two shafts in the material, with the close passage of the knives to each other, secures a thorough mixture of different ingredients before reaching that part of the chamber in which the process of pugging is completed. The rear portion of pug chamber is open at the top, thus giving ample opportunity for examination of material and regulating water supply.

The mixed and moistened mass of material is slowly and continuously fed forward to the inclosed portion of pug chamber, where it is thoroughly pugged under pressure and discharged by means of a short, double-bitted, hard auger through a circular opening, the size of which can be changed at will.



CHAMBERS No. 1.—COMBINED MIXING AND PUGGING MACHINE.

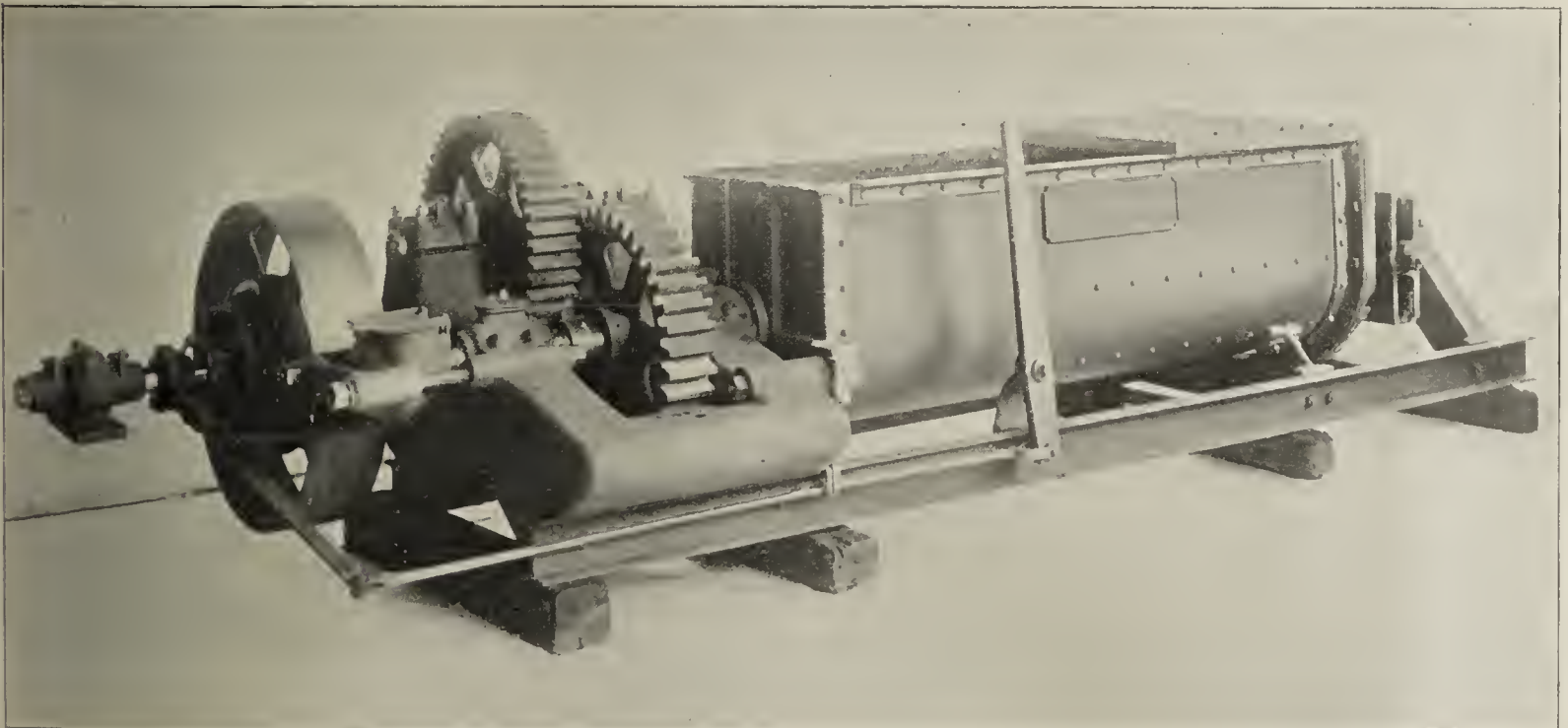
They claim this mill will do better work with less power than the old double-shaft mixer having both shafts of equal length and in the same horizontal plane, and that it is unequalled for mixing "grog" or ground calcined material with plastic clay.

This is a strong, single-shaft, horizontal pug mill, pugging clay under pressure and discharging by means of a short, double-bitted, hard iron auger through a circular opening, which can be made smaller or larger at will. It has a hammered

steel pug shaft, six inches in diameter, with forged steel-faced knives, so secured to the shaft that they can be set at any desired angle.

The whole machine is about fourteen feet long, and is mounted on channel frame, with the journal bearings of driving gear all in one solid casting. The driving and counter pinions are of steel. The gears are inclosed with metal covers.

The machine has bronze bushed friction clutch driving pulley, thirty-six inches in diameter by eight inches face, and is designed and guaranteed for heavy work.



THE CHAMBERS No. 2.—ALL IRON SINGLE SHAFT PUG MILL.

THE ILLINOIS CLAYWORKERS ASSOCIATION'S

19th ANNUAL CONVENTION

THE LAST CONVENTION, like the latest addition to a happy family, always seems the brightest and best. This is but natural, for, while the lapse of time dims the memory of bygone pleasures, the hearty hand-clasp and cordial greeting that welcomes every delegate to our yearly meetings warms the cockles of our hearts and makes all the world seem brighter and better for the time.

This thawing out of our better selves is of itself ample return for the time and expense of attending our Annual Conventions, which really do seem to grow better and more enthusiastic from year to year. So it appeared at Galesburg, when, on the morning of Jan. 19, the enterprising clayworkers of the Sucker State gathered, nearly a hundred strong, and, putting dull care behind them, enjoyed to the fullest the generous hos-

when he introduced his Honor, J. J. Tunnicliff, Mayor of Galesburg, who welcomed the delegates to the paving brick city as follows:

MAYOR TUNNICLIFF'S ADDRESS OF WELCOME.

Gentlemen of the Illinois Clayworkers' Convention—It gives me pleasure to welcome, in behalf of the citizens of Galesburg, an association that represents an art, the oldest of which we have record.

We read in Genesis that bricks were used in building the Tower of Babel, a structure that caused more confusion and annoyance to the human race than nondividend paying clay corporations of the present day do their stockholders. The Israelites were occupied making brick during their bondage in Egypt, and in II Samuel, chapter xii, 31, we are told that David made the children of Ammon pass through the brick kiln, a sort of crematory process, if like the modern brick kilns. It seems fitting that your Association should select this city for your Convention. It was here that the



Secretary C. G. STOLL.



President FAWCETT PLUMB.



Treasurer-elect H. F. TOWNSEND.

pitality and good cheer provided by the people of that beautiful city.

The meetings were held in one of the comfortable court rooms of the County Building, which was admirably adapted to the purpose.

After Secretary Stoll had taken the names and dollars of those present and decorated the lapel of each with a red ribbon bearing in gold letters the name of the Association, President Plumb called for order, and in his characteristically kind manner said he was pleased to see so large an attendance, and expressed the wish that the deliberations of the Convention might prove helpful to every member.

Secretary Stoll then called upon each one who had enrolled for a report of the past year's business and the prospect for the coming season. With but very few exceptions the members reported a fair trade, the average output being about 50 per cent. of the full capacity of their plants. Prices ruled low, and all agreed that the prospects were encouraging for the coming season.

President Plumb, on motion of Mr. E. M. Pike, appointed that gentleman, W. R. Cunningham and G. J. Ashby a Committee on Resolutions, and the meeting adjourned for lunch.

THE SECOND SESSION

Was called to order by President Plumb a little after 2 o'clock,

use of shale for paving brick was first successfully demonstrated.

From a small beginning the manufacture of paving brick has grown until Galesburg is recognized as one of the most prominent brick-making cities in the country.

The use of brick for paving solved one of the most serious problems which our Western cities had to contend with. With no stone or gravel, the discovery of brick for paving was most opportune. Brick pavements are more durable, better in a sanitary point of view than block pavements, as they do not absorb moisture, are easily cleaned, and in appearance are surpassed by no other pavement.

That Galesburg has faith in brick, nearly seventeen miles of brick pavement be a witness. We also have a fine pottery.

A clayworkers' association is not confined to brickmaking, but includes pottery, tile for roofing, drain tile, sewer pipe, building brick of different descriptions, terra cotta for ornamenting buildings, ornamental tile for hearths and mantels, and all the various purposes for which clay is used.

The importance of your business is evidenced by the fact that brick is necessary in some way in constructing the homes and business blocks throughout the length and breadth of the land.

A Convention of this character cannot but be of great benefit to the members of your Association. The meeting together of practical men engaged in the various clay industries, the discussion of the modes of preparing clay, the kind of fuel to be used in burning kilns, the degree of heat required, the modes of coloring brick for building purposes must lead to good results.

Allow me, in behalf of the citizens of Galesburg, to extend to you a most cordial welcome, and you will find the hearts of our citizens warm as the fires in the furnaces of your factories.

The Mayor's remarks were roundly applauded, and the

members then listened attentively to Fawcett Plumb, of Streator, while he read the

PRESIDENT'S ANNUAL ADDRESS.

Gentlemen of the Convention:

On this, the nineteenth anniversary of our existence, you are assembled to go through with the work provided by your worthy Secretary. This interesting programme is in keeping with the broadened scope of this Association. Many of you will remember when all of our efforts were concentrated on the work of farm drainage; and that the Drainage Journal, published by Father Billingsley, was the only periodical devoted to our work. To-day we invite to our discussions any and all clayworking enterprises.

We have just passed through a very trying year. We have our ups and downs as the years go by, and during the last nineteen years, as each round has been fought after a short breathing spell, we have returned smilingly to the contest. Many have retired from the field; others may yet do so, but he that intends to remain at his post does well to come here to our annual meetings.

We suffer from the effects of hard times, from competition among ourselves and from failures arising from our own ignorance and lack of good judgment. This Association offers no panacea for hard times, but when they confront us and competition is sharp we help each other by dispelling the ignorance we may labor under.

Some of the clayworkers of our State raise the question: Does it pay to attend our meetings? The one who comes most says it does. Now why is it profitable to come here? I am not sure I can tell just why it pays to come and become a part and parcel of this Association, rather than remain at home and read of us in the clay journals. Now, while we cannot make a complete success of either clayworking or our meetings without our clay journals, there is something in the personal presence of a gathering like this that is of a more inspiring effect than even the best journals can produce.

Experience in clayworking is a necessary factor in insuring success. The next in value is a close and intimate acquaintance with those who have such experience. Our Association is mutual, its

the ground that they cannot bring to us anything of value. The most valuable thing here is to be found in your presence and interest. Your lack of knowledge will be of value. Every one is at his best when talking to a willing and earnest listener. Your unsolved difficulties will put the best one of our Association on his mettle to assist you. Our efforts then will often develop in us some weakness not hitherto discovered, all serving to get into the right way. There is a magic in numbers. Ideas of value generate more readily in the presence of large numbers brought together for a common purpose. Let no one think our calling commonplace. The chemist will find a field for his best work. The mechanical genius is taxed to the utmost to overcome some of the demands made upon him to cheapen in cost and improve in quality the clayworkers' goods. The artist here, too, will find much to call forth his best efforts in shape and form to meet the demands for strength and decoration. It will not only pay from the standpoint of getting and giving value to the Association, but there is a satisfaction in being identified with an Association whose efforts are to promote that which is so useful as clayworking in all of its features. Our usefulness is attested by every well drained farm, by every well sewered city, by every yard of brick walk or street paving, by every well tiled housetop, by every terra cotta ornament, yes, by every chimney top, or even a common jug or earthen ware milk crock. And the beauties that are yet to be attained in the clayworkers' calling in the State of Illinois are paralleled, perhaps, only in some of our art stores in the great cities where English, German, French and American pottery are exhibited.

Most of what has been said might perhaps be considered as addressed to the absent ones. To those who are here I may say that our Associations have in them the possibilities of success and failure as well. To achieve success we must not only have useful ends in view, but each member should aim to make his presence felt by a determination of getting some good out of his co-laborers or by imparting something to a fellow-worker.

Your last annual meeting made a marked impression for good, and this one can do as well, and thus aid another step up to better ones yet to follow, so that when we go hence we shall carry from this meeting the feeling that it was good to have been here, and



Poet Laureate, D. O. LOY.



President Elect, W. S. PURINGTON.



Ex-President, E. M. PIKE.

members are anxious and ready to impart ideas born of experience and observation. These ideas conveyed by word of mouth will make a far deeper impression than through the press. The child in school needs more than books. He needs the presence of the teacher. Here we teach each other. Who does not even now catch the echo and re-echo of last year's hot and lively three days' meeting of this body? It may be well to read of these proceedings, but it is better to take part in them.

In extending the scope of our work we invite and entertain all clayworkers. A discussion of the various branches of clayworking is of value to all alike. It is apparent that a discussion of clayworking methods in one branch of work will throw light on some knotty problems involved in another. The laws of heat are the same when burning terra cotta as when burning sewer pipe. The manner of using it may be different. Fire clay mixed with some of our common clays will improve drain tile often as much as if employed in a sewer pipe mixture. At these gatherings we obtain clear impressions of certain chemical laws affecting our work.

The study of the effect of too great a preponderance of fluxing materials give us much light in overcoming difficulties in handling many clays. Now while these points and others like them may not be germane to your own specific line of work, a careful and critical discussion of them will sharpen the intellectual appetite and enlarge your grasp of the subject of clayworking generally, and thus be of advantage to you in your own line of work.

We must also bear in mind that in this age of competition he who has the clearest conception of the difficulties under which he labors and the best way to overcome them is the one who can remain in business when others are compelled to drop out.

Improved methods of making better and cheaper goods are constantly demanded of us. So I would say you cannot afford to remain away, because here is where you keep in touch with the most successful men and methods. Those who stay away cannot take

in this indirect way impress upon the one who fails to come that he must get into line with the successful ones of his craft.

We have in our State one hundred and two counties and in almost every one of them some sort of clayworking is carried on. If each county sends at least one man of energy and determination to our annual meetings our Association would become the pride of the clayworkers of the State and a rival of any of its kind. We look forward to the time when it will be as much of an object to get to the meetings of this Association as to get to that of the National Brick Manufacturers' Association, important as it may be.

With four millions of people in our State indirectly interested in our work, with a range of clays as any State can claim, with great cities growing up in our borders, with a great State calling for our goods, with energetic people to carry on the work, why not aim to make this Association the peer of any in the land?

As clayworkers, we include always the machine men, the kiln men and the journalist. No Convention is complete without them. They are veritable missionaries picking up and passing along to others valuable pointers.

To any and all who come among us from outside of our State, you are especially welcome. It will always be our great aim to make you feel that coming among us was good for you and ourselves as well.

To our entertainers and host, the city of Galesburg, permit me to say that we are glad to be here with you. We have heard of your vigor, your enterprise, your achievements, your long lines of well-paved streets, your extensive clayworking plants, your business success, your social attainments and your educational advantages. You, too, having a high aim have achieved as you deserve. This Association returns to you thanks for the welcome you have extended to us to hold the nineteenth anniversary of this Association in your city. We are certain that the time we shall spend here will be to our mutual profit and satisfaction. The citizens of Galesburg

are welcome to seats in our meetings at any time they may feel inclined to come. (Applause.)

President Plumb: The next on the programme is an essay by E. L. Hathaway, on

THE PREPARATION OF CLAY.

Mr. Hathaway read a short but interesting paper, describing his method of handling clay from the bank to the machine. He said they first went over their clay field in the spring with a sod plow, aiming to go two or three inches deep, or just below the grass roots, and this process he repeated during the summer when necessary, the object being to keep a thin layer of loose dirt on top of the clay to prevent it drying out. This makes the digging of the clay easier. As the clay is dug the loose dirt is thrown to one side. Mr. Hathaway operates two plants. On one the clay is soaked about twelve hours before using. On the other it is used direct from the bank, being dumped from car into hopper of brick machine, water being added there. The latter process is the most satisfactory, making better brick at a saving of 15 to 20 cents per thousand.

In closing his paper, Mr. Hathaway said he would like to know of a good plan for mixing different clays, a process he regarded as quite difficult to perform successfully. He said he knew a plant where they mixed some clays and made trial brick that seemed first-class, but when they undertook to make them on a larger scale the brick varied considerably in quality. The theory was that two parts of one kind of clay should be used and three parts of another kind, but when the men who shoveled the clay into the mixing pans got a little behind they were apt to put in whichever kind was the easiest to get, and trouble resulted.

The paper was discussed at some length. The prevailing opinion seemed to be that while it is practicable to mix clays for pottery and tile, where it can be handled more carefully, and the price of the product justifies it, it is difficult to accomplish in the manufacture of brick, where the volume of material handled is so large and the margin of profit so small.

President Plumb next introduced Mr. H. F. Townsend, of Avon, Ill., who read an instructive paper on the unusual theme,

CLAY CISTERNS AND CYCLONE CAVES.

Mr. Townsend has been manufacturing a patented cyclone cave for use in Iowa and other Western States, where protection from windstorms is found necessary. In the course of his paper he said:

The cave, when complete, is simply a large jug eight feet in diameter and about six feet to spring of crown, and on one side is an opening for stairway, which is of wood, but all protected from the earth by blocks; the cave to be set in the ground four feet and covered with earth. The cistern is the same thing, only the opening for stairway is omitted and the ventilating hole in the top is made large enough to fit sewer pipe.

To explain the making: We have a Frost dry-pan, a pug mill, a brick or tile machine and a large repress made for the purpose. For this repress there are seventeen different molds. To complete a cave takes 160 blocks from these molds, ranging in number from one to forty-eight of each. As the blocks are not interchangeable we find it takes some figuring to keep stock.

From the brick machine a stream of clay is run 6 inches by 12 inches, from which is cut enough to make the block intended. The blocks for the bottom of the cave or cistern and the sides of the cellar way are all flat and about 2½ inches thick. The sides of the cave or cistern curve one way to form the circle, and are made by putting a form of wood in the bottom of the mold, which also makes a flange on one end like a sewer pipe. When taken from the repress they are turned over on a pallet to fit them, the bottom form is taken off, grooves cut in each edge and holes punched in the end. The grooves thus made form round holes between each block when set up, and into which cement is poured. The holes punched are for iron staples, which hold the blocks together when setting up. The flange serves as a brace, and also holds cement in which the next top layer of blocks is set. The pieces forming the top of this jug, of course, have to circle or curve two ways, and are made on wooden forms similar to the side wall pieces. From the repress the blocks are taken on the pallets to a brick floor heated by steam pipes bedded in sand and are set on edge, drying in from three to five days. To burn they are also set on edge parallel to each other, separated by a hack of brick, which is carried up high enough to tie across over the blocks, these bricks thus

forming the bottom for another tier. They are thus carried to top of kiln, which is generally covered with blocks. In size these blocks are about 18 inches square, and when green weigh sixty or seventy pounds each.

We find it quite a different thing from making common brick or drain tile to get these out in good shape without too much loss. In fact, that has been our trouble, as sometimes, owing to conditions not fully known, the blocks will check badly while drying. This has been overcome some by running trash (broken tile) with them. Of course, in pieces of clay of this size, the difference in shrinkage has been considerable; this we can only remedy by sorting.

The next on the programme was the following brief paper by Jas. A. Wilson, of Pawpaw, Ill., on

A WELL-PLANNED FACTORY.

The subject which I have taken is of such great importance that I fear it should have been handled by an older and more experienced man in the clay business than I am, for the difference between a factory which is laid out in the best manner or one that is badly planned may mean, in the one case, success; in the other case, ruin to the owner.

The factory which I have in mind is one for the manufacture of common brick and drain tile, and in arranging this, I would have dry sheds, three in number, 200 feet long by 24 feet wide and one story high. I would place the machine building in the center of the middle shed, for convenience in off-bearing, and have two racks six feet wide, with one foot on each side of this space movable at will, while filling and emptying shed. The racks should be five feet high for either brick or tile.

The best way to off-bear is with cars, using transfer tracks at the machine so as to go to any part of the shed at will.

The shed should have three tracks, one in the center and one on each side, with a space for the tracks four feet wide the full length of the building. The doors also should be four feet wide. This kind of building, fitted up with steam, is very convenient for drying and handling the ware.

At each end of the sheds I would have a kiln, also transfer tracks at the kilns, so as to be able to go to any part of the sheds or any kiln is desired. With this arrangement, brick especially can be taken through the processes of handling by means of cars to great advantage. Fewer men are required and the work is easier and cheaper. By using cars two men can off-bear 12,000 4-inch tile or 25,000 brick in ten hours.

Plants thus arranged are more convenient for handling ware, both brick and drain tile, to and from sheds and kilns. We have two yards arranged in this way, and find it much easier to fill kiln and also much cheaper to use cars than to use wheelbarrows.

In the discussion that followed it developed that there was a very marked difference of opinion as to the economy of the different methods of drying, some advocating the rack and pallet system, while others thought the tunnel system the more economical of the two. The latter, however, it was claimed, was not suitable for drain tile, owing to the amount of space required for large tile.

President Plumb called for the next on the programme, which proved to be an entertaining and instructive paper by J. W. Mamer, Campus, Ill., on "The Use and Advantage of Hollow Blocks," the full text of which will be given in a subsequent issue of the Clay-Worker.

Mr. George J. M. Ashby next read an elaborate paper on

DRYING CLAY WARE.

Prepared by F. Lehman, of Chicago, after which F. G. Lotterer, of Fort Scott, Kan., exhibited a series of wooden models of some new and novel clay products which he proposes to introduce, and on which he has applied for patents. Among other things he proposes to make are clay fence posts, railroad ties and sleepers for street railways, and different forms of street curbing. These, he thinks, when made of shale or suitable clay, will prove more durable and satisfactory than anything now in use.

The Convention then adjourned.

WEDNESDAY'S SESSION.

The regular programme provided for an excursion Wednesday morning to the paving brick plants near Galesburg, but the weather man was unkind enough to send rain that morning, so the excursion was postponed till afternoon, and the Convention was again called to order by President Plumb at 9:30 a. m., and the relative merits of solid and perforated kiln floors were discussed, some preferring the former and others the latter.

President Plumb: Gentlemen, we will give an attentive ear to Mr. W. S. Purington, of Galesburg, while he tells us what he knows about the comparative value of coal and oil as fuel for burning brick.

Mr. W. S. Purington then read the following paper, entitled:

COAL VS. OIL.

Some three years ago this month I read a paper before the N. B. M. A. in Chicago on the same subject I have been assigned here, viz., "Coal vs. Oil." Now, as I put the preparation of this paper off longer than I should, it occurred to me that, as probably every one who had heard my paper in Chicago had forgotten it ere this, I could just as well use it here, so I found the Convention number of the Clay-Worker and read it over, but I concluded when I finished it that perhaps I had better make a few changes, for at that time we were using nothing for fuel but oil, and as we were the only manufacturers in this country using oil for burning paving brick, it was natural I should try to make people think that unless a paving brick was burned with oil it was no good. (Laughter.) We also found it convenient to have some distinct feature about our brick, and on this particular point we had no competitors. But I want to say that I am just as enthusiastic over paving brick burned with oil as I ever was, and if the directors of the Standard Oil Company were satisfied with as small dividends as most brick companies we would probably be using it yet.

I think there is no fuel used (except, perhaps, natural gas), that gives so fine a color to the brick, and I am still of the opinion that they will stand higher tests of all kinds than brick burned with any other fuel; and for saving in labor, increase in capacity of kilns, and general results all around, it is superior to coal. The only thing I have against it is its present cost.

When we first commenced burning coal we had poor results, from the fact that the top courses were brittle and had to go into building brick. At that time we were using grate bars, and as the coal we use clinkers a good deal, we found too much cold air went in while clinkering, as the clinker would coat the bars over and was nearly as hard as the bars themselves.

While visiting a neighboring yard I saw them burning coal in their wickets, or doorways, on the ground, without using any grate bars; so I came back to the yard, and having a kiln that had been on fire two days, I pulled the bars out, letting the coals fall into the pit. We burned this kiln in this way, and the results were so good that we at once changed all our furnaces by lining the ash pit with fire brick (where common brick had been used before), making fire box twenty-two inches wide below grate bar level, and thirty inches above, which left a dead space of five courses between fire door and door where we take out clinkers. We find instead of having top courses builders, that they are as good as any brick in the kiln. This is due to the fact that there is no cold air goes in kiln while clinkering is being done, and in this way we bring our brick nearer to an oil burned brick, for we all know that the less cold air we let in a kiln of paving brick the tougher they will be.

We are at present changing the furnaces on our No. 1 plant so that we may use coal in the future, and, owing to having only fourteen feet between kiln walls, we are constructing our fire boxes in the bottom of the bags. I say we are doing this because our kilns are so close together, but not altogether for this reason, for I don't think if a man was going to build a house that he would build a furnace on the outside of his house to heat it, and on the same principle we believe the closer we get our fires to the brick the less waste we will have from radiation.

In burning without grate bars it is impossible to use other than lump coal, as when using nut or slack it packs too closely, and does not allow enough opening to make a free draft. Even at the advanced price of oil, we still continue to use it for drying in driers, as we let the product of combustion pass through the brick, and while there may be cheaper fuels, we are pretty well satisfied with it. Under boilers oil is an expensive fuel, where coal can be bought at a reasonable figure. There are a number of points where a saving can be made by using it under boilers—the saving of a fireman, removing of ashes, and being able to regulate your steam more readily, but the difference in price between oil and coal is too great here.

I think the time is coming when we shall utilize all the heat that comes from our cooling kilns, and if our company ever makes any money, will be in favor of adopting some system that will utilize it, either in our driers or for watersmoking our kilns.

In closing, will say I am in favor of that material for burning that gives the least loss—was going to say most profit—but profit in the brick business is a thing of the past. (Applause.)

In the discussion that followed his paper, Mr. Purington said he thought that at prevailing prices coal was cheaper than oil by at least 50 cents a thousand.

President Plumb next introduced Mr. B. F. Townsley, of Aledo, Ill., who spoke on the merits and demerits of cement walks as compared with brick. He argued that while cement walks were smooth and attractive when new, they were less durable than brick walks, and as the first cost of the latter is, he thinks, only about one-third that of cement, the brick walks are the cheapest as well as the best. Brickmakers need not fear the competition of cement walks if only No. 1 paving

brick are sold. In conclusion, Mr. Townsley said: "Clay has been tested for so long a time and acknowledged to be the most indestructible material, more so than all metals. I remember reading a piece of poetry once about the trial of metal vs. clay, but do not remember it all now, or if there was anything in it about cement, but think it ought to have included cement, so will put it in:

"They have summoned gold and silver, and their brother, iron ore, From the mines where they had hidden in the ages long before— Copper, lead, tin, zinc and cement, a jolly band of brothers, they All to stand the test of time in a trial against clay.

"But I think they were all found wanting for paving purposes, especially gold." (Applause.)

President Plumb then called for Thos. S. McClanahan, City Engineer of Monmouth, Ill., who read an able and exhaustive paper on "Paving Brick for Country Roads," describing a brick roadway built near Monmouth under his supervision during the past year, an account of which appeared on page 471 of the December Clay-Worker. Mr. McClanahan is confident that in the near future brick paved country roads will be quite common throughout the West.

President Plumb: We will now hear the report of the

COMMITTEE ON RESOLUTIONS.

Mr. President and Gentlemen of the Convention of the Illinois Clayworkers' Association—Your Committee on Resolutions begs leave to report as follows:

That approaching with regret the hour when we must bid goodbye to the beautiful and prosperous city of Galesburg, and deeply sensible of the splendid hospitality and delightful courtesy we have found here, the thanks of the Illinois Clayworkers' Association be tendered to the Reception Committee, consisting of the Purington Paving Brick Company, the Frost Manufacturing Company, and the Galesburg Vitriified Brick Company, with special reference to Andrew Harrington, of the Frost Manufacturing Company, who brought us the invitation to Galesburg at our last annual Convention. Therefore, be it

Resolved, That the thanks of the Association be given to our retiring officers and our appreciation be expressed of the distinguished services of President Fawcett Plumb, of Streator, and his colleagues, Vice President J. W. Skinner, of Varna, Treasurer Wm. Stare, of Mendota, and Secretary G. C. Stoll, of Grant Park, Ill.

That the thanks of the Association be given to the Hon. Mayor J. J. Tunncliffe for his address to the Convention and the friendly welcome offered to us on behalf of the citizens of Galesburg.

That the thanks of this Association be given to the Galesburg Commercial Club for throwing open its handsome club rooms to us and admitting us to its social privileges.

That the thanks of this Association be given to the remarkably enterprising newspaper press of Galesburg, the Mail and Daily Republican Register.

That the thanks of the Association be given to the Galesburg street railway companies for the transportation facilities accorded to our visiting members; and last but not least,

That the thanks of the Association be tendered to those ladies of Galesburg whose delicate supervision and assistance made the banquet at the Universalist Church a perfect gastronomic success.

E. M. PIKE,
W. R. CUNNINGHAM,
GEO. J. M. ASHBY.

Treasurer Wm. Stare's report followed, which showed a substantial balance in the treasury.

ELECTION OF OFFICERS.

President Plumb: Gentlemen, the next in order is the election of officers. Nominations for President are now in order.

Andrew Harrington, of Galesburg, nominated Mr. W. S. Purington, of Galesburg, and he was unanimously elected to the presidency for the ensuing year. President Plumb caused a ripple of merriment by calling Mr. Purington to him, ostensibly for a conference, slipped the gavel in his hand and left him to preside over the Convention during the remainder of the session. Notwithstanding he was taken totally by surprise, he acquitted himself creditably, as the Puringtons are wont to do.

Lincoln Solfisburg, Aurora, Ill., was unanimously elected Vice President, as was H. F. Townsend to the treasurership, the faithful Secretary, G. C. Stoll, being re-elected, and on motion of Mr. D. V. Purington it was ordered that his salary be doubled. When it developed that he received no salary at all a broad smile pervaded the audience.

Mr. Geo. J. M. Ashby, in behalf of his employers, extended an invitation for the Association to hold its next meeting in Chicago, which was referred to the Executive Committee, after which the Convention adjourned sine die.

THE BANQUET.

The social feature of the Illinois Clayworkers' Nineteenth Annual Convention occurred Tuesday evening, when the visitors were treated to a rare feast, served in a very unusual and attractive way. As guests of the Purington Paving Brick Company, the Galesburg Vitriified Paving Brick Company and the Frost Engine Company, the delegates assembled in the basement of the Universalist Church, where the ladies of that institution served, in the most appetizing manner imaginable, the following menu:

	Raw Oysters.		Wafers.
	Tomato Soup.		
Turkey.	Mashed Potatoes.		Cranberries.
	Rolls (Parker House).		Peas.
Ham.	Saratoga Potatoes.		Olives.
	Rolls.		Cabbage Salad.
	Ice Cream.		Cake.
	Nuts.		Raisins.
Coffee.	Crackers.		Cheese.
	Wind, Wit and Wisdom.		

The last item on the list proved the most popular, notwithstanding that the other courses were daintily served by beautiful women. With the inner man so thoroughly satisfied, it is little wonder that the speakers were one and all accorded generous applause.

The fun began with the opening address of that model toastmaster, D. V. Purington, who has a happy faculty of putting an audience at perfect ease, and continued uninterruptedly for several hours.

The principal speakers of the evening were F. C. Rice, the Galesburg representative of the C., B. & Q. Railway; ex-President Fawcett Plumb, W. A. Eudaly, D. O. Lloy and Andrew Harrington. The latter disclaims any ability as a public speaker, but thinks he is a pretty good poolplayer. The writer differs with him on both propositions. All he needs in either is practice—a little in the first and a good deal in the last.

THE TRIP TO THE BRICKYARDS.

Wednesday afternoon, despite the rain, the visitors made a brave effort to carry out the programme and accompany the Reception Committee to the paving brick plants located two miles or more beyond the city limits. A special train of three trolley cars was provided by the local committee, who also furnished cigars for all who would indulge. It was a jolly crowd, bent as much on having a good time as on inspecting the plants, an interesting description of which the reader will find on pages 24 and 25 of the January Clay-Worker.

LIST OF MEMBERS OF THE ILLINOIS CLAYWORKERS' ASSOCIATION.

Abingdon Paving Brick and Tile Co., Abingdon, Ill.
 American Clay-Working Machinery Co., Bucyrus, O.
 Anderson Foundry and Machine Works, Anderson, Ind.
 A. R. Batley, Griffin, Ill.
 "Brick," Chicago, Ill.
 E. W. Bach, Ottawa, Ill.
 W. H. Batley, Griffin, Ill.
 Chicago Brick Machine Co., Chicago, Ill.
 "The Clay-Record," C. J. Hartwell, Chicago, Ill.
 C. H. Chamberlain, Galesburg, Ill.
 G. H. Drew, Purington, Ill.
 S. R. Ellis, Canton, Ill.
 W. A. Eudaly, Cincinnati, O.

E. M. Freese & Co., Galion, O.
 Frost Mfg. Co., Galesburg, Ill.
 E. S. Gunnell, Galesburg, Ill.
 F. C. Griffin, Griffin, Ill.
 Galesburg Paving Brick Co., Galesburg, Ill.
 E. L. Hathaway, Macomb, Ill.
 Wm. Hammerschmidt, Lombard, Ill.
 H. Haigh, Catskill, N. Y.
 John Hummert, Quincy, Ill.
 John Jansen, Pekin, Ill.
 D. E. Kretsinger, Egan City, Ill.
 D. T. Larriau, Ottawa, Ill.
 D. O. Loy, Atkinson, Ill.
 F. G. Lotterer, Fort Scott, Kan.
 L. H. Lambert, Beaverville, Ill.
 J. M. Mamer, Campus, Ill.
 N. L. Mamer, Campus, Ill.
 S. D. Mills, Colchester, Ill.
 M. G. McNaughton, Villisca, Ill.
 John McCabe, Rushville, Ill.
 J. B. McHose, Boone, Ia.
 D. V. Purington, Chicago, Ill.
 W. S. Purington, Galesburg, Ill.
 E. M. Pike, Chenoa, Ill.
 F. Plumb, Streator, Ill.
 H. C. Patton, Flanagan, Ill.
 J. M. Powell, Orestes, Ind.
 John Potter, Galesburg, Ill.
 T. A. Randall & Co., Indianapolis, Ind.
 J. W. Skinner, Varna, Ill.
 G. C. Stoll, Grant Park, Ill.
 F. E. Swift, Washington, Ia.
 F. R. Stryker, Joliet, Ill.
 J. L. Smith, Galesburg, Ill.
 L. Solfisburg, Aurora, Ill.
 C. Solfisburg, Aurora, Ill.
 Charles Soeller, Pekin, Ill.
 Simpson Brick Press Co., Chicago, Ill.
 Wm. Stare, Mendota, Ill.
 W. E. Sidney, Buffalo, Ia.
 F. Townsley, Alexis, Ill.
 G. A. Tompkins, Avon, Ill.
 H. Townsend, Avon, Ill.
 Thos. Trainor, West Chicago, Ill.
 The Wallace Mfg. Co., Frankfort, Ind.
 Williams, White & Co., Moline, Ill.

"ANDY" HARRINGTON AT HOME.

Immediately after adjournment, Wednesday, the Illinois Convention went in a body to the works of the Frost Manufacturing Company, where they were welcomed cordially and shown through the factory by Mr. Harrington, whose kindly and unpretentious manner has won for him the earnest friendship of every member of the Association. The plant is large and well equipped for the production of their specialties—dry pans and engines. In the latter line they have a new model for the coming season that is peculiarly suited to brickyard use.

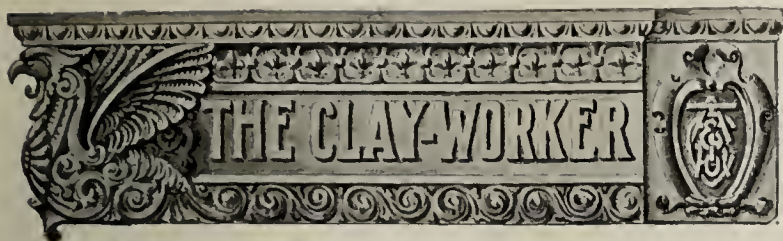
An interesting incident of the visit was a group picture taken by Mr. Ashby, who has become an expert in matters photographic.

THE OHIO CONVENTION.

With the Ohio Convention which was held at Zanesville, February 12th and 13th, the convention season closes. The experiment of leaving Columbus and meeting at points where extensive clayworking establishments can be visited, will be repeated in the future, as that feature proved very pleasing and profitable. The attendance was not as large as had been hoped for, but the spirit of the meeting was markedly enthusiastic. The following officers were elected for the ensuing year:

President—E. F. Darnell, Grove City, Ohio.
 Vice-President—J. D. Rumsey, Stryker, Ohio.
 Secretary—Prof. Edward Orton, Jr., Columbus, Ohio.
 Treasurer—W. B. McClure, Warsaw, Ohio.

J. Wheaton Stone, the genial representative of the Eastern Machinery Co., New Haven, Conn., writes that he is holding for identification a pair of Niagara Falls slippers which were dropped at the railway station at Buffalo by one of the N. B. M. A. party. They will be surrendered on application.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " " " " " "	10.00
Ten copies, " " " " " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVII. FEBRUARY 1897. No 2.

CONVENTION ECHOES.

The National Brick Manufacturers' Association has moved beyond the kindergarten stage. It now discusses business in all its details. It is getting down to exact facts.

* * *

President Brush proved an excellent presiding officer, directing the affairs of the Convention in a business-like manner. His aptness and great good nature made him popular from the beginning.

* * *

The Buffalo Convention was the first meeting we have held on New York soil. From the interest and enthusiasm of the knickerbockers who were with us, many of them for the first time, it needs no prophet to foretell future meetings in the Empire State.

* * *

The new member was with us very numerously, and was very much in evidence, especially in the lobbies. One was heard to say: "What I have learned at this convention will enable me to make better brick, and I think to make more money." We hope to hear from him further at the next convention.

* * *

The talk in the lobbies was an epitome of the spirit of the Convention. It was the best of all: "Splendid Convention," "A business body," "The best papers that were ever presented to a Convention," "The most serious discussion we ever heard," "We never knew the local brickmakers to take a more sincere interest in a Convention."

* * *

Mr. George W. Carter, Chairman of the Ladies' Reception Committee, and his able lieutenant, Mr. F. E. Tanner, won many compliments from the visiting ladies.

The Committee of Ladies to entertain the visiting ladies was headed by Mrs. Warren Brush, who had with her a large num-

ber of active workers. The National Brick Manufacturers' Association certainly feels itself under great obligations to the Builders' Exchange of Buffalo and to the ladies and gentlemen of that city, who so ably and gracefully extended their aid in making one of the most successful meetings in the history of the Association.

* * *

It is no light charge to handle a body of this kind in all its relations. There is both the business and the social side to be considered. There are times when the social aspect cannot be neglected for the business, and, more conspicuously, there is the occasion when the body must be held down to business. Too much cannot be said in commendation of President Brush. He was equal to every emergency.

* * *

A few years ago the strictly business matters, as distinguished from those which were technical, did not find a large place in our Convention. Through the influence of organization, through competition as the result of the example set by other manufacturers, the question of business has been gradually receiving more serious attention in an incidental way and in the formal papers presented to the Association. The paper of Mr. H. H. Fernald is typical of that development in Association literature, and it is our judgment that in the future of this body the matters of business, extension of trade, restraints of competition, the work of the specialist, will receive yet larger and more earnest consideration from the larger part of the members.

* * *

The Builders' Exchange of Buffalo will live long in the memory of those who attended this Convention. The arrangements for the comfort of the delegates, the consideration for the members and their wives during the time when the Convention was not in active session, could not have been more discriminating. Too much cannot be said in praise of Mr. Henry Rumrill, Jr., President of the Builders' Exchange, and his right bower, Mr. J. C. Almendinger, the Secretary. Men of strength and ability always do what they have to do in the best possible way. We must know that men who did what these men found to do for this Convention, for its convenience in session, for the comfort of the visitors at all times, are as successful in their personal lines of work as they are in what they do for others. Everything possible was done for the convenience and comfort of the visitors.

A GOOD CONVENTION.

The Buffalo meeting was one of the most successful Conventions in the history of the National Brick Manufacturers' Association. There was more business in it, more specific technical knowledge, a better social spirit, a closer getting together than has hitherto been known in the history of this Association. It was a development of the seed sown in former years. One Convention builds up to another. The spirit of all the Conventions has been good. Each has helped to make the next one better. If not so, why should we convene? Should there come a time in its history when people say: "We have told our story; there is nothing more to do; each of us knows what the other knows," then it would be time to disband. This is not true of the recent Convention in Buffalo. It was full to overflowing with new ideas. The literature of this Convention has never been excelled. On the other hand, it left more visible for the future than any other Convention. After the first two or three Conventions of brick manufacturers there was the thought that within a short time the subject of brickmaking would be exhausted, but with the advance of time we find there is yet more and more to be considered. This Convention, with all its thoroughness, with all the documents presented to it, notwithstanding the high character of its papers, probably never had more unfinished business than at the last meeting. The Convention did not adjourn until 7 o'clock on the last day, and at that time the interest was intense, and when the

closing session adjourned it was like turning out a bright light. It stood full strength until the last. All will look back upon it with happy memories, and with the thought that they never attended a more profitable Convention, and certainly never before one fraught with more interest.

THE POWWOW.

The powwow was a powwow, indeed. We look back into history in vain for its equal. There was seriousness and there was the other thing, and there was lots of it. The members began to gather about 8 o'clock. Until about a quarter after 9 the meeting was informal, conversational and quietly social. Mr. J. C. Adams made the opening address, of a character somewhat serious, certainly serious enough for a powwow. After that the powwow fell into the hands of Mr. Rumrill and Mr. Almendinger, and certainly never before into better hands. It was the powwow of powwows. At 1 o'clock time was called. It was then that the fun was at its height. The closing of the powwow was under the protest of the local managers. But it was thought that one day's work should not lap over on another, and that the wives of the members were anxiously, sleepily, and in a lonesome, dispirited way, waiting for them to return to the hotel. And lo and behold! when the members went to their rooms the ladies were not to be found. The porters and the bellboys said they were in the dining room, and there they were found—a female powwow in full blast! It was organized according to the most approved methods, and showed clearly enough that, while novices in the powwow business, the ladies know how to enjoy this function as well as do the gentlemen.

CLAY FIRE-PROOFING IS FIRE-PROOF.

In a discussion of a paper on the subject of fire proofing Mr. Purington made a remark in an informal way which was capable of misconstruction. His remarks, if used out of their proper relation, would serve as an effective weapon by the manufacturers of cement and stucco. It is generally known that there are certain clays that are not satisfactory for fire-proofing purposes. An exceedingly vitreous material may succumb to the sudden variation of temperature caused by heat and water. On the other hand, this fact is generally known, and for the most part proper materials are used for fire proofing. This matter is mentioned in this connection to place clayworkers on their guard so that when the manufacturers of other fire-proofing material make the statement that one of the most prominent clayworkers has questioned clay as a fire-proofing material the matter will be properly understood and properly met. The discussion, and particularly the second day's discussion of this question places this matter in its proper light.

BRICK PAVEMENTS BEST.

The keynote to this Convention was what it did for paving brick; the work of the Committee on Standard Specifications and the report of Professor Orton on tests. One member was heard to say in the hotel lobby what might well have been said in the Convention: "The standard specifications for brick and the essay upon tests appear to indicate what has never before been known in the history of paving and street coverings generally. These specifications indicate that if brick be made and burned to a certain texture, if the character of the material be suitable, the results can be exactly foretold. The tests of Professor Orton appears to indicate this. Now, if we may have this positive information with respect to brick, if we may know its actual lasting qualities before it is put down, the public will more surely demand brick pavements rather than those of doubtful utility. Certainly asphalt is unreliable. Whatever may have been its history in special instances, there is always uncertainty as to its future. Its last-

ing qualities depend upon the character of its mixture, the material used and the integrity and watchfulness of every man connected with its manufacture from beginning to end. This is the general history of asphalt, the best paving material known in America up to the time that brick paving was perfected. Do you not know," said this gentleman, "that with our present knowledge we can positively guarantee paving brick that answer the requirements of the standard specifications? Of what other paving material can this be said? Hitherto there has always been guesswork. Certainly in this Convention, through the work of the committee and Professor Orton, more has been done in the interest of paving and paving material than has ever been done before."

CLAY IN ARCHITECTURE.

Mr. Henry R. Griffen presented a very interesting paper and a very valuable one to the Convention. He suggested that the future would demand hollow bricks, and from the present outlook there can be no question as to the correctness of his views. He said: "The increase in the demand for a hollow building material has come to stay. The hollowness of this material was, of course, primarily suggested because of its lightness and also because of its dryness. The present methods of steel construction have brought about this demand for a lighter material, and the use of hollow brick, hollow tile, fire proofing and other similar material is in obedience to the demands of economy. The weight of buildings has been very largely decreased during recent years without impairing their stability, and during future progress in this direction it will be necessary for the clayworker to modify many of the present methods and develop new forms looking to lighter construction if he does not expect to be bested in the race by the manufacturers of various kinds of cements and stuccoes. There is now a very strong effort upon the part of the manufacturers of the various kinds of cement to have it substituted for clay. Hollow brick and hollow tile is a step in the right direction and may head off the cement men.

VALUABLE TECHNICAL WORK.

No commendation of ours can add anything to the value of the work of the Committee on Standard Specifications, which was ably assisted by Professor Orton's paper on "Standard Tests." This work marks a distance epoch in the progress of brick as a paving material. Hitherto there has been nothing organic in the demands of the friends of this material for paving purposes. Bricks of all kinds and all values have been made. Opinions have varied greatly as to the best material and the standards of excellence. We believe that this work settles many of these questions. It is certainly true that we have now before us valuable data which will give to the world at large absolutely reliable information upon the subject of paving brick. It must certainly furnish a great outlet for clay products. If the work of formulating data on the subject of paving brick should continue we would soon have an organization which would be equal to that compact body which has for so long a time been so successful in making contracts for the use of asphalt. One great trouble with the manufacturers of paving brick hitherto has been that they were not fully conversant with their own material. All did not agree upon the same statement of facts. When that is true the public is naturally suspicious. But with such information as came before the recent Convention all feelings of doubt and uncertainty must naturally be set aside.

One of the most creditable episodes in connection with the history of the National Brick Manufacturers' Association is its relation to the department of clayworking and ceramics in the Ohio State University. It is not usual that men engaged in practical affairs hold in proper estimate a distinctly technical institution of this kind. The millers of this country did a little

talking for a time about forming a milling school. If they had done this it would no doubt have saved them millions of dollars in foolish individual experiments. The glassmakers have discussed the same question; but the brickmakers, without circumlocution, have given their support and sympathy to the school under Professor Orton, which is located at Columbus. Their recent action in appropriating \$250 for the continuance of the work inaugurated by Professor Orton is a step in the right direction, and we believe that in the future the School of Ceramics will receive still greater support and encouragement from the National Brick Manufacturers' Association.

THE BADGE OF MEMBERSHIP.

The souvenir badge presented to the visiting craftsmen by the Buffalo brickmakers is one of the prettiest that we have had. It is in the form of a button, and as such is intended for permanent use. The ribbon, being easily detached, was meant only for decorative purposes and to make the badge more conspicuous during the week of the Convention. It served its purpose well, for with this badge in sight, wherever one might go he was sure to receive as much attention as is due a prince of royal blood. We opine that every visitor will preserve this little souvenir as a reminder of one of the happiest events of the year. What an interesting story a complete collection of N. B. M. A. badges tell to the older members. As we look at them what a flood of pleasing recollections come to mind. The faces of those whom we met for the first time at this or that particular Convention come before us as in a dream, and as we fondle the little mementoes and conjure over the pleasures and friendships inseparably associated with them we instinctively say, God bless this noble band of good fellows, each and every one, and prosper their cause and labors.



PRESIDENT MORRISON'S TIMELY SUGGESTIONS.

The address of President Morrison was all that it should be. The view of the business situation was hopeful. He looked for a fair demand for our product during the coming year, and, with others, looked forward to several years of active business. He called to mind the fact that it was every man's duty to start the ball rolling; that it was possible for the Convention to do its part in restoring confidence.

As to the matter of competition, Mr. Morrison said that, while competition might be the life of trade, on the other hand there might be such a thing as overdoing it. He said that if in the wisdom of this Association there could be evolved a scheme with sufficient elasticity to meet varying conditions of different localities that would prevent competing brickmakers from forming a mutual society for the extinction of profits it would be hailed with joy as a benefactor by thousands of struggling brickmakers.

The retiring President also called attention to a subject which has been under discussion not a little during the past year, "Can we increase the demand for our product in opening new fields for our wares?" He took up the line that we should

especially try to reach the home builders and impress upon them the importance of using fire-proof material in the construction of their buildings.

HEARD IN THE LOBBIES.

In walking around through the lobbies of the hotel one could hear many things in commendation of the spirit of the Convention. Some said: "We had the best time we ever had;" others, "We had more fun in Buffalo than we had at any previous Convention;" another, "I have been to a good many Conventions, have been in the brick business a good many years, and always thought I knew what I was doing, but I believe I go away from here with more knowledge than I ever gained from 'a convention.'" An old member was heard to say: "This Convention has done more for the cause of paving brick than all other Conventions put together. The report of the Committee on Standard Specifications and that of Professor Orton on tests are so complete and satisfactory that they should bring about a revolution."

The speaker was right. There has been in the past a sort of a shotgun policy with respect to the manufacture of paving brick, which has left little that was tangible for any of us to look at. Nevertheless, the movement in the direction of better things has been studied, and the brickmakers of America are to be congratulated upon the spirit which pervaded the Eleventh Annual Convention. All should read the reports of the Convention carefully, word for word. Not only read, but think about what has been said; remember the spirit which has pervaded other Conventions, and bear in mind that all that may be done and the best that may be done is to consider seriously the material which has been presented to this body; make it as public as possible; give the people to understand that what has been done has been seriously done, and in the end the work of this body cannot but redound to the credit and help of all.

ENAMELED TERRA COTTA.

On another page is an illustration of an exhibit of enameled terra cotta made in the exhibition room at Buffalo. There has been a demand for this sort of ware, and, with the ability to furnish it, there can be no reasonable question as to the market for it. Enameled terra cotta has been used in a few of our tall structures, but it has not been generally recognized as a material that is firmly established in the market. Certain experiences with it have not been satisfactory. But this is always true at the outset with the manufacture of a relatively new product. With the introduction of enameled terra cotta there is an opportunity for the development of a polychrome architecture. There are a number of architects in the country who are disposed to erect great commercial structures and other buildings in which there will be a liberal use of varying color. This will apply not only to the exterior, but to the interior. A great deal of interior work in color is done in a temporary and often an expensive way. Frequently the walls are laid up with brick or hollow tile, then plastered, then covered with tile. Why could not this work be done at once, say with blocks of enameled terra cotta? When these blocks were put in the operation would be finished. Why could not the inside as well as the outside of brick walls be finished at once, and not by subsequent laborious and costly operations? The application of tile to wall surfaces without bond is never wholly satisfactory. But with the enameled terra cotta or enameled hollow brick, whichever one chooses to call it, the decorative part of the building would be structural rather than applied, and we would have the decorative parts as permanent as the everlasting hills. Material of this kind could be used in the construction of mantels and fireplaces in a structural way by doing the work as the house went up. As it is, in building grates, fireplaces and mantels, the rough body is built up and the decorative tile work and material is applied. There is no reason why this work should not be made structural; that is, that the fireplace and mantel should be built in with the general structure of the building, and not plastered afterwards. With enameled material this is possible, as it is not soiled by contact with other building material, as is the case with porous structural products.

TABLE OF CONTENTS.

OFFICIAL REPORT.

Eleventh Annual N. B. M. A. Convention.....	103
Mayor Jewett Tenders the Welcome of the City.....	106
A Builder's Welcome.....	106
President Morrisou's Address.....	106
Treasurer Sibley's Report.....	107
The Election and Installation of Officers.....	108
President Brush Takes the Gavel.....	108
A Pleasant Interruption.....	109
The Old, Old Story.....	110
Trade Conditions—General Discussion.....	111
A Charter Member's Regrets.....	113

SECOND SESSION.

Clay in Architecture.....	113
Clay as a Building Material—General Discussion.....	114
Clay Fire-Proofing.....	116
Difficult Problems in Brick-making.....	116
Committee on Resolutions.....	118
Seeing Buffalo on Runners.....	118

THIRD SESSION.

Requirements of the Trade From a Practical Standpoint.....	118
Marketing Press Brick—General Discussion.....	119
Which Principle is Better for Burning Common Brick—Up-Draft or Down-Draft.....	120
Theory and Practice in Burning Brick.....	122
Hard vs. Soft.....	122
Is it Best to Leave Furnace Door Open When Watersmoking or Drying Off a Kiln of Green Brick?.....	123
Composition of Efflorescence.....	124
Circulation and Low Temperature.....	125
Is it Practical to Set Stock or Pressed Brick Flat to Avoid Fire Marks?.....	126
What is the Best Construction of Walls for Down-Draft Kilns?.....	126
What is the Best Arc of Circle for the Crown of an Oblong, Square, Down-Draft Kiln?.....	127
Under What Conditions is the Tight Floor of a Down-Draft Kiln Better Than the Perforated Floor, and Vice Versa.....	128
What is the Cause of Black Cores in a Red Brick Which is of a Normal Color Outside?.....	128
The Clay Resources of New York State.....	128
The N. B. M. A. As An Educator.....	129
Technical Education for Clay-workers.....	130

FOURTH SESSION.

Brickmaking—Old and New.....	132
Some of the Essentials to Success in Making and Marketing Paving Brick.....	134
Fire-Proofing.....	134
An Investigation of the Effect of Structure on the Wearing Power of Paving Brick.....	136
Is it Most Profitable to Dry Brick Before or After They Are Set in the Kiln?.....	138
Should a Brick Plant Be so Constructed as to Utilize Natural Heat for Drying During the Summer Season?.....	138
Is it Advisable to Combine the Manufacture of Roofing Tile and Brick? Can it Be Done Without Much Extra Expense.....	138
Can Whitewash be Prevented From Coming on the Surface of Green Brick by Varying Its Treatment in a Drying Tunnel.....	140
When, If Ever, Is The "No Admittance" to Brick Works Advisable?.....	141

FIFTH SESSION.

Brick Statistics.....	141
Success in Business as Affected by Geographical Conditions and Lack of Mutual Understanding.....	142
Local Organization.....	144
Is a Vitrified Brick Suitable for Building Purposes?.....	145
What Must Brickmakers Do To	

Be Saved From Bankruptcy?.....	146
Where Can Paving Brick Be Sorted to the Best Advantage, in the Kiln or in the Yard?.....	146
What will Be the Effect Upon the Dry-Press Process of the Increasing Demand for Face Brick Made by the Mud Process?.....	146
Capital Sunk in New Brick Plants—Can It Be Prevented?.....	146
Are Brick Dwellings Cheaper in the Long Run Than Frame Houses? How Can We Demonstrate the Fact to Home Builders Most Effectively?.....	149
Does It Pay to Soak Clay Which Has Been Ground and Screened Before Pugging It, Where the Product is Still Mud Brick?.....	150
Report of the Commission on Paving Brick Tests.....	150
Specifications for the Standard Method of Conducting the Rattler Test on Paving Brick.....	152
Specifications for a Standard Method of Conducting an Absorption Test on Paving Bricks.....	153
Report of Committee on Resolutions.....	154
Letters From Absent Members.....	154

THE POWWOW.

Welcome Address.....	156
J. C. Adams's Address.....	156
All Together.....	159
List of Members.....	159
Executive Committee.....	159
Roll of Honor.....	160
Local Entertainment Committee.....	160
Friday at the Falls.....	161
The Machinery Annex.....	161

CORRESPONDENCE:

A Broad-Minded View.....	161
Pleasant Convention Memories.....	162
Impression of a New Member.....	162
The Spirit of Progress.....	162
A Charter Members Opinion.....	162
Congratulations From One Who Has Been There Before Many a Time.....	162
"The Brickmaker to the President" Tells of the Good Time He Had at Buffalo.....	162
Thoughts Since the Convention.....	163
Ohio Valley News.....	163
Improvements in Stiff Clay Brick Machines.....	164
Agrees to Disagree and be Friendly.....	188
The New York Market.....	188
Pacific Coast News.....	190
From "Way Down South".....	190

ILLINOIS ASSOCIATION.

Mayor Tunnell's Address of Welcome.....	166
President Annual Address.....	167
The Preparation of Clay.....	168
Clay Cisterns and Cyclone Caves.....	168
A Well Planned Factory.....	168
Coal vs. Oil.....	169
Committee on Resolutions.....	169
Election of Officers.....	169
The Banquet.....	170
The Trip to the Brickyards.....	170
List of Members.....	170
"Andy" Harrington at Home.....	170
The Ohio Convention.....	170

EDITORIAL:

Convention Echoes.....	171
A Good Convention.....	171
The Powwow.....	172
Clay Fire-Proofing is Fire Proof.....	172
Brick Pavements Best.....	172
Clay in Architecture.....	172
Valuable Technical Work.....	172
The Badge of Membership.....	173
President Morrison's Timely Suggestions.....	173
Heard in the Lobbies.....	173
Enameled Terra Cotta.....	173
Trade Literature.....	184
Editorial Notes and Clippings.....	186

MISCELLANY:

Rough Notes on Pottery.....	184
New Terra Cotta Works at Matawan, N. J.....	184
The Hydraulic Press Brick Manufacturers Meet in Convention.....	188
Manufacturing Clay Griddles.....	190
Petroleum Brick for Fuel.....	190

INDEX TO ADVERTISEMENTS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page.
Hilgeman H. B.....	102	The Chisholm, Boyd & White Co.....	96, 97
Progress Press Brick and Machine Co.....	187	The American Clay-Working Machinery Co.....	220, 221
Ross-Keller Brick Machine Co.....	100	The Fernholtz Brick Press Co.....	99
Simpson Brick Press Co.....	98	Whitney, H. O.....	102

Brick and Tile Machinery.

Adrian Brick & Tile Machine Co.....	203	Steele, J. C., & Son.....	203
Anderson F'dry & Mach. Wks.....	213	Tallcot & Co., W. E.....	211
Baird & Son, H. C.....	195	The American Clay-Working Machinery Co.....	220, 221
Brewer, H. & Co.....	201, 219	The Horton Mfg. Co.....	212
Central Machine Works.....	196	The Eastern Machinery Co.....	222
Chambers Brothers Co.....	93	The Henry Martin Brick Mach. Mfg. Co.....	217
Craycroft Benj.....	193	The Leader Mfg. Co.....	204
Chicago Brick Machinery Co.....	204	The Ohio Ceramic Engineering Co.....	191
Eagle Iron Works.....	196	The Turner, Vaugh & Taylor Co.....	214
Freese, E. M. & Co.....	218	The Wallace Mfg. Co.....	189, 223
Frost Engine Co.....	215	The Wellington Machine Co.....	185
Hensley, J. W.....	194	Williams & Co., M. F.....	101
Kelis & Sons.....	195	Wiles, A. M. & W. H.....	202
Means & Co., Jas.....	198	Woolley Foundry & Machine Works.....	216
Michigan Brick and Tile Machine Co.....	199	Williams, White & Co.....	207
Newell Universal Mill Co.....	210		
Potts & Co., C. & A.....	103, 205, 210		
Raymond & Co., C. W.....	175		
Stedman's Machine Works.....	203		

Brick Kilns and Dryers.

Alsip, Wm. & S. H.....	208	Reppell, L. H.....	201
Conley & Wolfe.....	208	Sharer, Geo. W.....	94
Cummer & Son Co, The F. D.....	187	Swift, F. E.....	195
Eudaly, W. A.....	209	Thalson, A.....	193
Hundt & Co, F.....	197	The American Blower Co.....	198
Leary, W. A.....	200	The Fernholtz Brick Press Co.....	99
Morrison & Co., R. B.....	209	The Standard Dry Kiln Co.....	104
Pike, E. M.....	198	Wolff Dryer Co.....	224
Phillips, S. G.....	200		

Brick Yard Supplies.

Arnold, D. J. C.....	206	Mershon & Co., W. B.....	95
Buck, J. A.....	201	Newton, A. H.....	197
Coldewe & Co., G.....	197	Phillips & McLaren.....	199
Carnell, Geo.....	202	The Atlas Bolt & Screw Co.....	205
Cox, Geo. S.....	196	The Harrington & King Performing Co.....	95
Caldwell, H. W. & Son Co.....	193	Wagoner, M. V. B.....	199
Hardin, Bailey & Church.....	194	Walworth Run Foundry Co.....	202
Marion Steam Shovel Co.....	206		
Mey, F. H. C.....	194		

Miscellaneous.

Allis, F. H.....	195	Main Belting Co.....	200
Associated Trade & Industrial Press.....	200	Osborne, W. R.....	197
Balsley, G. S.....	198	Rochester Optical Co.....	196
Dean Bros. Steam Pump Works.....	196	Ropkey Mason Engraving Co.....	207
Dover Fire Brick Co.....	195	Tennille, A. F.....	197
Evans & Howard.....	199	The E. W. Vanduzen Co.....	196
Hicks, George C.....	198	The Union Hardware Co.....	197
International Correspondence Schools.....	196	The Jeffrey Manufacturing Co.....	198
Jackson, John H.....	198	The Rockwood Mfg. Co.....	197
		Small Ads., Wanted, For Sale, Etc.	

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

Deserves Its Success.

RAYMOND MACHINERY is an axis which turns money from the pockets of the brick consumer into the tills of those who use it.

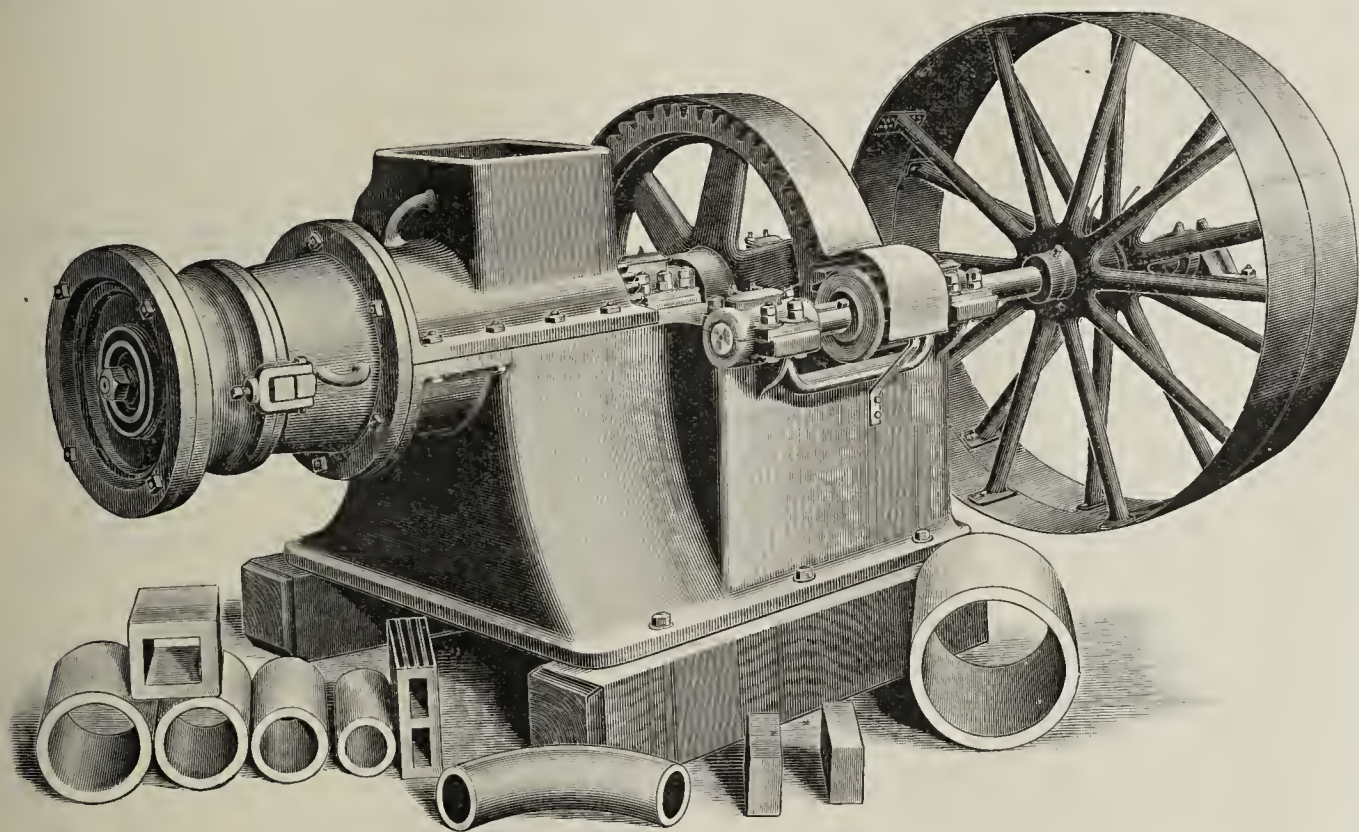
You never tried it did you?

You don't know, do you, whether it will pay or not?

Well, just try it and you will be amazingly tickled at results.

Look at This.

No. 3 DAYTONIAN BRICK AND TILE MACHINE,
Capacity 10,000 to 20,000 brick per day.



Automatic Power and Hand Represses, Automatic Cutting Tables, Pug Mills, Clay Separators, Crushers. Supplies, etc. Seven sizes of Brick Machines.

C. W. RAYMOND & CO.,

Send for 1897 Catalogue.

DAYTON, OHIO, U. S. A.

ROUGH NOTES ON POTTERY.

ROUGH NOTES ON POTTERY is the title of a very interesting work by Mr. W. P. Jervis, of Newark, N. J. It is copiously illustrated from rare examples and with many marks and monograms now first published. The price of the book is one dollar in leather, 50 cents paper covers.

The book does not pretend to be an exhaustive account of the history of ceramics, but the writer has given some interesting facts regarding the best known varieties, and in a manner to awaken an interest in this fascinating art. This work does just what it pretends to do. It gives an account, in a simple, direct and interesting manner, of many facts pertaining to the history and manufacture of pottery. In doing this the writer manifests sincere enthusiasm and interest in his subject. He indicates clearly enough that he has not exhausted himself in this work, and that his resources are abundant. It bears evidence of accuracy, and at the same time shows the picturesque of diction which will render it a popular work. First, there is a short account of the antiquity of pottery, followed by a general resume of the early history of English pottery. Under the heading of "Staffordshire," Mr. Jervis gives a very interesting account of the life of Josiah Wedgwood. In presenting this account, he gives not only an account of his work, but shows a sincere appreciation of the high character of one who did so much for English pottery. Next there is the account of the work of Minton, followed by a mention and short history of other English pottery workers. This book contains a very pleasing account of American historical earthenware. Following the record of these earlier workers, an account of more modern producers is given. Among these is the work of John Maddock & Sons, the Caughley-Coalport establishment, that of Doulton and others, many of which have an early origin, though their work has been carried forward into recent years. Different kinds of ware, glazes, finishes and decorations are clearly described. The following parts of the book consider the pottery of France in its various sections, Italian majolica and other Italian wares, as well as those of Germany, Austria, Holland, Sweden, and a short account of the ware of China and Japan. Of American wares this work treats only of that of the Rookwood Pottery, of Cincinnati. The writer states that it was his original intention to give a more extended consideration to American pottery, but as the subject widened he reached the conclusion that he could best serve American interests by devoting a book to that subject alone. The section devoted to marks and monograms will be of especial interest to those having knowledge of this art.

Notwithstanding its unpretentious character, this book contains so much that is new and valuable that no student of ceramics can afford to be without it. Much has been written about Belleek, but it seems that our information was all wrong, not alone as to its origin, but as to the nature of the ware itself. The story of the Limoges factories is much fuller than any yet written, and will no doubt form the basis from which future historians will work. Until now we had always regarded the second Spode as the inventor of bone china, a mistake the best writers on ceramics have perpetuated. These are but a few evidences of the touches of originality found in its pages, and that will in time be recognized and make of it a standard textbook.

TRADE LITERATURE.

WE ARE INDEBTED to the Standard Dry Kiln Company, Indianapolis, for a morocco-bound copy of their sectional catalogue, No. 35, which tells of their improved natural draft brick and tile drier. The book is beautifully printed, and contains a large number of fine half-tone illustrations of brick and tile factories using the Standard drier. They will gladly send a copy to any reader of the Clay-Worker asking for it.

"THE VOICE OF EXPERIENCE" is the title of a handy little pamphlet received from the Eastern Machinery Company,

New Haven, Conn. It chronicles many voices, the experience of each being very flattering to the "New Haven" brick machines. If you want to know more about it write them for a copy.

C. W. RAYMOND & CO., Dayton, O., have favored us with a copy of their 1897 catalogue, which is a large and attractive book of 126 pages. The cover is exceptionally neat and appropriate, being a rich terra cotta color, the title being embossed without ink, making a pretty effect. Inside the book is carefully arranged an index giving the numbers of the pages on which may be found cuts and descriptions of their various equipments, which include a full line of stiff clay brick and tile machinery and brickyard supplies. A copy can be had for the asking.

THE WOOLLEY FOUNDRY AND MACHINE WORKS, Anderson, Ind., are out with a new catalogue devoted to their clayworking machinery. Like everything connected with Mr. Woolley, the work has a substantial appearance. In addition to the engravings of the Iron King brick machine, Woolley Dry Pans, slip pump, filter press, clay crushers and all kinds of brick and tileyard supplies, there is a bird's-eye view of their new factory, which indicates exceptional facilities for the production of heavy machinery. A copy will be mailed free to any address.

"THE NEW SOUTH" Brick Machine is very fully described and illustrated in a neat little catalogue recently issued by J. C. Steele & Sons, Statesville, N. C. They are also the manufacturers of a patent brick truck that is commended very highly by users, being peculiarly suited to small stiff clay brick plants. It, too, is illustrated in the catalogue, a copy of which will be mailed free to any of our readers.

"BRIQUETTING FLUE DUST AND FINE ORES" is the title of a brochure issued by the Chisholm, Boyd & White Company, Chicago, in which is set forth the merits of a "Boyd Ore Press," which they have patented, and which, with "The White Mineral Press," is becoming very popular in the mining districts, where they perform important functions. Any of our readers who are interested in mining and smelting ores or precious metals will find use for this little book.

TAPLIN, RICE & CO., Akron, O., are sending out a little pamphlet devoted to their clay-crushing machinery, consisting of a series of dry and wet pans. They also show a new jolly for manufacturers of pottery ware, which, they think, is a decided improvement over the old style machine.

NEW TERRA COTTA WORKS AT MATAWAN, N. J.

The enamel brick works of Messrs. Rue & Co., at Matawan, N. J., were closed several months ago under foreclosure. They remained idle until Dec. 1, when they were again opened for repairs and changes incident to being operated for the manufacture of architectural terra cotta.

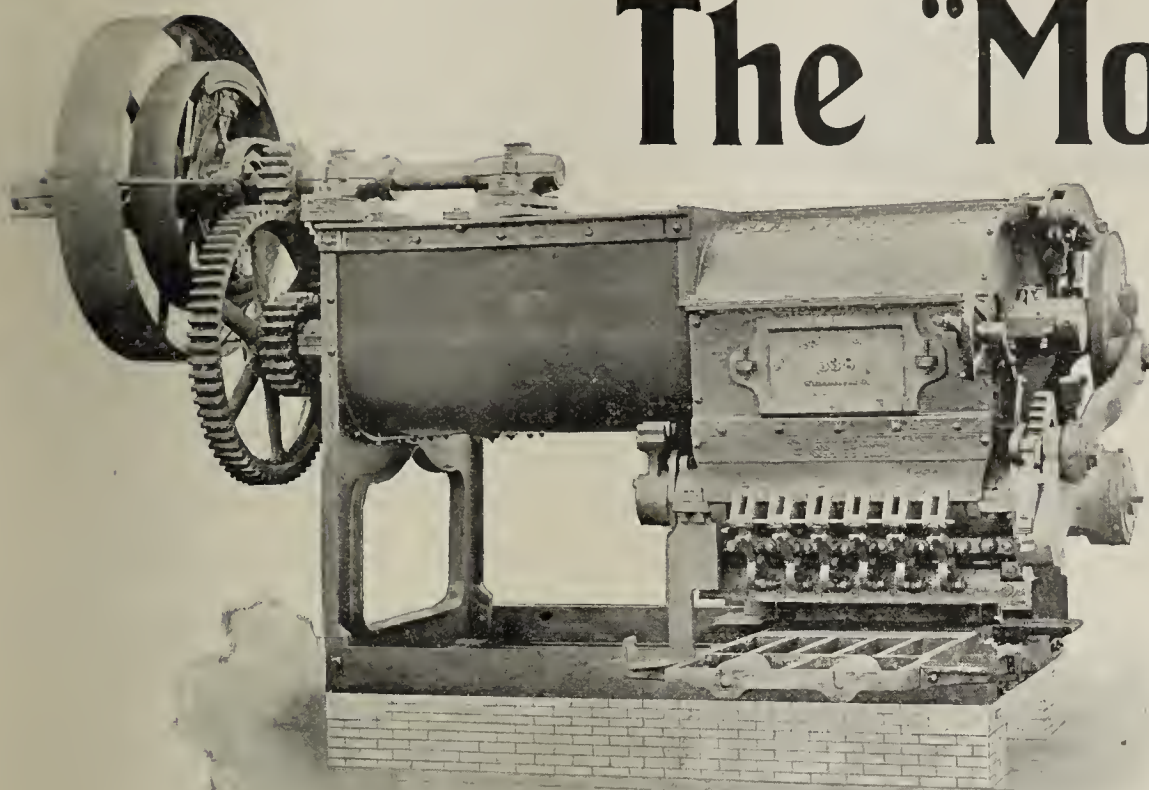
The new proprietors are Karl Mathiasen & Co. This enterprising concern is composed of young men, who have won a considerable share of success and reputation as terra cotta makers in the Eastern States. Their works were at Trenton, N. J., but that factory has for many months been inadequate for the necessities of their rapidly increasing business. The Matawan factory will greatly enlarge their facilities, and will doubtless prove of great benefit by enabling them to fill their orders promptly. The product of this firm is rapidly forging its way into the front ranks of the Eastern market for terra cotta.

Karl Mathiasen is the General Manager. His experience has been thorough, dating from 1880. In 1882 he was a foreman in the Boston Terra Cotta Works, and in 1886 he entered the New York Terra Cotta Works as foreman of clayworkers. In both these positions he was under the instruction of James Taylor.

In 1888 he organized the terra cotta works of Mathiasen & Hansen, at Perth Amboy, N. J., which, in 1893, was incorporated under the title of the New Jersey Terra Cotta Company. This company has been very successful, and is a monument to the practical ability of the managers.

Alfred Yates and G. R. Twichell are the Boston agents. The New York office is 108 Fulton street.

The "Monarch"



(Horizontal,
Double Pug Mill,
Double Press.)

... and ...

—• THE •—

"Iron Quaker" Brick Machines

Lead the "Sand=Moulding" Class.

AUXILLIARY
MACHINES
AND . . .
SUPPLIES.

Pug-Mills, Disintegrators, Crushers,
Mould - Sanders, Represses, Winding
Drums, Dump Cars, etc., Moulds, Dump
Tables, Dryer Cars, Kiln Doors and Cast-
ings, Elevators, Dump Carts, etc., etc.



Ball=Bearing Brick Barrows and Trucks.

No one else makes them.

FOR SALE.

Odd sizes of moulds. Have not been used.

5 moulds, $8\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitlions.
20 moulds, $8\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 in. partitlions.

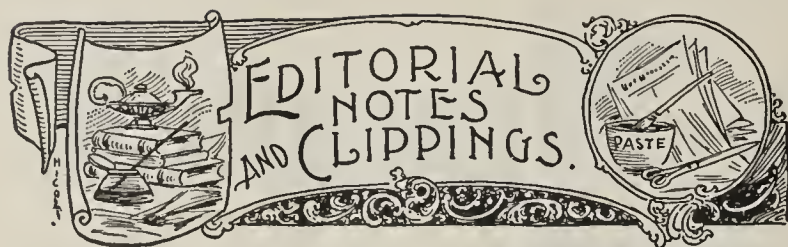
Second-hand, but used a few days only.

10 moulds, $9\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitlions.
19 moulds, $9\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{3}{4}$. " "
12 moulds, $8\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitlions.

The Wellington
Machine Co.,

WELLINGTON,
OHIO.

Send
for
Circular.



A new brick plant is to be started at Shoshone, Ida.

J. A. Littick, Laomi, Ill., is in the market for a second-hand pottery machine.

R. B. Wright, of Anniston, Ala., will manufacture brick at Yazoo City, Miss.

Jacob Boltz has purchased the brick plant of Jos. Fleischhut, at Pottsville, Pa.

J. K. Brodie, England, Ark., wants to buy a good second-hand tempering wheel.

C. J. Prah, Northport, Wis., would like to receive prices on brick machines, molds, etc.

Eugene Lamb, a brick manufacturer of Aberdeen, S. D., died Jan. 12, in his fiftieth year.

W. C. Swen and Geo. Tolman have formed a company at Eldora, Ia., where they will start a pottery.

F. W. Hymau, of Paulding, O., writes that he is in the market for a quantity of vitrified sidewalk brick.

Castor & Co., Princeton, Ky., say they desire to purchase a machine for manufacturing roofing tile, siding, etc.

F. G. Lotterer, Fort Scott, Kan., desires to purchase a good, long stiff clay pug mill, with a gate, either new or second-hand.

Jas. Brown, Jr., of Mattoon, Ill., expects to go to Como, Miss., in the near future, where he will establish a brickyard.

The Pressed Brick Works, Canandaigua, N. Y., which have been shut down for the past month, have resumed operations again.

S. E. Comb & Sons will embark in the brick business at Mechanicsburg, Ill., and would like to receive catalogues, price lists, etc.

Preparations are being made to start up the Brookfield (Mass.) Pressed Brick Company's works, which have been idle for some time.

John M. Leasc, M. D., is going into the brick business at Little Mountain, S. C., and desires to purchase a cheap outfit for making brick.

Chas. Evans has sold his interest in the Vassar (Mich.) Brick and Tile Company to Frank Miller, who is now sole owner of the plant.

The Henry Martin Brick Machine Manufacturing Company, of Lancaster, Pa., have just made a shipment to Venezuela, South America.

W. P. Jones, Reagan, Tex., advises us that he expects to start a brick plant, and would like to receive catalogues of horse-power machines.

J. W. Bales, in a recent letter, asks for sample copy of the Clay-Worker, and says he expects to go into the brick business in the spring at Salem, Ia.

Koeche Bros., Nauvoo, Ill., expect to enlarge their brick plant in the spring in order to enable them to manufacture brick and tile on a large scale.

Wallace Blair and Jno. Pender expect to operate a new brickyard at Northwest, O., in the spring. They expect to manufacture brick on a large scale.

The White Haven Brick Company will greatly improve their plant at Hazelton, Pa., so as to have a greatly increased capacity by the time spring trade sets in.

The Henry Martin Brick Machine Manufacturing Company are out with their new illustrated catalogue for 1897, and it should be had by every brickmaker.

W. E. Tallcot & Co., who are among the oldest manufacturers of brickmaking machinery in this country, show cuts of some up-to-date back machines on page 211.

Meyersholtz & Sons are making improvements in their plant at Napoleon, O., putting in new machinery, etc., that will enable them to greatly increase their capacity.

A. L. Taylor, President of the Commercial Club of Iola, Kan., in a recent letter says that the citizens of Iola are very anxious to have some one start a brick plant at that place. He will be pleased to correspond with any one looking for a site for a brick plant. They have had the clay in that vicinity tested,

and it has proven suitable for both paving and building brick. Any one going into the business there will find a good demand for his product.

Andrew J. Voight, of Armington, Mont., who has discovered an excellent bank of fire clay on his property, is getting things in shape to manufacture fire brick in the spring.

The Kirkham Art Tile Works at Akron, O., which was destroyed by fire some five years ago, will be rebuilt, and they expect to have the plant ready to begin operations by May 1.

The Joshua Oakes & Sons Drain Tile and Red Brick Company, of Haverhill, O., has been incorporated, with \$15,000 capital, by Joshua Oakes, Oscar F., Elmore and Frank E. Oakes.

The death of David S. Willys, a member of the firm of Willys & Hollis, brick manufacturers, of Canandaigua, N. Y., occurred Jan. 16. A wife, son and two daughters survive him.

J. N. Ward & Sons will move their plant from the south side of Turtle creek, Versailles township, to the East End, Pittsburg, Pa., as the former location was not deemed satisfactory.

The Rantoul (Ill.) Brick and Tile Company has been dissolved by mutual consent. J. B. Meneley will conduct the business in the future, H. J. Stefler and H. West retiring from the firm.

The plant of the Thompson Pressed Brick Works, at Boulder, Col., which is being reconstructed, is now almost completed, and the work of making brick will be commenced at an early date.

The Crown Cement, Lime and Brick Company has been incorporated at Baltimore, Md. The incorporators are Wm. Whitridge, H. C. Wagner, M. Whitridge and Jno. H. Thomas, all of Baltimore.

Mr. Frank Weber, of Perkasio, Pa., has placed his order with the Henry Martin Brick Machine Manufacturing Company, of Lancaster, Pa., for one of their latest improved horse-power brick machines complete.

A two-story wooden building, used as a tool house at Jno. J. Cooney's brickyard, at Malden, N. Y., was burned to the ground, causing a loss of about \$500. All of the tools used on the brickyard were stored in the building.

Geo. T. Munch, Glenville, O., writes for a sample copy of the Clay-Worker, stating that he contemplates erecting a large brick plant at that place, and wants to get pointers as to the best machinery and appliances to purchase.

The Danville (Pa.) Fire Brick Company is making arrangements to place their new plant in operation in the near future. The plant, which is fully equipped with modern machinery, will have a capacity of 10,000 brick daily.

D. G. Loomis & Sons, the enterprising brick manufacturers of Sherbrooke, P. Q., Canada, have added to their interests by purchasing the brickyard, including all appurtenances and stock on hand, of Clark Gordon, at that place.

W. T. H. Barr, a brick manufacturer of Hagerstown, Md., died at his home in that city Jan. 16. He was a man who had the faculty of making and holding friends, and his death is mourned by the entire community in which he lived.

R. C. Remney & Son, Philadelphia, Pa., are going to make improvements in their large brick plant. Among other things, they will put in a large brick drier, which will greatly facilitate their work and enable them to increase their capacity.

F. W. Katterjohn, Sr., the head of the brick manufacturing firm of F. W. Katterjohn & Co., Paducah, Ky., died of bronchitis Jan. 21. Mr. Katterjohn was born in Prussia in 1827, but has lived in Kentucky since he was fourteen years old.

Mr. John W. Hill, the celebrated consulting engineer, has associated himself with the C. & H. & D. Traction Company as consulting engineer to advise on the practicability of the use of compressed air as a motive power for their inter-urban service.

The Merrimac Ceramic Company has been organized for the purpose of manufacturing and dealing in brick, tile and pottery at Portland, Me. They have a capital stock of \$50,000. Thos. S. Nickerson, of Newburyport, Mass., is President of the new firm.

The large plant of the American Brick and Tile Company, near Phillipsburg, N. J., was completely destroyed by fire Jan. 22. The loss is \$30,000, on which there is no insurance. The works have been idle for some time, and the origin of the fire is a mystery.

V. A. Lapeyre will put up a small but substantial roofing tile and terra cotta plant at Cairo, Ill., manufacturing, as he says, a roofing tile of his own patent, which, on account of its lightness, cheapness and durability, is sure to find a ready

[CONTINUED ON PAGE 188.]

THE CUMMER DRYERS, For Drying Brick and Clay.



Using the mingled products of the fire and air or hot-air alone.
Both systems equally economical.

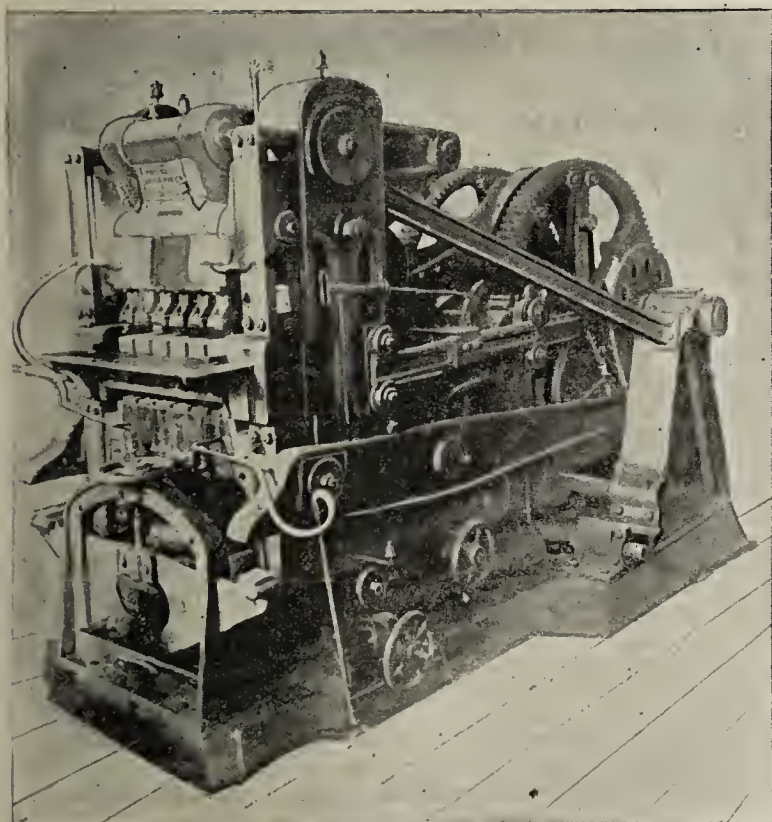
No Boilers. No Pipes. No Complications.

Great Capacity. Extreme Economy.

If we knew your Address, we would Send you a Catalogue.

The F. D. Cummer & Son Co.,
CLEVELAND, OHIO.

The PROGRESS BRICK PRESS.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE
ON APPLICATION.

Progress Press Brick and Machine Co.,
King's Highway and Oak Hill R. R. **ST. LOUIS, MO.**

EDITORIAL NOTES and CLIPPINGS—Continued.

market. He would be pleased to receive catalogues of machinery and other necessary equipments for such a plant. His address is, care of Uncle Joe's Hotel, Cairo, Ill.

Mayer Bros.' Pottery, at Beaver Falls, Pa., which was destroyed by fire some time ago, will be rebuilt at once. It is their intention to make the buildings fire-proof this time, so they will all be built of brick. They expect to have the plant ready for occupancy by April 1.

Aaron W. Haines, senior member of the firm of Haines & Son, brick manufacturers, of Yorktown, N. J., died in that city Jan. 8, after a lingering illness of two years. Mr. Haines was in his sixty-sixth year, forty years of that time having been spent in the clay business.

Miller & Douglas, Wellsville, Cache Co., Utah, advise us that they are in the market for a small horse-power soft mud machine, with a capacity of about 1,000 brick per day, twelve molds and two four-mold trucks. They will be pleased to receive catalogues and price lists.

The organization of brick manufacturers of Milwaukee, Wis., known as the Milwaukee Building Material Company, which has been in operation for several years, has gone to pieces. The members say they simply agreed to abandon the combine and each one make his own price.

The foundry building of the Woolley Foundry and Machine Works, Anderson, Ind., was destroyed by fire the 27th ult. Mr. Woolley advises us that they made temporary repairs on same which will last until spring, when they intend to build a brick building for their foundry department.

H. Fisher, of Lee, O., in sending subscription for the Clay-Worker, advises us that as the result of a big fire at that place they are badly in need of brick, and that he is going into the brick business and desires to purchase some good second-hand machinery suitable for common building brick.

The work on the new steam brick plant which is being erected by A. Meyer & Co., at Covington, Ky., is fast nearing completion, and they expect to be ready for operation by Feb. 15. The works will be the largest of the kind in that vicinity, and give employment to a large number of men.

Mr. John W. Beckett, of East Liberty Station, Pittsburg, Pa., put in a Martin latest improved brick machine in February, 1892, and being so well satisfied with the results obtained from it has just ordered one of Martin's letter "A" steam power machines, with all their modern improvements.

The City Council of Council Bluffs, Ia., is agitating the question of brick paved country roads, and while the Council itself has no jurisdiction whatever over the country roads, it is the intention to recommend such a course, and then do missionary work among the people in that vicinity and the Board of Supervisors.

In a recent letter A. C. Ochs, of Springfield, Minn., says: "I have quite a little trouble with my wires and wish to ask users of wire cut machines where the best wire for cutting of brick can be secured and that the name of same be stated. Please publish this question for me in the Clay-Worker and accept my thanks in advance."

There will be a new Pullman sleeping car put on the C., H. & D. Railway through car line between Cincinnati and Hannibal, Mo., commencing to-day. The name of the new sleeper is "Capri," and is fully up to the standard maintained by the Pullman Company and in keeping with the improved service of the C., H. & D. Railway.

The Purington Paving Brick Company, Galesburg, Ill., have closed a contract for 2,400,000 repressed paving brick for paving Ogden avenue, Chicago, 2,000,000 for paving Rogers Park boulevard, that city, besides two smaller contracts for same place and one for the city of Evanston, Ill. We trust this state of affairs will continue and become contagious.

At the annual meeting of the East Tennessee Brick Exchange, Knoxville, Tenn., the following Directors were elected for the ensuing year: W. H. Fizer, J. R. McCallum, J. F. Scott, D. G. Fuller and M. R. Grace. These, in turn, elected the officers, as follows: M. R. Grace, President; J. F. Scott, Vice President; D. G. Fuller, Treasurer, and Thos. Caldwell, Secretary.

At the annual meeting of the stockholders of the Nelsonville (O.) Sewer Pipe Company it was decided to at once rebuild their plant, recently destroyed by fire. They are now at work on plans for the new structure, and as soon as the weather will permit operations will at once be commenced on the construction of same. For the present they will abandon the sewer pipe business and direct their attention to the brick business. The buildings will all be of brick. They will put in a

tunnel drier and all the best and most modern machinery for their purpose. They will push the completion of their new factory as rapidly as possible.

An organization, to be known as the Hartford Branch of the Central New England Brick Exchange, has been formed at Hartford, Conn., and includes the following firms: Dennis & Co., Charter Oak Brick Company, Curtis & Douahue, Hartford Brick Company, S. H. Wilson, Capital Brick Company, M. Kaue and Cephas Dorr. F. A. Ward, of New Britain, has been appointed temporary Secretary.

S. W. Burnham, Lincoln, Neb., writes that he has come in possession of two well equipped brick plants at that place, the only ones he says within forty miles of Lincoln. And as he is not a practical brickmaker he would like to make arrangements with some one having experience in the trade who has some money to invest in a brick plant to take an interest in and manage the business. Mr. Burnham adds that Lincoln is one of the best towns in the west for a good brick plant, and that one who understands the business can make money.

AGREES TO DISAGREE AND BE FRIENDLY.

Publishers Clay-Worker:

Gentlemen—Inclosed please find \$2 for another year's subscription to the Clay-Worker, and I'm not tired of it. Although I don't agree with every article that comes under my notice, I must admit that there is enough of that which is good to more than counterbalance what I don't agree with, making it thrice welcome every time. GEO. E. DERRY.

La Prairie, P. Q., Canada, Feb. 2.

THE NEW YORK MARKET.

Mr. Leonard Cooper, successor to the firm of Benjamin Cooper & Co., Hackensack, N. J., died at the Pomeroy Hotel, New York city. He was taken to the Polyclinic Hospital for treatment. Mr. Cooper seemed the victim of peculiar destiny. On Christmas morning the hospital was entirely destroyed by fire. He was then taken to the hotel. Two days after fire broke out in the hotel, but was subdued without much loss.

—The Market—

Is slow, as the extreme cold weather has caused consumption to slacken. Shipments have ceased as well, so that it is an even thing. There will be no shortage in the market until navigation opens, as there are large supplies in the yards, as well as a half hundred or more barges under cover for sale at an increased rate—if that long looked for occasion ever reaches the market.

The following prices for midwinter brick is enough to give one a chill: \$4.50, \$4.75 and \$5; Jerseys, \$4.25 and \$4.50. Will it be a lesson? A. N. OLDTIMER.

THE HYDRAULIC PRESS BRICK MANUFACTURERS MEET IN CONVENTION.

THE ANNUAL CONVENTION of general managers of the various branches of the Hydraulic Press Brick Company, of St. Louis, Mo., was held in that city Feb. 8 to 11, in the main hall of the Mercantile Club. The various plants of the company, located in the following cities, were represented: St. Louis, Chicago, Minneapolis, Omaha, Kansas City, Findlay, O., Cleveland, Rochester, N. Y., Philadelphia and Washington, D. C. The yearly gatherings are important to the company from the fact that they bring together representatives of leading industries covering a large section of the country. The reports of the managers of the general conditions prevailing, as made to the meeting, declare that the outlook for the coming season is very much better than has been experienced in the past two years, and a general revival of the building interests may be fairly expected. Mr. E. C. Sterling and Mr. H. W. Eliot, as President and Secretary, respectively, of the parent company, hold the same offices in the various branch companies, and the proceedings of the Convention are conducted under their direction. The combined product of the companies represented by these gentlemen, it is said, now amounts to more than 300,000,000 pressed bricks annually, and the capital invested in the various companies exceeds \$13,000,000. Mr. G. F. Baker has had charge of the arrangements of the Convention, to whom, as well as to the other officers of the company, the success of the meeting is largely due.

Among the interesting subjects for discussion was the "Chemistry of Clays," on which a very able address was made by Mr. W. M. Chauvenet, in which he took up this very broad question and explained the characteristics of the large number of clays worked by companies in all sections of the country in their relation to the actual manufacture of bricks.



The BUFFALO CONVENTION was a

Decided Success

— Says Every One.

IN this it Resembles the "Wonder" Machinery Illustrated on the back inside cover page. Each and Every "WONDER" BRICK AND TILE MACHINE is a DECIDED SUCCESS.

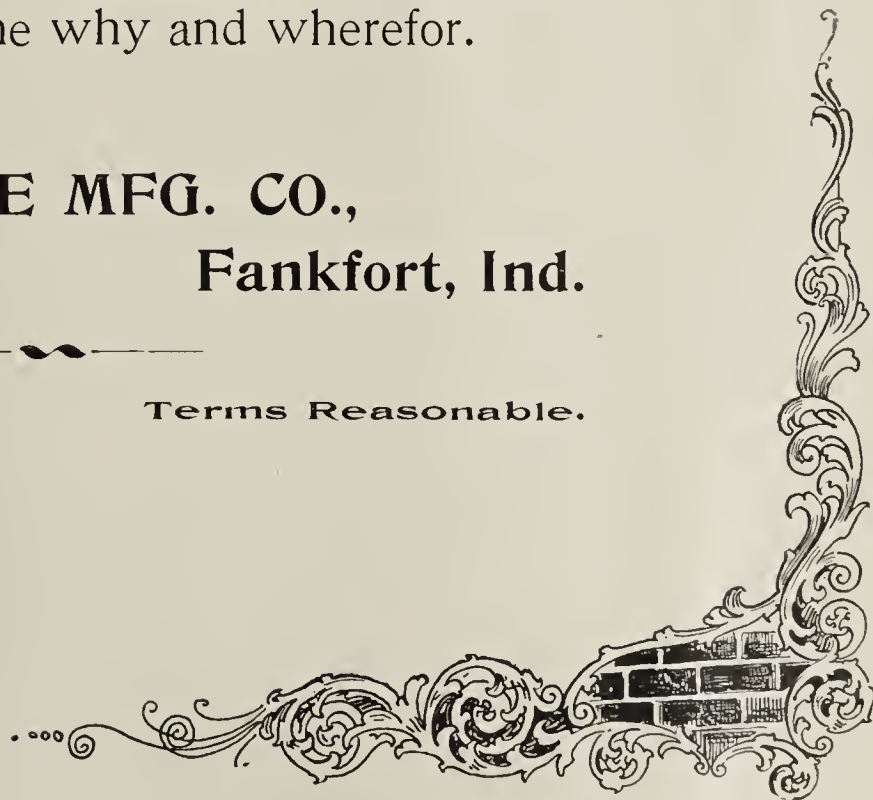
Let us tell you the why and wherefor.

WALLACE MFG. CO.,

Fankfort, Ind.

Prices Low.

Terms Reasonable.



PACIFIC COAST NEWS.

San Francisco, Feb. 3, 1897.

The brick and terra cotta men report that there is hardly anything being done in their line and no new contracts of any consequence are being made. The rainy season has been on for the past two weeks and building operations have come to a standstill. The prospects for the spring are doubtful, but there are indications that there will be some good-sized building and sewer work. The filing of the recorded contracts for the Claus Spreckles building, on Market street, show that the exterior terra cotta and tile finish on the dome will be done by Gladding, McBean & Co. for \$47,415. Among the principal contracts in prospect is a five-story terra cotta building to be erected at Market and Eddy streets by the Barron heirs.

In Salt Lake, Utah, there has been less activity in the brick market than for several seasons prior to this. The demand has been for hard burned building brick and less for pressed. There have been some handsome residences built this season, however, several parties taking advantage of the extremely low prices of brick and other building material. The cheapness of material is the result of small demand and cheap labor. The market has felt the effect of a falling off of public work, while some increase has been shown in the demand for hard brick for smelter purposes, new mills being erected and extensive improvements made in some of the old ones. The building of schoolhouses in outside towns, together with a few new business blocks, brought about a small demand for pressed brick, generally of good quality. But few plants have been operating this season, owing to the cheapness of the product and the class of machine-made brick demanded. Some progress is understood to have been made in the manufacture of fire brick, and strong hopes are entertained that the coming season will so develop this branch of the brick industry that it will class with the successful products of other kilns and be able to supply our home market, while at this time a larger part of this class of brick are bought in other markets. There does not appear to be as promising a future for this industry for the coming season, as compared with the past, unless there should be a revival in the spring. It was estimated that there was a finished product of 3,450,000 brick on hand Jan. 1, 1896. The estimated product of 1896 is placed at 10,975,000, making a total of 14,425,000.

In September, 1893, the first vitrified brick street pavement was laid in Seattle, Wash. It was an experimental piece of work, and was laid where it should be subjected to very heavy traffic, which it has now had for nearly four years. A few days ago a strip of this pavement had to be removed to put in a sewer connection. This brought the brick to full view again, and an examination of them showed them to be as good as the day they were laid, the sharp corners on the brick alone having been worn off a trifle, practically bringing the brick to what is in some cases required—rounded edges—in the place of square edges, such as these brick had when they were put down. The life of this piece of brick pavement will be fully fifty years or more, based on its record to date, and it augurs well for the extensive brick pavements laid in Seattle during 1896.

The following officers have been elected by the Bricklayers' Protective Union of Los Angeles, Cal.: President, George Boehertz; Vice President, Bert Grates; Recording Secretary, J. W. Duehring; Financial Secretary, S. C. Gurnsey; Treasurer, Carl Robertson; Sergeant-at-arms, J. Hoffman; Trustees, Robert Hopf, J. H. Harmon and W. Coleman.

"Modern Mexico" says manufacturers of brick machinery in the United States should not overlook Mexico. Excellent deposits of clay are found in nearly every one of the Mexican States, and companies are being organized to develop this industry in nearly all of the leading cities. Two complete plants were shipped to Mexico last month from the United States. One of the most important contracts granted by the government last year was completed Dec. 24. By its terms Mr. C. C. Merrill, of Los Angeles, Cal., will establish in Mexico a vitrified sewer pipe factory. Mr. Merrill deposited a \$10,000 bond as a guaranty that he and his associates would invest \$400,000 in the enterprise. This factory will probably secure the contract for the pipe for the new sewers of the City of Mexico. The Laclede Fire Brick Company, of St. Louis, is interested in the Mexico plant, as is also Mr. Harry J. Neale, of Mexico City.

The South Bay Brick and Transportation Company has been incorporated in San Francisco, with a capital stock of \$200,000. The incorporators are W. J. Walcott, T. W. Petersen, Fred T. Petersen of San Jose, A. L. Fulton of Burlingame and George C. Ross of Belmont.

N. Clark & Sons, of Alameda, have issued an attractive calendar bearing a half-tone of their large pottery plant at that place. A. V. Clark, of this firm, recently had two fingers crushed under a pipe casting.

E. T. Maple, Superintendent of the Antioch Pottery, has made arrangements to give his new pavement a test in Stockton, Cal.

William Scharnhorst, a brick contractor, died recently at Riverside, Cal.

MANUFACTURING CLAY GRIDDLES.

Elmer Thomas, John Martin and Will Linton have leased the old Schofield Pottery kilns back of New Brighton, Pa., put up a wooden structure in which to work, and are turning out greaseless griddles. One kiln full of the goods has been turned out and is said to be satisfactory. The new griddles consist of circular plaques, made of clay, so prepared and burned that cakes may be fried on them without the use of grease. The clay is about three-fourths of an inch in thickness and is bound with a metal frame. The new griddle is heated in the same manner as the lid of a stove. What next?

PETROLEUM BRICK FOR FUEL.

According to the *Moniteur de la Papeterie*, Paris, Messrs. Holm & Hansen, Norwegians, have manufactured bricks of condensed petroleum for fuel purposes. They are claimed to produce four times as much heat as coal does, and to burn in a grate slowly and without liquefaction, producing a smokeless long flame of great intensity. A 25-gram brick costs 2 centimes and larger ones proportionately less.

FROM "WAY DOWN SOUTH."

Publishers Clay-Worker:

It is with pleasure we inclose you \$2 to pay our subscription to the Clay-Worker, a paper from which we derive much knowledge, and wish you a prosperous year for 1897, as well as for every succeeding year.

The brick industries in this section have had a hard year this 1896, a great many of us running only on one-half time, and then could not dispose of our product except at very low figures, so that we need a prosperous 1897.

SALMEN BRICK AND LUMBER COMPANY (L't'd).
Slidell, La.

The Granite Brick Works, at Middleport, O., makers of red and paving brick, have been in receivers' hands for some months, and are idle at present. The business and plant are in the hands of A. E. Fox, of that city, and no definite prospect of resumption is announced.

The Means & Russell Iron Company, of Ashland, Ky., engaged quite extensively in the mining of second-class fire clay on the lands of the old Belfont Furnace tract, below that city, will probably increase their facilities in the early spring, a heavy demand having sprung up at Cincinnati and other down-river points.

The Excelsior Sewer Pipe Company, at Elliottsville, O., are contemplating a new departure in the manufacture of enameled brick. They have an expert from Scotland, who claims to be able to produce an excellent enamel with one burning. If their experiments are successful they will at once remodel their plant and go extensively into the brick business.

Through the alleged dishonesty of the assignee of James Blakely, in Pittsburg, in 1857, the title of property in East Liverpool, O., valued at several millions, is questioned. The heirs have put their claims in the hands of attorneys, and notices have been served on the owners of over 150 lots in the business center that their titles will be questioned in court. Blakely was a wealthy Pittsburger, and owned extensive property interests here. He assigned, and it is now alleged that the title of the property was never transferred. Twelve of the largest potteries are built upon this disputed territory and are defendants in this suit.

CORRESPONDENCE invited with party capable of taking charge of plant for the manufacture of brick and drain tile by the thousands. Company will furnish plant, and money for fuel, labor, etc. Address
BRICK,
Care Clay-Worker.

21 d

FOR SALE—A brick plant, with a daily capacity of 20,000 brick; a modern, well-equipped plant, with dry floor 87 by 87. It is located on three railroads. There is an abundance of good clay and a fair demand for brick. Will be sold cheap. For full particulars address

21 x

McCORMICK,
Care Clay-Worker.

FOR SALE—A complete modern red brick plant, end and side cut brick, engine, boilers, Penfield machine, pug mill, automatic tables, repress and presses, 120 fine iron cars, with iron bottoms, also transfer cars. Will sell separately or as a whole. Address
W. W.
21p 1 Care Clay-Worker.

“Don’t Do a Thing Until You Hear From Us.”

Don’t purchase any machinery or apparatus for face brick work, either plastic or dry press.

Don’t buy any paving brick machinery.

Don’t buy any presses, for any purpose, or any molds or dies for ornamental brick.

Don’t build a dryer or kiln of any kind.

In fact, don’t decide upon any improvement pertaining to the art of brickmaking until you have first ascertained what we can do for you.

Our knowledge and experience are at your command.

If we cannot help you it will cost you nothing.

We are in this business to stay. Our facilities are unexcelled. We are building up a reputation for honest work and successful results.

Some of the largest and most prosperous pressed brick companies have benefitted by our service. You may do likewise.

Our prices are moderate and our work guaranteed.

Send us your address for our new Catalogue.

Watch this page for improvements in machinery, dryers and kilns.

With best wishes for the New Year,

The CERAMIC ENGINEERING CO.,

Office and Works 59-63 Center St.,

CLEVELAND, OHIO.

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cent a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE—Simpson Brick Press; good order. Address H.,
21 tf Care of Clay-Worker.

FOR SALE—One No. 1 Brewer Pug Mill. Only used two days. As good as the day it left factory. Price, \$225. Address
V. C. BADHAM,
21 c Columbia, S. C.

FOR SALE—One Four-mold Boyd Dry Press Brick Machine. This machine is as good as new, having been used less than three months. Address SHARP BROS.,
21 cm New Philadelphia, O.

WANTED—One second-hand Hammer Brick Machine; good order. State capacity, price and make.
M. KOMA, 3304 Shenandoah St.,
21 d St. Louis.

WANTED—H. Brewer Mold Brick Machine, No. 8 preferred; also, a Clay Disintegrator. Capacity, about 25,000 a day.
H. M. & A. ANDERSON,
21 c Barnesboro, Pa.

WANTED—Good second-hand Sword Brick Machine, small size. Must be cheap. Address
AMERICAN PRESS BRICK CO.,
Newstead & Wabash R. R., St. Louis, Mo.
21 c

FOR SALE—Two No. 4 J. W. Penfield & Son's, Willoughby, O., latest Improved Dry Presses. Been used but four months; in good order. Address
THE LORAIN BRICK CO.,
21 c Elyria, O.

FOR SALE—One Raymond Double Die Automatic Power Repress, one Sword Brick Machine, Pulleys, Shafting, etc. All as good as new. Only in use four days. Apply
BEAMER-LOVETT BRICK CO.,
21 2p Belton, Tex.

FOR SALE—A 30 years' old, well equipped Brick Plant, horse and steam power machines, Pallet system, gas or coal fuel. Reason for sale, failure of eyesight and old age. Write to
ANDREW STOLZ,
23 cm Meadville or Kerrtown, Pa.

WANTED—Situation as burner or foreman. Understands up or down-draft kiln, fire shale or clay and roofing tile. Over twenty years' experience. Can give reference if required.
T. F.,
21 lp Care of Clay-Worker.

WANTED—An established company of clayworkers desire to increase their capital from \$15,000 paid in to \$30,000, to work a new discovery of flint clay for the manufacture of fire brick. Address
C. W. C.,
21 c Care of Clay-Worker.

FOR SALE—Penfield Stock Brick Machine, latest improved, only used one month; 4,000 pallets and 7-foot wet pan. All very cheap. Address G. O. ROBINSON,
21 c Bellaire, O.

PAVING CONTRACT.

Sealed bids are hereby invited for the paving with vitrified brick and concrete foundation of the following streets:
Texas street, about..... 23,725.34 yards
Common street, from Texas street to Milam street..... 1,445.32 yards
Milam and Texas avenue intersection 963.1 yards
Texas avenue 105,859.7 yards

Making a total of about....129,990 sqr yds
Said work to be done according to specifications on file in this office. Said bids to be in the hands of the controller by 12 m. of Thursday, April 15, 1897. A certified check for \$1,000 to accompany each bid as a guarantee of good faith.
N. B. MURFF,
22 d Controller, City of Shreveport, La.

NO DRY PRESS Brick Plant complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 t f d Wellsburg, W. Va.

INDUCEMENTS will be offered reliable man to locate brick factory at Fortville. Good brick clay, natural gas and only 20 miles from Indianapolis. Address
LAND CO.,
21 d Fortville, Ind.

WANTED—A practical brickmaker wants a position as superintendent of a brick plant. Understands all the principles of making, drying and burning brick. Address
LOUIS,
21 c Care Clay-Worker.

FOR SALE—One (1) six-mold Grand automatic tempered clay brick press, one (1) horizontal pug mill, one (1) No. 2 Potts disintegrator, one (1) canvas belt elevator, three (3) set brick molds, six molds to a set, three (3) brick trucks, one (1) turn dumping table, pallets and racks for 75,000 brick. Can be bought cheap at my brickyard. Address
DUKE,
21 d Care Clay-Worker.

FOR SALE—Brick and Tile Factory. In operation now. Manufactures tile in winter and brick in summer. Has not shut down for eleven years, only for repairs. No competition. Reasons for selling. Patent Kiln Furnace to sell, as per ad in this Clay-Worker.
F. E. SWIFT,
21 L Washington, Ia.

Books for.. Brickmakers.

.....

CLAY GLAZES AND ENAMELS, By H. R. Griffen. The latest and best work on Enameling Brick, Terra Cotta, etc. Tells just how to do it. Price..... \$ 5.00

BRICKMAKERS MANUAL, By R. B. Morrison and J. A. Reep. Treats on making and burning brick in a plain practical manner. Price..... \$ 3.00

SIXTY YEARS A BRICKMAKER, By J. W. Crary, Sr. The lessons of a life long brick-maker told in an interesting and instructive manner. Price..... \$ 2.50

VITRIFIED PAVING BRICK, By H. A. Wheeler, E. M. An up-to-date book telling how and why Paving Brick should be made and used. Price..... \$ 1.00

TABLE OF ANALYSES OF CLAYS, By A. Crossley. Contains the analysis of most of the American and European clays. Price \$ 1.00

PRACTICAL FARM DRAINAGE, By J. J. W. Billingsley. Tells how to make, burn and salt glaze drain tile, and why tile drainage pays. Price..... \$ 1.00

.....

A Little Library for Clayworkers,

All these books mailed to one address, Postage prepaid, for . . \$ 10.00

.....

T. A. Randall & Co.,

PUBLISHERS,

5 Monument Place, INDIANAPOLIS.

Conveying, Elevating and... Power-Transmitting Machinery.

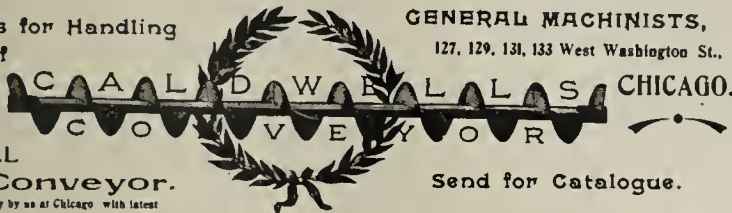
H. W. CALDWELL & SON CO.

Specialties for Handling
Material of
all Kinds.

GENERAL MACHINISTS,
127, 129, 131, 133 West Washington St.,
CHICAGO.

CALDWELL
Steel Conveyor.

Manufactured exclusively by us at Chicago with latest
improvements



Send for Catalogue.



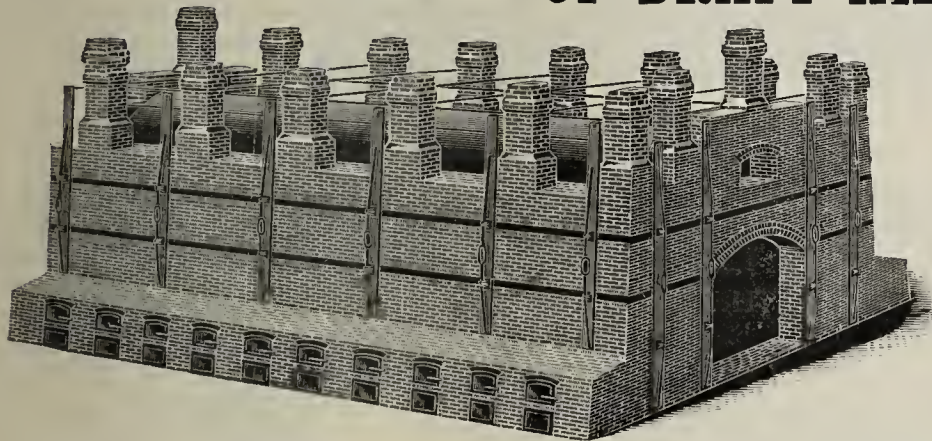
Caldwell Corrugated Seam-
less Steel Elevator
Buckets

LINK BELTING.
SPROCKET WHEELS.
COTTON BELTING.
RUBBER BELTING.
LEATHER BELTING.
BELT CLAMPS.
ELEVATOR BOLTS.
ELEVATOR BUCKETS.
CONCRETE MIXERS.
FRICTION CLUTCHES.
JAW CLUTCHES.
COUPLINGS.
FLEXIBLE SPOUTS.

GEARING (all kinds).
ELEVATOR BOOTS.
HANDERS.
PERFORATED METALS.
PILLOW BLOCKS.
IRON PULLEYS.
WOOD PULLEYS.
SHAFTING.
SET COLLARS.
SWIVEL SPOUTS.
TAKE-UP BOXES.
TURN HEAD SPOUTS.
WIRE CLOTH.



THE THAI SON LATEST IMPROVED COMMON SENSE UP-DRAFT KILN.



Do you make brick? And have you any trouble in burning them? If so, do you want a cheap constructed, simple and durable Kiln? One that will dry any brick without the assistance of Dryer or Fans, and in one-half the time. A Kiln where heat and draft can be changed to any part at will, and burn all hard brick, even and alike throughout, in less time, and with less fuel than any other, no up or down draft Kiln of any kind excepted. This is the Ideal Kiln for Dry Pressed Brick and the best on earth. Sure success with this Kiln. Call and see it at my works or for further information address,
Brick Manufacturer.

A. THAI SON, Laredo, Texas.

EAGLE BRICK MACHINE.

Steam and Horsepower.

THE BEST MACHINE IN THE MARKET.

The Horsepower Machine will make 17,000 to 20,000 brick per day; the Steam power Machine, 25,000 to 30,000.

These machines are sold on their merits, guaranteed to do first-class work.

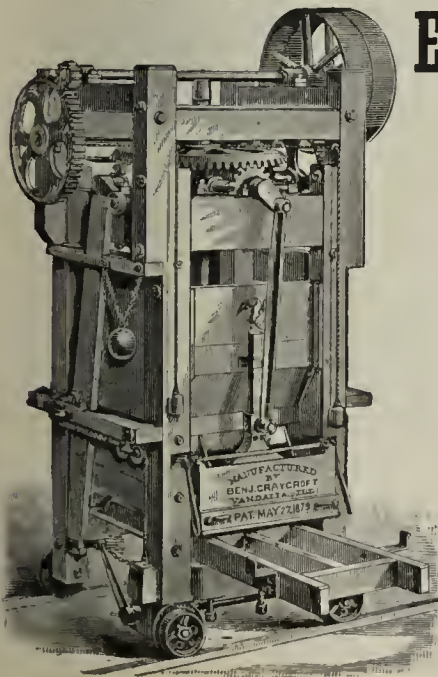
Brick moulds for hand and machine a specialty. Send for Circular

BENJ. CRAYCROFT,

Manufacturer,

Vandalia, Ills.

C. J. CRAYCROFT, Fresno City, Cal., General
Agent for Pacific Coast.



WANTED—Enameler wants position. Can enamel, "not slip and glaze," any bricks made of clay, superior to anything now produced. Will give positive proof of ability at own cost. Only reliable firms treated with. CLARENDON, 22 c
Care of Clay-Worker.

FOR SALE OR LEASE—On astonishingly low terms, a new, up-to-date Brick Plant, located at Quincy, Ill., built by an expert. Stiff Mud and Dry Press Machines, etc., etc. Address

C. ORCHARDSON, 77 Clark St.,
Chicago, Ill.

FOR SALE—CHEAP—One Brewer Clay Crusher and Stone Separator, overhauled, new gears and crushing rolls; also 12-foot Clay Conveyor, used very little. Price for both, \$175 cash f. o. b. cars, Augusta, Ga.

McCOY BRICK & TILE CO.,
Augusta, Ga.

WANTED—Situation by a practical manufacturer of Dry Press, Stiff Mud and Paving Brick, Fire Brick, Sewer Pipe, Fire Roofing. Can erect new or remodel old works. Able handler of men. The best of references furnished. Address

X.,
211 p
Care of Clay-Worker.

FOR SALE—One Eureka Dry Press Brick Machine, in first rate order, at a bargain; one straight-line Engine, 14 by 14, in excellent condition; one 8-foot Sturtevant Blower; eight 7-foot Drying Pans, good as new; five second-hand Horizontal Boilers, 50 to 60 horse power, 5 and 6 foot diameter; one Raymond Re-press, small size, hand power; 100 iron Bedsteads; one No. 2 Worrall Dryer; one large Disintegrator, suitable for clay and tile manufacturers; 3,000 Saggars, suitable for china and tile works, all of which will be sold at a bargain. Address

C. SIEDLER, Pres., 92 Liberty St.,
23 dm
New York City, N. Y.

FOR SALE—The W. S. Williams Brick Plant, situated one mile from Canton, O., on the Valley Railroad. There are thirty-two (32) acres of land connected with this plant, underlaid with clay and shale for street paving brick, and for quantity, quality, variety and accessibility of clays cannot be duplicated, special attention being called to the buff clay deposits for the manufacture of straw-colored brick and other articles, which is unequalled. Capacity of plant, 25,000 street paving brick per day. This property will be sold cheap and on reasonable terms.

R. S. SHIELDS,
Assignee of Wm. S. Williams.
23 dm
Canton, O.

RECEIVER'S SALE—Notice is hereby given that the undersigned, as Receiver of the DuBois Pressed Brick Company, will, on

TUESDAY, MARCH 16TH, 1897, at 10 o'clock a. m., at his office in the town of Greentown, Howard county, Indiana, sell at public auction, by virtue of the order and decree of the Circuit Court of Howard county, Indiana, the following described real estate belonging to said company, to-wit:

Commencing at the northeast corner of the southwest quarter of section 24, township 24 north, range 5 east; running thence west 2,062.05 feet; thence south 1,064.05 feet; thence northeast along the north side of right of way of the Toledo, St. Louis & Kansas City Railroad 2,184.53 feet; thence north 345 feet to the place of beginning, containing 33.33 acres, more or less, all in Howard County, Indiana, together with all buildings and machinery thereon situated, said machinery consisting of one engine (80 horse power), boiler (80 horse power), moulds for making brick, brick presses, gas regulators, gas and steam water pumps, clay feeder, clay grinders, pulleys, belting, shafting, brick trucks, barrows, clay gathering machinery, and all other machinery, tools, implements and equipments thereto belonging.

All of said property above described to be sold in bulk, for cash, or, at purchaser's option, one-half cash, one-fourth in six months and one-fourth in nine months, deferred payments to bear 6 per cent. interest, and be secured to the satisfaction of said Receiver.

Also the following personal property belonging to said company, to-wit: One lot of buff pressed brick (about 80,000), one lot of red pressed brick (about 20,000) and one lot of unfinished brick. Said property to be sold for cash. Said Receiver reserves the right to reject any and all bids.

LAWRENCE SIMPSON, Receiver.
Greentown, Ind.

21 d

WANTED—Prices on 225 green-brick cars, 4,000 feet of light T rail, 2 transfer cars for brickyard purposes.
R. MOULTHROP & SON,
13 c Eufala, Ala.

WANTED—Position as setter and burner; understands brick machinery; burn clamp kilns; experienced in brick-making all my life; age, 34 years. Address
12 cm JOHN, Care Clay-Worker.

WANTED—Re-engagement as superintendent of fire brick works; thoroughly experienced in fire brick manufacture, also architectural and paving brick, particularly the former. First-class references. "FIRE BRICK."
104 d Care Clay-Worker.

WANTED—A competent clay molder, one who can make molds from drawings, has had experience in making terra cotta finials and roof ornaments, and can take charge of molding department. Address, with references, H. B. S.,
1 tf L Care Clay-Worker.

FOR SALE—\$1,500 will buy the brick plant at West Brattleboro, Vt. Chief machine, good clay; brick sell for \$6 at yard; house, barn, 4 acres land. Write for particulars to E. S. MORSE, Brattleboro, Vt., or D. H. BOYD,
113 cm Brooklyn, N. Y.

FOR SALE, CHEAP—Brick and tile factory, in Indianola, Warren county, Iowa, or brick machinery, boiler and engine will be sold separately. Present owners cannot handle it. Correspondence solicited.
21 d BERGER, Care of Clay-Worker.

WANTED—One good second-hand 2-mold stiff mud brick repress for standard size brick.
One second-hand pug mill, 14 feet long, for pugging fire clay for stiff mud brick.
65 double-deck brick dry cars, with flat floors.
1 hand-power side-cutting table for stiff mud brick. Address "E."
11 L Care Clay-Worker.

FOR SALE—Two Simpson presses, one Plymouth brick and tile machine, Plymouth board delivery, brick cutting table, Plymouth tile cutting table, Freese "A Special" brick machine, Stevenson pug mill and Emens granulator. For description of this machinery see page 579, June Clay-Worker, or address
CLEVELAND VITRIFIED PRESSED BRICK CO., 809 Cuyahoga Building,
7 tf d Cleveland, O.

FOR SALE—4 second-hand boilers, 40 to 60-horse-power; 1 Chambers machine, 2 pug mills, 12 represses, 18 dump carts, 26 brick trucks, 28 brick wheelbarrows, 20 brick molds. Above goods are all second-hand, and will be sold cheap for cash. Inquire
CHICAGO HYDRAULIC-PRESS BRICK CO., Room 301 Chamber of Commerce Building,
15 c Chicago.

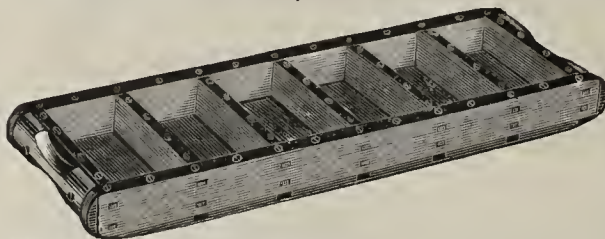
FOR SALE—3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, 1/2 screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
All new or little used, and in excellent condition.
12 d WALNUT, Care Clay-Worker.

FOR SALE—One Soft Mud Brick Yard, complete, except boiler and engine, grand Automatic Brick Machine and Pug Mill, Mold Sanding Machine, Raymond Repress, two Raymond Dump Cars, anti-friction Hoister, 600 feet of rope, Brick Molds, Barrows, Trucks, Doors, Grates, Water Tank and Frame, Water Pipe and Fittings, Racks and Pallets for several hundred thousand brick; everything new; used part of one season; cost \$7,000; sell very cheap, if sold soon. Also, on another yard, one Penfield Horizontal, extra heavy, all iron and steel, Brick Machine and Pug Mill, never used; cost \$1,625. Will take \$600. Five No. 3 Adrian's Brick Machines, stiff clay, good as new, \$250 each; one nine-foot Dry Pan, in first-class condition, solid chaser wheel, with twelve-inch face, are good as new, \$350; one 80 horse power Boiler and Engin, \$400; three Board-delivery Cutting Tables, \$25 each; big lot of Doors and Grates, all good, 1 1/2 c a pound; several thousand feet of T Rail at \$13 a ton.
F. G. LOTTERER,
21 d Fort Scott, Kan.

HARDIN, BAILEY & CHURCH.

MANUFACTURERS OF

BRICK MOULDS



Don't fail to get our prices.

Of every kind and description. We make a specialty of Brick moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.

FREEPORT, IND.



Mey Detachable Chain Belt.

F. H. C. MEY, Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.



Ewart Detachable Chain.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

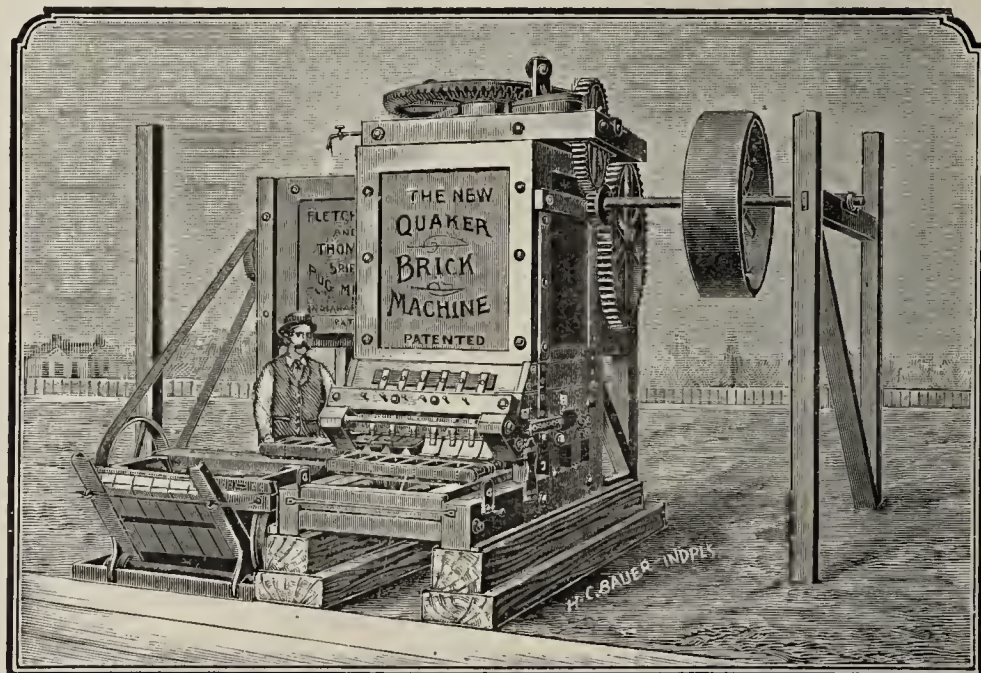
Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

Soft Mud Brick Machinery.

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sanding Machine, capacity 40,000 or more per day. We carry in stock a full line of first-class brickyard supplies at a very reasonable price. Send for Catalogue.



J. W. HENSLEY,

General Agent,

Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

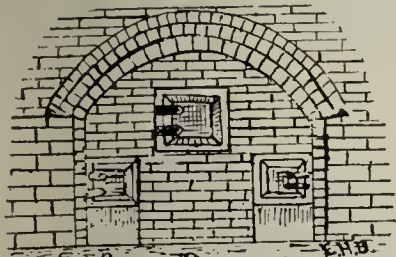
FIRE

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
 44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

Swift's Kiln Furnace,

CAN BE ATTACHED to any kind or style of Up or Down-Draft kiln. Nothing but slack or waste coal used from start to finish of burn. Fires not disturbed but once in 10 hours till watersmoke is off. Guaranteed to watersmoke dry press brick or the tenderest of clays or ware of any kind without damage. These furnaces can be seen in operation at my works at all seasons burning drain tile in winter and brick in Summer. It will pay you to investigate—I can save you good money.



F. E. Swift's Patent
Slack Coal Coker, Gas
Generator and Smoke Consumer.
 Washington, Iowa.

F. E. SWIFT, Washington, Iowa.

DEAR SIR—In reply to yours of the 25th inst. I will say that I have burned our Eudaly kiln with your furnace attached four times, and have each time saved fifteen tons of coal over the other kilns of the same size containing one hundred thousand brick. In the others I used the best of lump coal and after raising the heat up to the highest point have to use wood in connection with the coal, so as to prevent clinking. With your furnace I use slack entirely, and have no trouble and less work and less smoke. The greatest advantage of all is where I used to have several courses of checked brick in the other kilns, I now have my very best brick. I consider it the very best furnace in existence.

CARL NEIS,
 Supt. of Granite Paving Brick Works,
 Burlington, Ia.

F. E. SWIFT, Washington, Iowa.

DEAR SIR:—Yours of recent date at hand, on inquiry how I like your patent brick kiln furnace, will say, I have burned it 15 heats, and am well pleased with it, and find that I can burn my tile with eight tons of slack coal, as hard as I used to with 10 tons of lump coal in the old common fire boxes, which was, as you know, a plain hole in the wall, with short slanting grate bars. The tile does not crack as in the old kilns. There I had three courses cracked almost every one of them more or less, while in yours, I do not have any except by the door, if I do not get it tight enough. I must change my other kilns before I burn them any more.

I must say your furnaces are a "grand invention" and I need not wish you success, for all you have to do is to get them before the public.

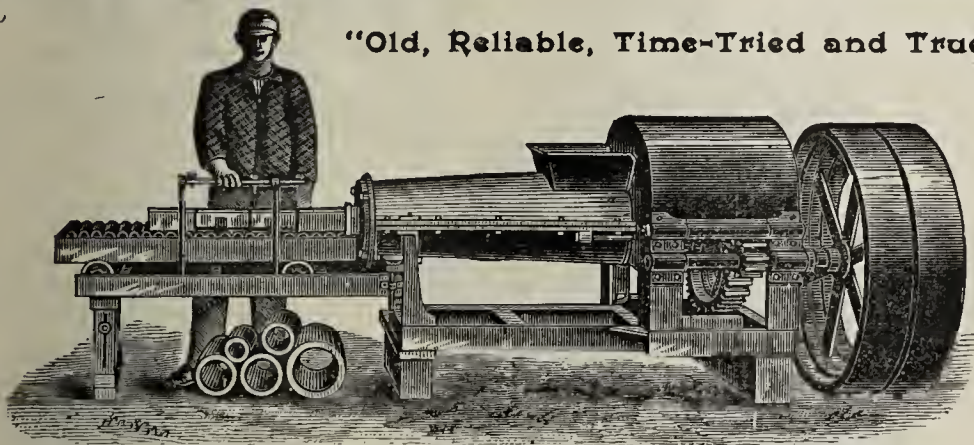
Yours respectfully,
 AUG. H. JOHNSON.

For further particulars, address

F. E. SWIFT, Washington, Iowa.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the backs and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

• We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

• For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,
 PARKHILL, ONTARIO,

• Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the NEW QUAKER BRICK MACHINE.

AHEAD OF CONGRESS.

**Many Roads Have Given Travelers
 What They Demanded.**

**The C., H. & D. Did Not Wait for the
 Interchangeable Mileage Bill to Be
 Passed.**

The general passenger agent of one of the important systems of roads in the Central Traffic Association territory, in conversation with a reporter of the Indianapolis Journal, said: "I see by the Journal of Wednesday that the commercial travelers' bill for interchangeable mileage has been favorably received and will likely be passed at the next meeting of the Senate. The Commercial Travelers' Association have spent a great deal of money and time in pressing this bill. The passage of the bill will undoubtedly help them in some parts of the country, although in the more densely populated and busy parts of the community the demands of business are more likely to produce favorable methods for the free interchange of business than can be accomplished by legislation, as, for example, the recent announcement that, commencing with the 1st of January, the thousand-mile tickets of the Cincinnati, Hamilton & Dayton, which are sold for \$20, are accepted for passage over not only their connections, but competing lines, and this mileage book gives a man the choice of a commercial territory covering over ten thousand miles of railroad. For instance, this ticket is honored from Cincinnati to St. Louis over the issuing road, in connection with the Vandavia, and also over the competing lines, the Big Four and the Ohio & Mississippi. It is also good between Louisville and Cincinnati, good between Chicago and Cincinnati over two roads, good between Cleveland and Cincinnati over two roads, good between Columbus and Cincinnati, good between Cincinnati, Toledo and Detroit, so that, so far as the Central States are concerned, the field is practically covered by the liberal action of the Cincinnati, Hamilton & Dayton Railroad, in advance of the proposed legislation." This is but one of a dozen roads which has greatly extended the use of its mileage books, and the most pleasing feature is that where lines are the sharpest of competitors, the mileage book is honored to such an extent.

PRESSED BRICK PLANT FOR SALE.

This Plant, located at Berlin, Conn., in one of the best brick-making centers in the country, on the main line of the New York, New Haven and Hartford Railroad, one hundred miles from New York, and very convenient to all New England points, will be sold very cheap to settle the estate of the late Edward P. Yale, who was President and principal owner of the Company. It is a splendidly equipped Plant. Buildings and Machinery almost new. The equipment consists of two four-mold Boyd Presses, Engine, Boilers, etc., two patent up and down draught Kilns, capacity of each, 200 M. Splendid Buildings and Sheds, including a fine brick office, and within a stones throw of the Railroad Station.

It may be unnecessary to speak of the Clay, as Berlin brick have a reputation second to none, and there is an unexhaustible supply on the property as well as a splendid Shale Quarry.

This is an exceptional chance for the right man. For further particulars address

F. H. ALLIS,
 New Britain, Conn.

A RARE OPPORTUNITY

To buy a modern brick plant, newly fitted up. Cost, \$27,000. Good reason given for selling. Address GEO. W. SPARKS, 209 North Williams Street, Moberly, Mo.
12 3 cm

FAST TIME AND THROUGH SERVICE TO SOUTH BEND.

Commencing June 22, through parlor cars will be operated between Indianapolis and South Bend daily, except Sunday, on Big Four train No. 3, leaving Indianapolis at 5 p. m., making immediate connection with Vandalia line fast train at Colfax, which passes through Frankfort, Logansport, Lake Maxinkuckee and Plymouth, arriving at South Bend at 10:45 p. m. G. E. ROCKWELL, D. P. A., for details.

Architectural

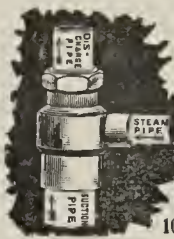
...DRAWING
Mechanical Drawing;
Architecture; Mining;
Civil Engineering in
all Branches; Steam
Engineering (Stat'y.,
Loco. and Marine);
Mechanics; Plumbing;
Electricity.

The International
Correspondence Schools



To Carpenters,

Machinists, Electrical
Workers, Plumbers,
Steam Fitters, Pattern
Makers, Steam Engi-
neers, Draughtsmen,
Miners, Civil Engi-
neers, etc. References
Everywhere. Free Cir-
cular. State Subject
you wish to Study.
Box 958, Scranton, Pa.

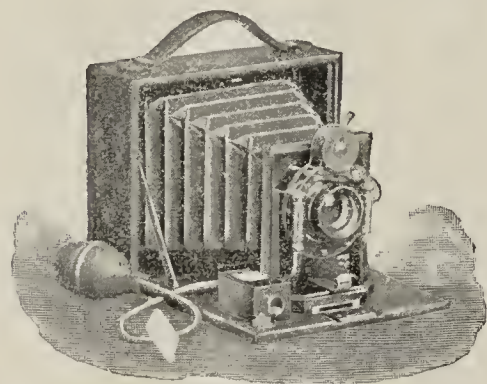


VANDUZEN STEAM PUMP
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
Always in Order, never Clogs nor
freezes. Every Pump Guaranteed.
10 SIZES.
200 to 12000 Gallons per Hour.
Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, O.

GEO. S. COX'S
Ready Made
Cutting Wires,
Always give Satisfaction.
EAST LIVERPOOL, OHIO.
Send for Samples and Prices.

Do You Enjoy Pictures?

And do you know you can make
excellent Photographs yourself
with a

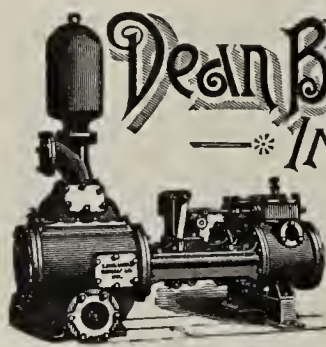


Premo Camera

Light and compact, easily carried
and manipulated. The Premo is
the most popular Hand Camera in
the market.

ROCHESTER OPTICAL CO.,
ROCHESTER, N. Y.

Dean Bros. Steam Pump Works,
—* INDIANAPOLIS, IND. *



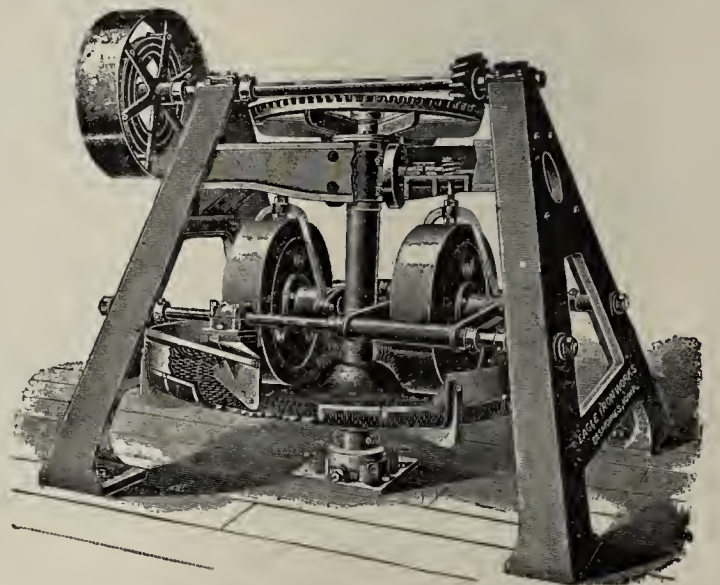
SINGLE & DUPLEX PUMPS.
HORIZONTAL AND VERTICAL PUMPS.
Best Design & Workmanship.
PRICES REDUCED Send for CATALOGUE.

OUR NEW 9 Ft. IRON FRAME DRY PAN

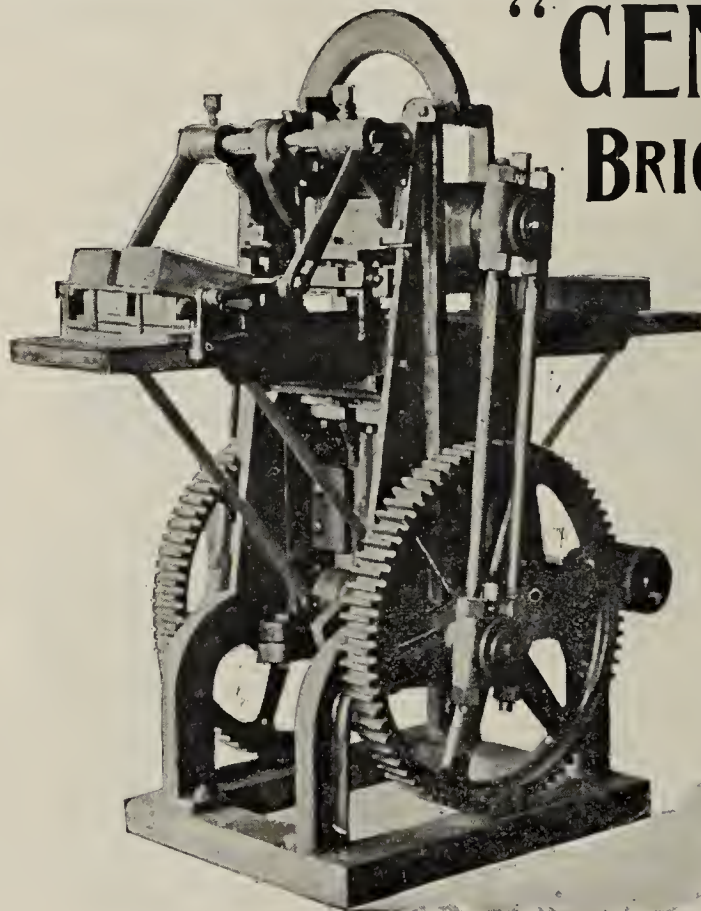
SEND for cata-
logue and read
up on our patented
features of this ma-
chine. Our motto
in its construction
and design is

"NOT HOW CHEAP.
BUT HOW GOOD."

EAGLE IRON WORKS, Des Moines, Ia.



"CENTRAL" BRICK REPRESS.



This cut shows our
double die machine,
which is acknowledged
to be the simplest and best
repress on the market.

It is no experiment, hav-
ing been in use over two
years with best results.
Will do same work as
others of twice the size
and cost.

For particulars address

**Central
Machine
Works,**

**236 Abbey Street,
Cleveland, Ohio.**

We furnish all supplies and repairs for any make of the "SWORD" Brick machine.

G. COLDEWE & CO.,

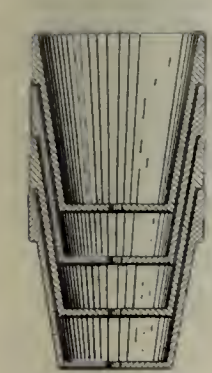
MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE MOULDS

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

INDIANAPOLIS, IND.



CHAMPION Brick Mould

SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and Serviceable.

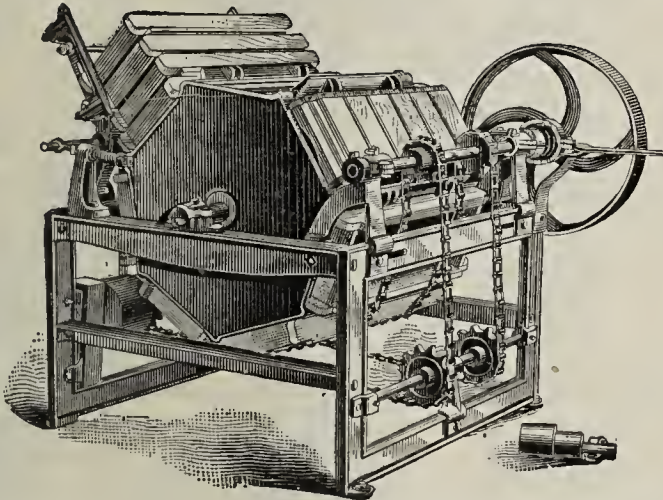
A. H. NEWTON,

Manager and Sole Agent,
HAVERSTRAW, N. Y.

THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, unless the Court grants a re-hearing of the case, or permission to go to the Supreme Court of the United States, a motion for which is pending and will be heard January 25th, 1897.

Only one patent No. 301,087 is involved in this decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit will be commenced at once on these patents against Buck and any persons purchasing from him or his agents.



4000 TO 5500

(Gallons of Water per hour.)

BY HAND-POWER.

Pumps, Hand-power Pumps.

(LOUD'S PATENT.)

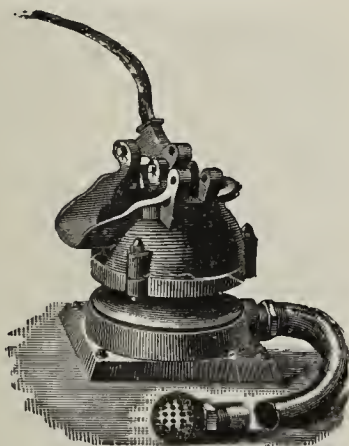
These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries or wherever it is desired to raise a large quantity of water by Hand-power. The pump has large valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



A. F. TENNILLE'S

Bureau of

News and Legislative Information,

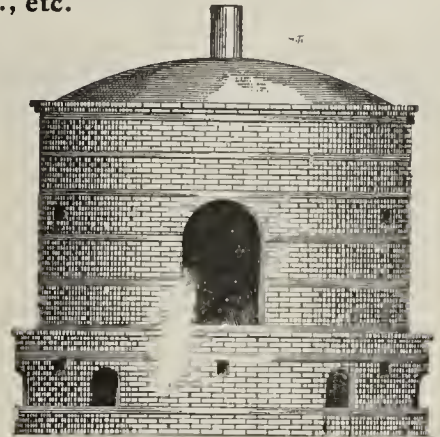
Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,

35, 37 and 39 B St. N. W., WASHINGTON, D. C.

AN IMPROVED MUFFLED KILN

For Burning Terra Cotta, Fine Front Brick, Enameled Brick, Encaustic Tile, etc., etc.



WE have had many years' experience in building terra cotta, brick and tile kilns of different kinds, and can guarantee successful and satisfactory results, being practical kiln builders. Our terms are reasonable. Write for particulars, stating character and capacity of kilns desired.

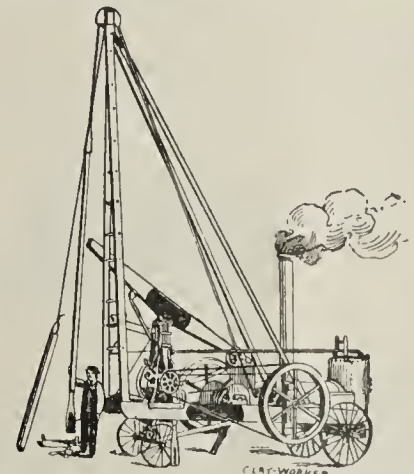
F. HUNDT & CO.,

801 Dudley St., Chicago, Ill.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,

PERTH AMBOY, N. J.

THE IMPROVED Interlocking Brick.

For Hollow Walls and Ventilating.

Send for pamphlet.

G. S. BALSLEY, 490 Howard Street, Detroit, Mich

ALBANY SLIP CLAY.

We have a large bank of a superior quality of SLIP CLAY. Price very low by barrel or carload. Best of reference as to quality.

Address

JOHN H. JACKSON,
Successor to JACKSON BROS.,
ALBANY, N. Y.

N. Y. State Drain Tile and Pipe Works.

Established 1852.

GEORGE C. HICKS,

Consulting Engineer

In matters relating to the manufacture of Gas Retorts, Fire Brick, Terra Cotta Building Brick, Faience and other clay products.

Plans furnished for kilns and complete manufacturing plants, also system of bookkeeping to ascertain daily cost of manufacture.

Address by letter only

care FISKE, HOMES & CO.,
Boston, Mass.

Steubenville Foundry & Machine Works,

Established in 1820.

—Manufacturers of—

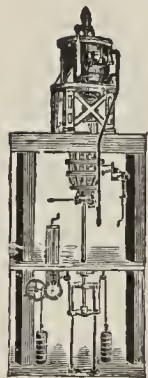
STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,

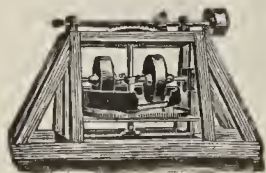
Making From 2 to 30-Inch
Pipe Inclusive.

Pipe, Brick, Tile, Coping,
Fire Proofing, and
Building Block Dies.

Clay Grinding and Tempering
Pans and Pug Mills.



FEED
SCREWS
FOR
MINING
CLAY.



STEAM
— ENGINES
— AND —

Every Variety of Iron and Brass Castings
Shafting and Pulleys.

Send for Circulars and Estimates.

JAS. MEANS & CO.,
Steubenville, Ohio.

NEW DISCOVERY KILN

Patented April 13, 1886, June
1888 Nov. 7 1891.

More Than 1,000 Now Stand as

Monuments of Fame to its Inventor

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what they say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
Marietta, Pa.

Chenoo, Ill.



Elevators

For handling

CLAY,

COAL,

SAND,

BRICK,

TILE,

PACKAGES.

Also Furnish

RUBBER,

LEATHER,

COTTON

BELTING.

JEFFREY

Roller, Steel and Special CHAINS
—FOR—
**ELEVATING
CONVEYING
MACHINERY**
FOR HANDLING MATERIAL OF ALL KINDS.
Power Transmission Machinery.
COAL MINING MACHINERY.
WIRE CABLE
CONVEYORS.
For long and
short distance
conveying.

THE JEFFREY MFG. CO., Columbus, Ohio.
Send for Catalogue. 163 Washington St., NEW YORK.

Conveyors.

Manufacture

SHAFTING,

PULLEYS,

HANGERS,

GEARS,

CLUTCHES,

BUCKETS

BOOTS,

BOLTS,

Etc. . . .

THE HOT BLAST APPARATUS

FOR
DRYING
BRICK
TILE AND
TERRA COTTA

AMERICAN BLOWER CO
SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

SEND FOR CATALOGUE

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years. Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

•••••

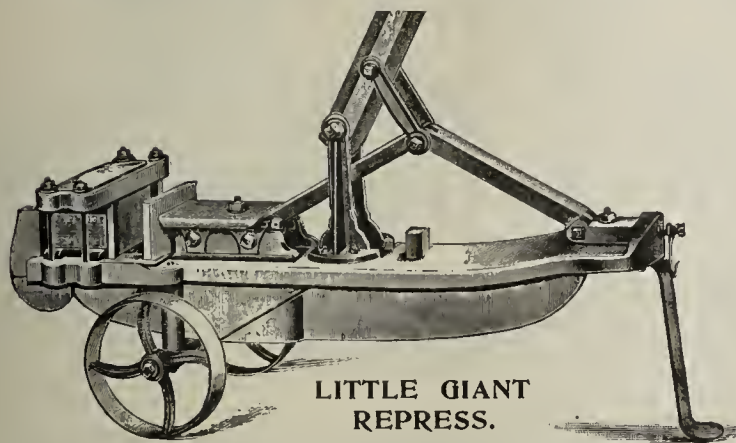
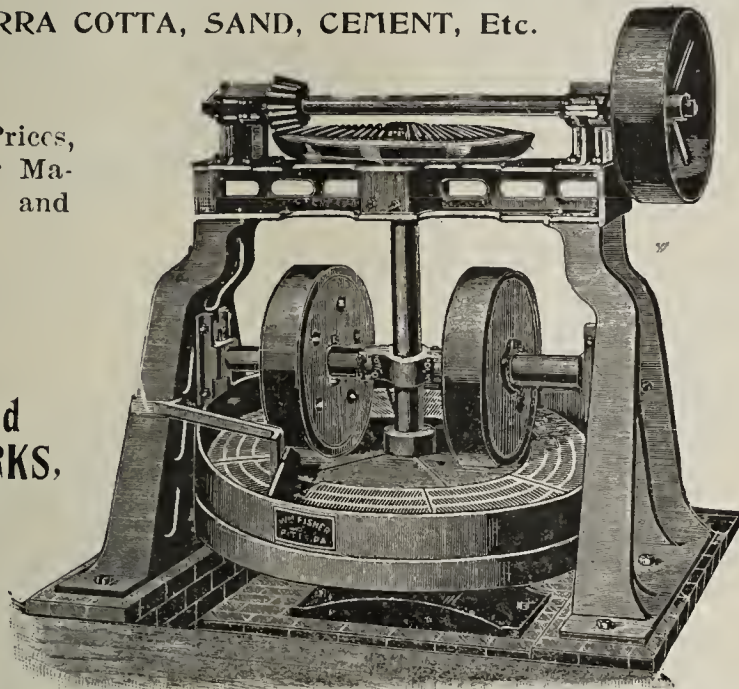
When writing for Prices, state kind of Clay or Material to be ground and capacity required.

•••••

**FISHER ENGINE
FOUNDRY and
MACHINE WORKS,**

Phillips & McLaren,
Proprietors,

24th and Smallman Sts.,
PITTSBURG, PA.



LITTLE GIANT
REPRESS.

ELI Auger Machine,
Capacity 45,000 to
70,000.

ELI Jr. Auger Machine,
Capacity 30,000 to 40,000.

LITTLE ELI Auger
Machine, Capacity
15,000 to 20,000.

No. 1 A, Auger Machine,
Capacity 25,000 to 35,000.

No. 2 B, Auger Machine,
Capacity 12,000 to 20,000.

THE No. 1 A and No. 2 B Machines furnished with Square Hopper in place of Upright Pug Mill if desired.

DISINTEGRATORS, HORIZONTAL CONVEYORS,

GRANULATORS—SINGLE AND DOUBLE SHAFT,

UP-RIGHT PUG-MILLS, WINDING DRUMS,

BRICK TILE AND HOLLOW BLOCK TABLES.

TRUCKS, WHEELBARROWS, ETC.

Manufactured and fully warranted by

Michigan Brick and Tile Machine Co.,
MORENCI, MICH.

M. V. B. WAGONER'S

SLIP CLAY { For Glazing of Pottery } **WORKS**

ESTABLISHED 1845.

Clay in stock in any quantity, in barrels and bulk by the carload.

Office, 20 Ten Broeck St., ALBANY, N. Y.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN,
H. W. FULLER, Ass't Gen'l Pass. Agent.
Gen'l Pass. Agent, CINCINNATI, OHIO
WASHINGTON, D. C.

STOP-LOOK LISTEN

THE
POPULAR

MONON ROUTE

(LOUISVILLE NEW ALBANY CHICAGO R.T.C.)

IS THE BEST LINE TO

CHICAGO

TIME REDUCED TO 4 3/4 HOURS.

FOUR DAILY TRAINS

Leave Indianapolis	7:00 a. m., 11:50 a. m.
	3:35 p. m., 12:55 night
Arrive Chicago	12:00 noon, 6:00 p. m.
	8:20 p. m., 7:20 a. m.
Trains	3:30 a. m., 7:45 a. m.
Arrive Indianapolis	2:35 p. m., 4:37 p. m.

LATEST IMPROVED

VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant

PARLOR CARS AND DINERS

Local Sleeper in Indianapolis Ready at 8:30 p. m.
Leave Chicago, Returning, at 2:45 a. m.
Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: 2 West Washington St.,
Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.

TAKE THE
BIG 4
TO
ST. LOUIS



Solid Train Between
Sandusky and Peoria
—AND—
INDIANAPOLIS and
MICHIGAN CITY,
FT. WAYNE and
CONNEERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger..... 7:00 a. m.
*No. 22 Passenger..... 1:20 p. m.
No. 24 Passenger..... 7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger..... 10:20 a. m.
No. 23 Passenger..... 2:50 p. m.
No. 25 Passenger..... 6:20 p. m.
*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on
A. H. SELLARS, Agent,
Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD and JACKSONVILLE, ILLINOIS.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express..... 8.30 a m
Accommodation..... 3.25 p m
Fast Express..... 11.20 p m

ARRIVE.

Fast Express..... 3.30 a m
Accommodation..... 10.40 a m
Mail and Express..... 4.50 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



Anyone sending a sketch and description may quickly ascertain, free, whether an invention is probably patentable. Communications strictly confidential. Oldest agency for securing patents in America. We have a Washington office. Patents taken through Munn & Co. receive special notice in the

SCIENTIFIC AMERICAN,

beautifully illustrated, largest circulation of any scientific journal, weekly, terms \$3.00 a year; \$1.50 six months. Specimen copies and HAND BOOK ON PATENTS sent free Address

MUNN & CO.,
361 Broadway, New York.

LUMBER AND BRICK DRYERS, MOST EXTENSIVE IN USE. W. A. LEARY,

1103 H Street, N. W.

WASHINGTON, D. C.

Do You Want

CREDIT REPORTS on men who make BRICK, on men who buy BRICK, on men who sell BRICK? Trustworthy service at lowest prices; ordinarily \$1.00 for each report.

RELIABLE LIST of BRICK manufacturers and Supply men, in any State, in any Country? These can be furnished at small cost, usually \$1.00 for any single list.

ADVANCE REPORTS that are advance reports of all contemplated construction work calling for BRICK?

TO KNOW how to sell BRICK to the Government?

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS,

ESTABLISHED NINE YEARS.

Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

"LEVIATHAN."

"Upon Earth There is not His Like."

MAIN BELTING CO., 248 Randolph St., Chicago, Ill. Sept 1896.

GENTLEMEN:—Please ship us via freight, 146 feet x 18" 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN."

Prompt shipment of the above will oblige.

Yours very truly,

Manufactured under Special Process.

A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum

MAIN BELTING COMPANY,

Sole Manufacturers LEVIATHAN BELTING,
248 Randolph St., CHICAGO, ILL.

PHILADELPHIA: 1219 Carpenter Street.

BOSTON: 120 Pearl Street.

THE Best Up-to-Date Brick Dryer.

The PHILLIPS DRYER is THE BEST DRYER because it dries brick Quickly, Safely and Cheaply. By this system there is really no cost for fuel for it saves more fuel than it uses. This may sound queer but it's A PROVEN FACT.

SOMERSET, MASS., August 26, 1896.

S. G. Phillips, Esq., Rahway, N. J.

DEAR SIR—Replying to your inquiry regarding Dryer. We are pleased to say the dryer has now been running five weeks, and so far has given the best of satisfaction, drying our pressed brick for enameling in 10 hours, size of brick (9" x 4 1/2" x 3") without warping or checking.

A vacuum gauge to the exhaust, that heats the dryer, shows our variable cut-off engine to be made condensing, and it is safe and not over-estimated in any point of view to say, the dryer is so far working all right, and costing us no extra power, or firing, as we also do our former work and yet are saving 20 per cent. in our fuel.

We consider the dryer to be doing all if not more than promised, and hope soon to add to our present capacity another two track section.

Yours truly,

SOMERSET & JOHNSONBURG MFG. CO.,

By Warren H. Sandford, Treas.

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,
CHAMBERS BROTHERS Co.,
J. H. Chambers, Gen'l Mgr.

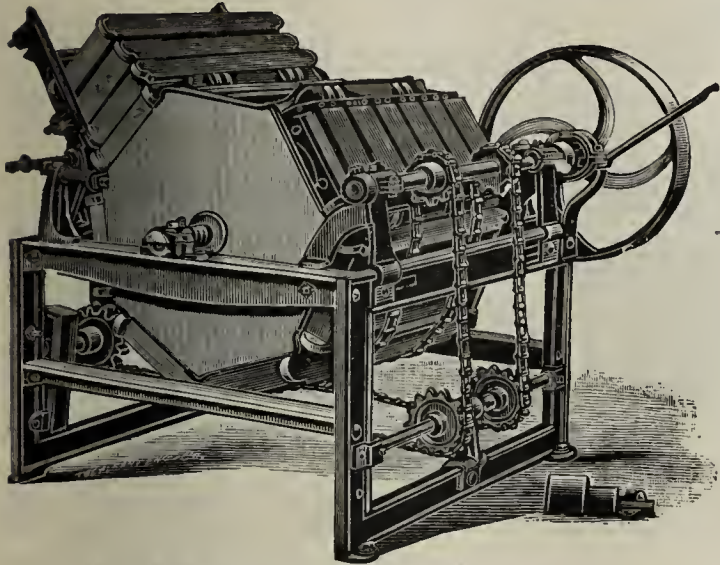
S. G. PHILLIPS.

Agent and Patentee,

161 Grand Street.

— Rahway, N. J.

BUCK'S NEW CHAMPION Brick Mould Sanding Machine.



Judge Wallace's Decision.

[COPY.]

U. S. Circuit Court Southern District of New York.

ADDIE NEWTON } In
vs. } Equity.
WILLIAM W. RIDER }

This cause having come on to be heard this sixth day of April, 1895, upon argument of demurrer, and Mr. Walter E. Ward having been heard on the part of the plaintiff, and Mr. George A. Mosher on the part of the defendant, and due deliberation having been had, it is. Ordered, adjudged and decreed that demurrer be sustained, and that the plaintiff's bill of complaint be dismissed with costs to the defendant to be taxed.

WM. J. WALLACE,
Circuit Judge.

THIS terminates the suit on patent No. 301,087 which Newton has so extensively advertised. It was defended by J. A. Buck without expense to Rider. Any interest which Newton may have had in this patent has since been sold at receiver's sale, April 30, 1895. The other patents relating to this machine had been previously sold January 21, 1892, at a similar sale. J. A. Buck now owns or controls all patents relating to this machine, and the trade is warned that so-called "Champion" machines made by other parties are infringements upon these patents.

J. A. BUCK, 76 Oneida St., Cohoes, N. Y.

WHITEHEAD BROS. & CO., General Agents, 517 West 15th St., New York City.

VANDALIA LINE

The Short Line for

St. LOUIS AND THE WEST.

LEAVE INDIANAPOLIS,	AR. TERRE HAUTE	AR. ST. LOUIS.
* 7:20 am	10:05 am	.....
* 8:15 am	10:19 am	3:55 pm
* 12:40 noon	2:44 pm	7:32 pm
* 7:00 pm	9:04 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am

*Daily.

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Tickets Offices, 48 West Washington St., 46 Jackson Place and Union Station.

GEO. E. ROCKWELL, Dis. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS

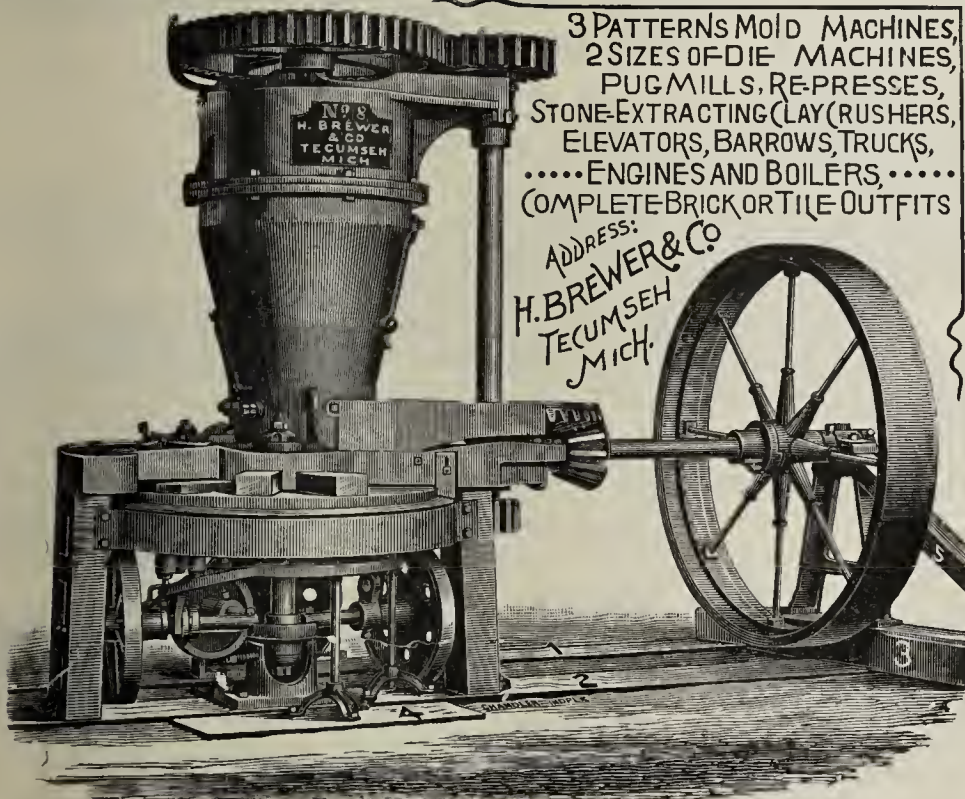
MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns WANTING INDUSTRIES

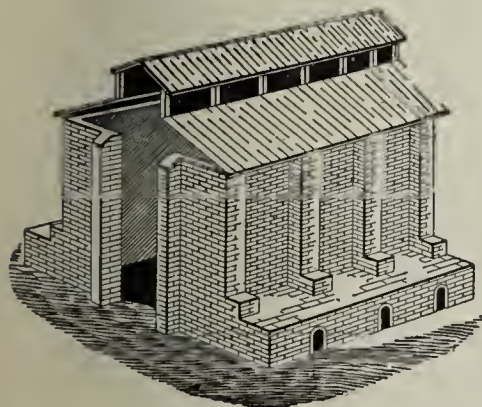
This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.



3 PATTERNS MOLD MACHINES,
2 SIZES OF DIE MACHINES,
PUG MILLS, RE-PRESSES,
STONE-EXTRACTING (LAY) RUSHERS,
ELEVATORS, BARROWS, TRUCKS,
..... ENGINES AND BOILERS,
COMPLETE BRICK OR TILE OUTFITS

ADDRESS:
H. BREWER & CO
TECUMSEH
MICH.



Up-Draft Kiln.

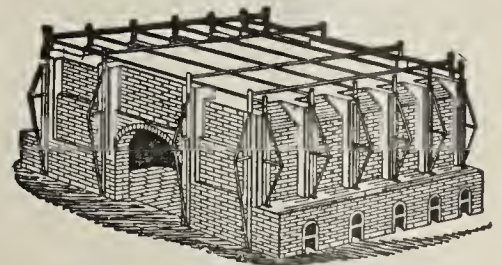
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiin.



BRICK CARS.

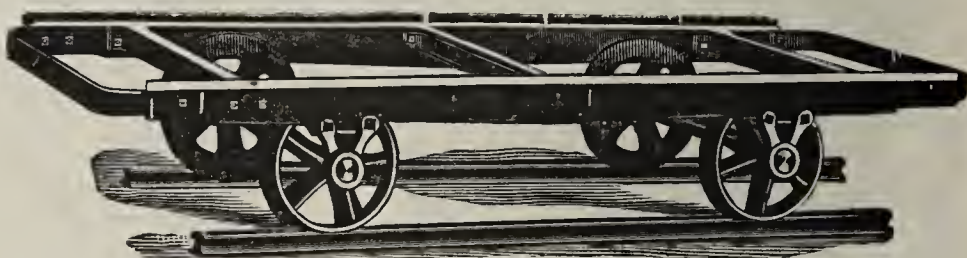
THE BEST. NO EXPERIMENT.

Thirty styles of our cars in use in all parts of the United States and Canada. Nearly 2000 of our cars are in use in Cleveland alone by the following Brickmakers:

F. H. Eggers,
C. G. Barkwell,
Standard Brick Co.,
Peter Cullen,
Collinwood Brick Co.,
Cleveland Brick Co.,
Canadian Copper Co.,
George Gynn,
Warren Farr,
John Cullen.

Write Them,
Then Us.

Catalogue and Price List sent on application.



Style 28.

WALWORTH RUN FOUNDRY CO., Cleveland, O.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

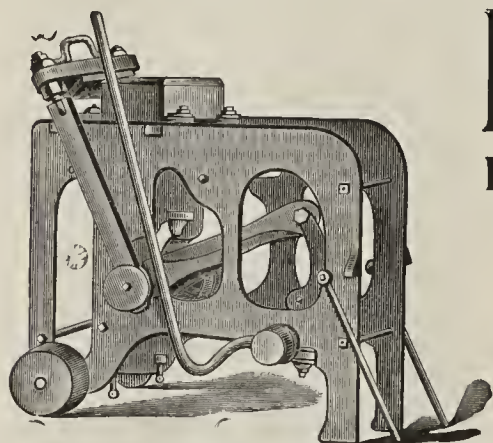
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,

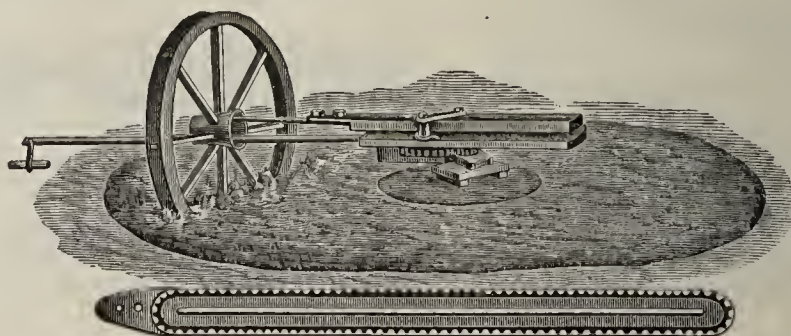
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

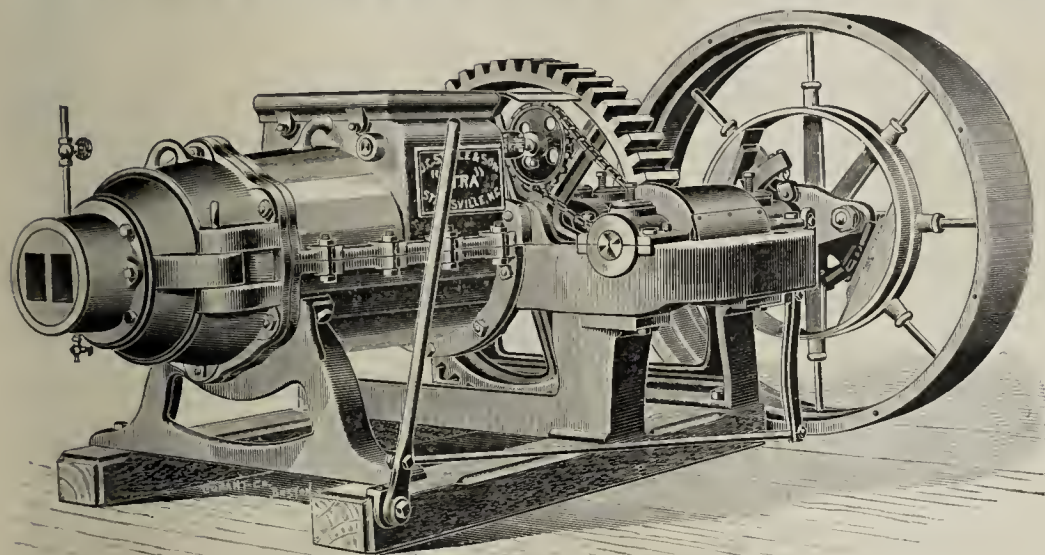
Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The New South Brick Machinery



X-tra Machine. Capacity 25,000.

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.

DANVILLE, VA., Sept. 22, 1896.

J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Answering your query as to how we are pleased with the outfit furnished us by you of brickmaking machinery and implements, we would say that it has given us good satisfaction. The brick machine does all that you claimed for it. The trucks are great labor saving implements and the winding drum and cars equally so. In our system we could hardly dispense with either the trucks or cars and drums.

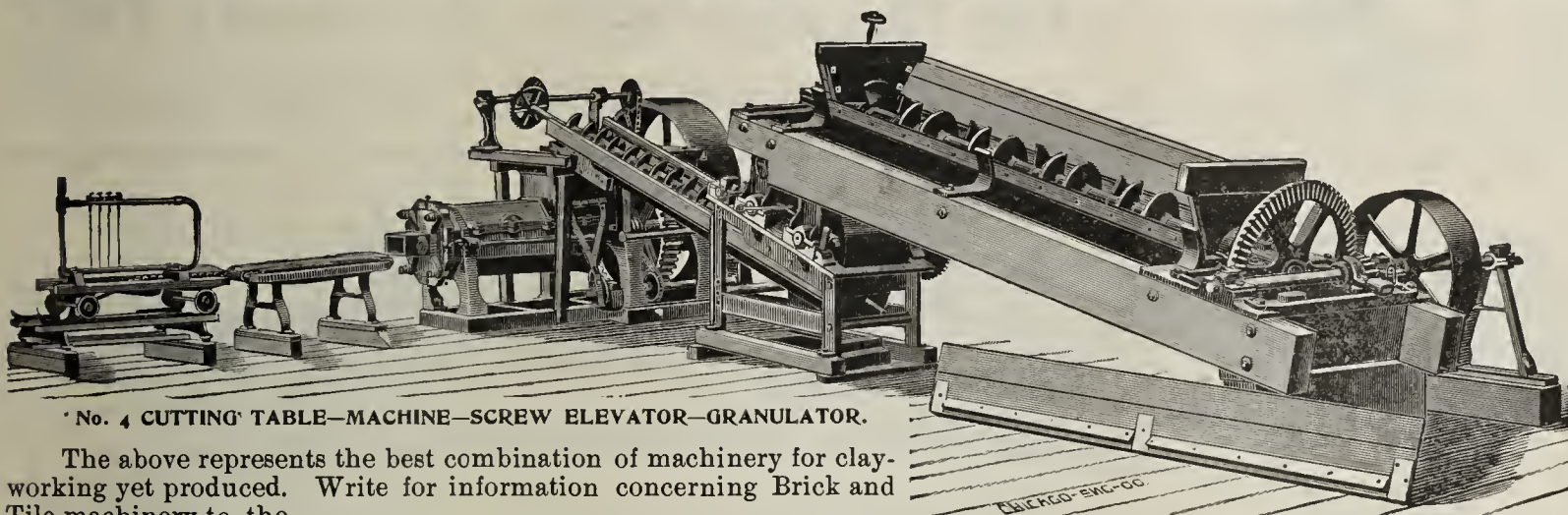
Respectfully,
DON VALLEY BRICK CO.

(This company is using the "X-tra" machine and make 30,000 brick per day.

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

ADRIAN BRICK AND TILE MACHINE CO.



No. 4 CUTTING TABLE—MACHINE—SCREW ELEVATOR—GRANULATOR.

The above represents the best combination of machinery for clay-working yet produced. Write for information concerning Brick and Tile machinery to the

ADRIAN BRICK AND TILE MACHINE CO., Adrian, Michigan.

STEDMAN'S IMPROVED CLAY DISINTEGRATOR

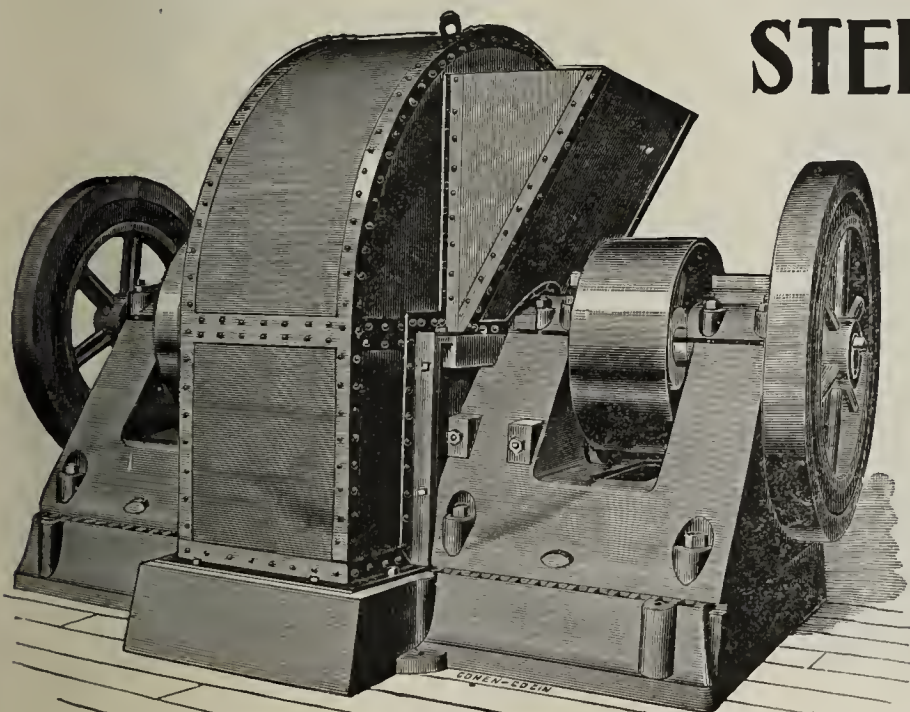
For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

Aurora, Ind.



I Just Can't Remember



What Concern I was referred to for that new Brick Machine.

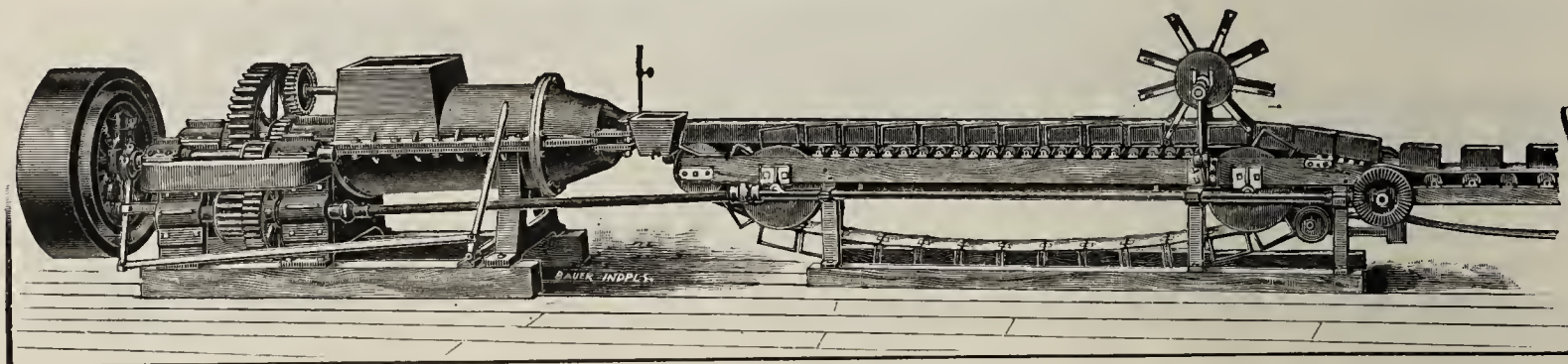
Fellow told me I could save money there and get the best machinery too.

Said they handled everything in the brick line—both **new** and **second-hand**. Was sure they would treat me right, and fix me out with anything I wanted.

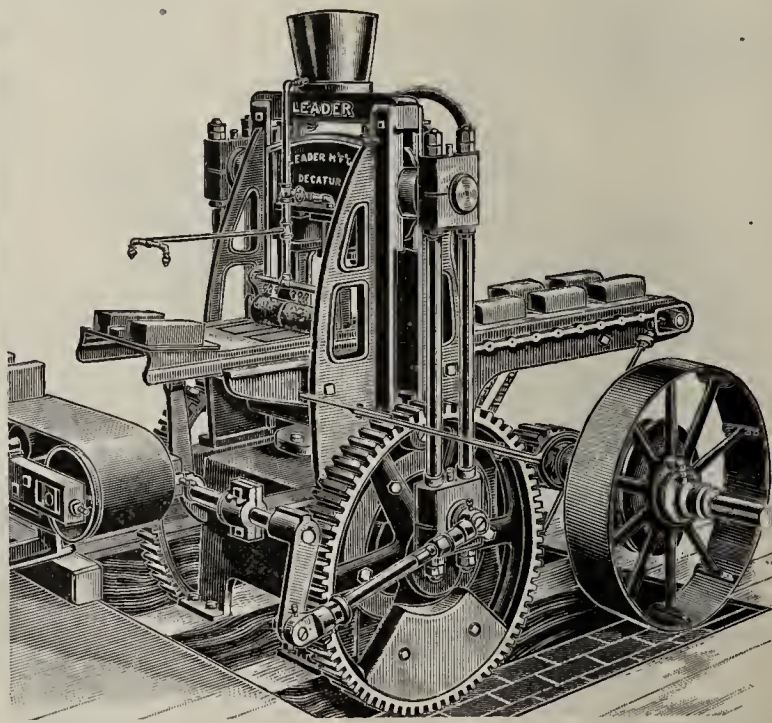
Wish I could remember their name. Where were they at? Oh yes! **Chicago**, of course.

Hurrah! **Now** I've got it. I'll write them to-day **sure**. It is

The Chicago Brick Machinery Co.,
225 DEARBORN STREET.



* **LEADER** *
MANUFACTURING Co
 DECATUR ILL.
 MANUFACTURERS OF
 BRICK MACHINES, BRICK PRESSES,
 PUG-MILLS, CRUSHERS
 DISINTEGRATORS, AUTOMATIC CUTTERS,
 + ELEVATORS +
 AND
 COMPLETE OUTFITS.
 SEND FOR PRINTED MATTER.



B RICKMAKING MACHINERY,
Horizontal Stock Brick Machines,
Vertical Stock Brick Machines,
Disintegrators, Pug Mills, Granula-
tors, Elevators, Trucks and Barrows.
Moulds for machine or hand. Every-
thing used on a brick yard manufac-
tured by us. You save money and
all commissions.

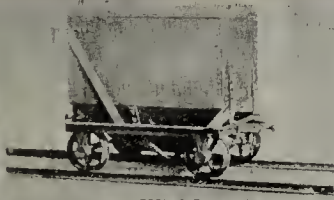
C. & A. POTTS & CO.,

420-428 West Washington St.

INDIANAPOLIS, IND.



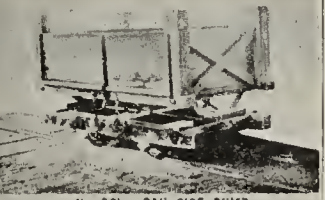
No. 146. TURNTABLE.



No. 150. STEEL BOTTOM DUMP.



No. 170. STEEL SIDE DUMP.



No. 201. OAK SIDE DUMP.



No. 142. TRANSFER CAR.

THE ATLAS BOLT & SCREW CO.,
CLEVELAND, O., U.S.A.
MANUFACTURERS OF

STEEL BRICK DRYER CARS,
SMALL CARS OF ALL KINDS,
STEEL DRY KILN, LUMBER TRUCKS,
STRONG, LIGHT AND EASY RUNNING.
FULL LINE STEEL WHEELBARROWS.



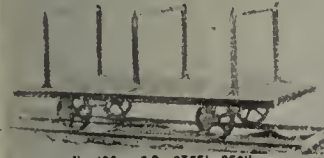
No. 105. SOFT MUD FLAT.



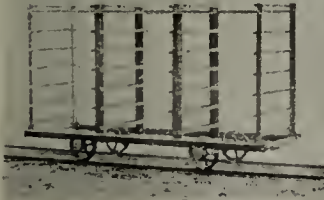
No. 103. STIFF MUD FLAT.



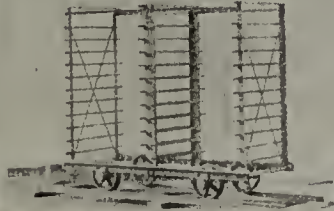
No. 108. FLAT, STEEL DECK.



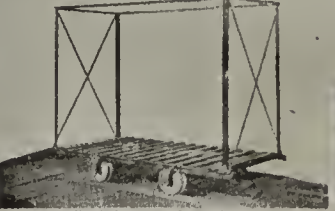
No. 126. D.O. STEEL DECK.



No. 136. 3 SECTION RACK.



No. 133. SOFT MUD RACK.



No. 140. BOX SHUCKS. Etc.



No. 139. SHINGLES, STAVES, Etc.

ARNOLD'S

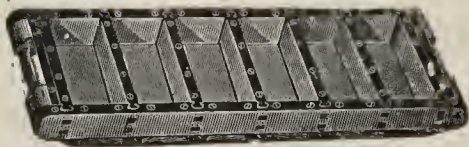
BRICKYARD SUPPLIES,
Are the Standard.



3 Brick Hand Mold.



6 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

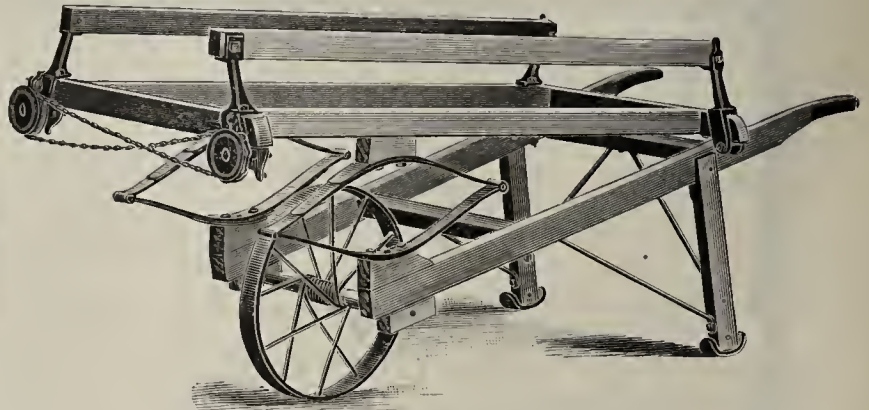
Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

Send for catalogue and price list. Address,

D. J. C. ARNOLD, New London, Ohio.

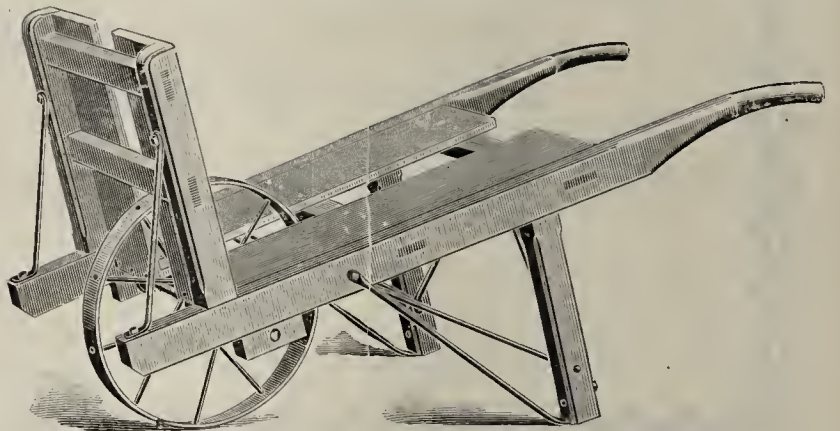
TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market.

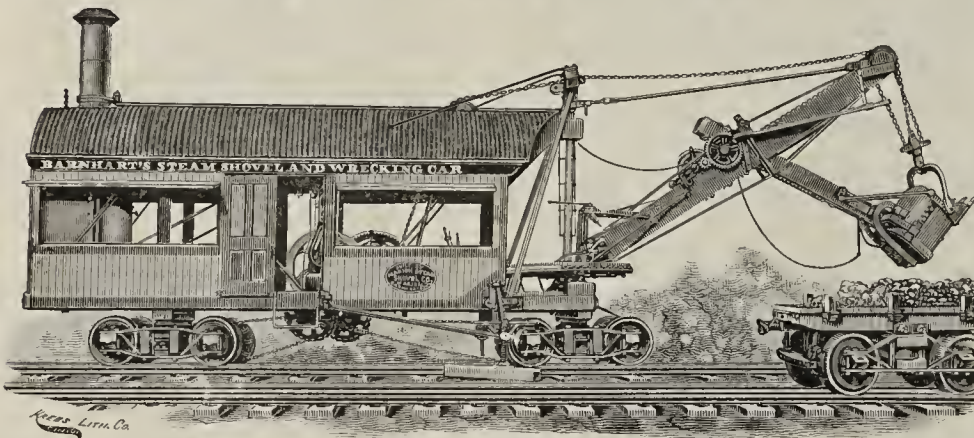
BARROWS, For Various Purposes.

Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind.



No. 4 Brick Barrow.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

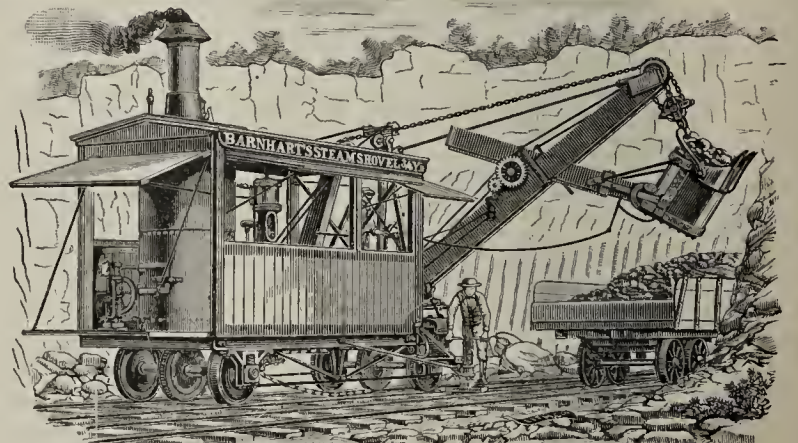
We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

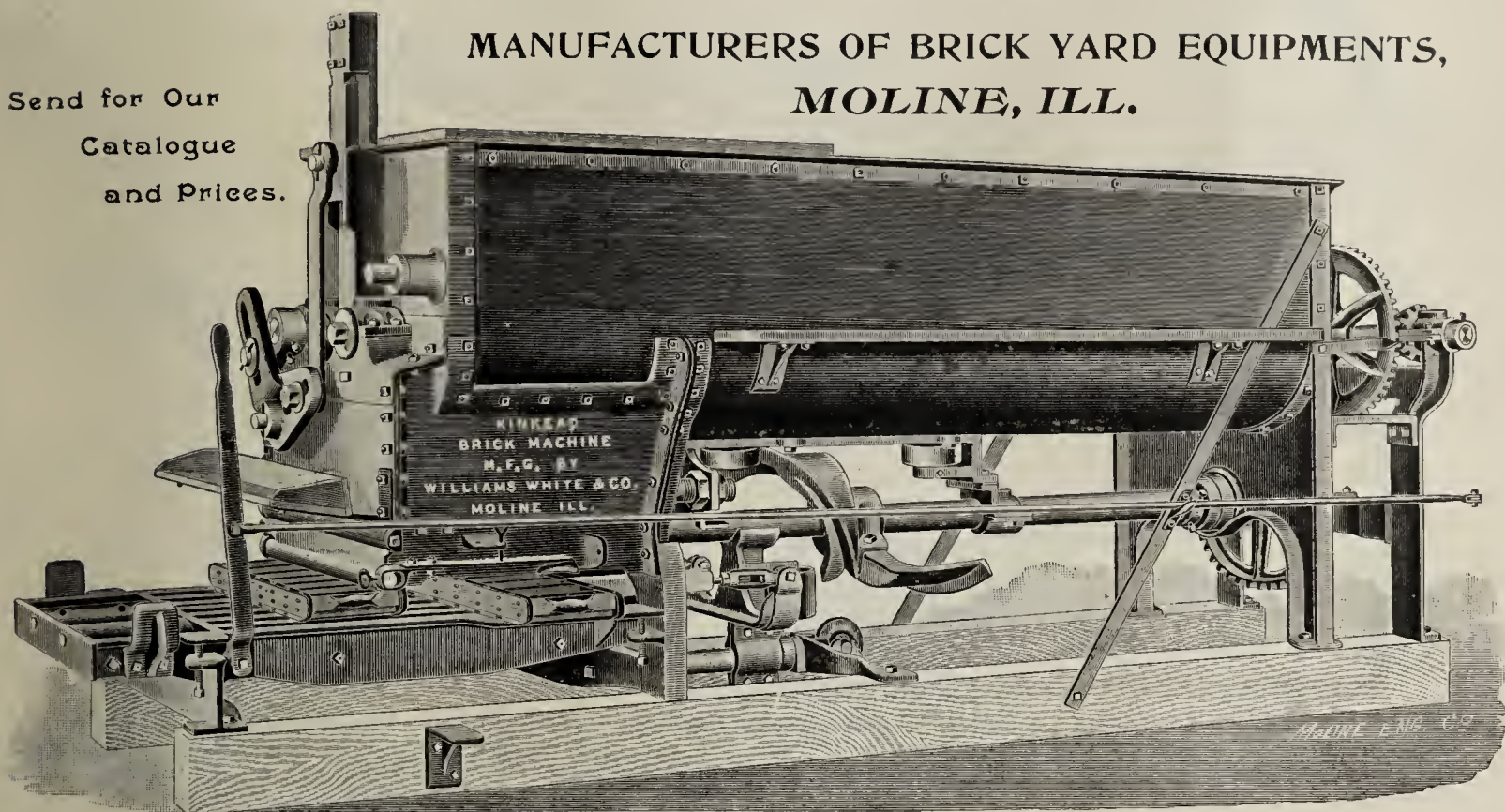


STYLE C—¾ YD.

WILLIAMS, WHITE & CO.

MANUFACTURERS OF BRICK YARD EQUIPMENTS,
MOLINE, ILL.

Send for Our
Catalogue
and Prices.



We make improved Brick Molds, Trucks, Barrows and Cars of all kinds. Everything we make is sold under a positive guarantee. We make the BEST as well as the CHEAPEST Clay Disintegrators, Mold Sanders, Elevators and Brick Yard Supplies of Every Description. **Special Prices on Molds Ordered Before February 15th.**

ROPKEY MASON ENGRAVING CO.

INDIANAPOLIS.

THE BEST HALF-TONES, ETCHINGS AND WOOD CUTS, AS WELL AS THE MOST ARTISTIC DESIGNS EVER USED BY THE CLAY-WORKER WERE MADE BY THE ROPKEY MASON ENG. CO.

Sincerely
T. J. Randall & Co.



THIS KILN is cheap to construct, simple in operation and permanent in character. It has no crown to fall in and costs nothing for repairs. The dampers in the bottom give complete control of the heat and draft. It burns all brick evenly and thoroughly. It heats the brick gradually and cools the same, producing a tough and thoroughly annealed brick. It requires less than 200 lbs. slack coal per thousand to burn the very best annealed vitrified shale paving brick. It saves labor—one man can fire the largest kiln.

The Slack is converted into Gas and all the Heat Energy in the Coal is Utilized.

IT IS A SMOKE CONSUMER AND A PROFIT PRODUCER. ✦ **YOU NEED THIS KILN.** ✦ WRITE OUR GENERAL MANAGER FOR FULL INFORMATION.

ALSIP'S LATE IMPROVED DOWN and UP-DRAFT KILN.

IS SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

Address, **S. H. ALSIP,**

Days Brick Yard.

BELLEVILLE, ILL.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

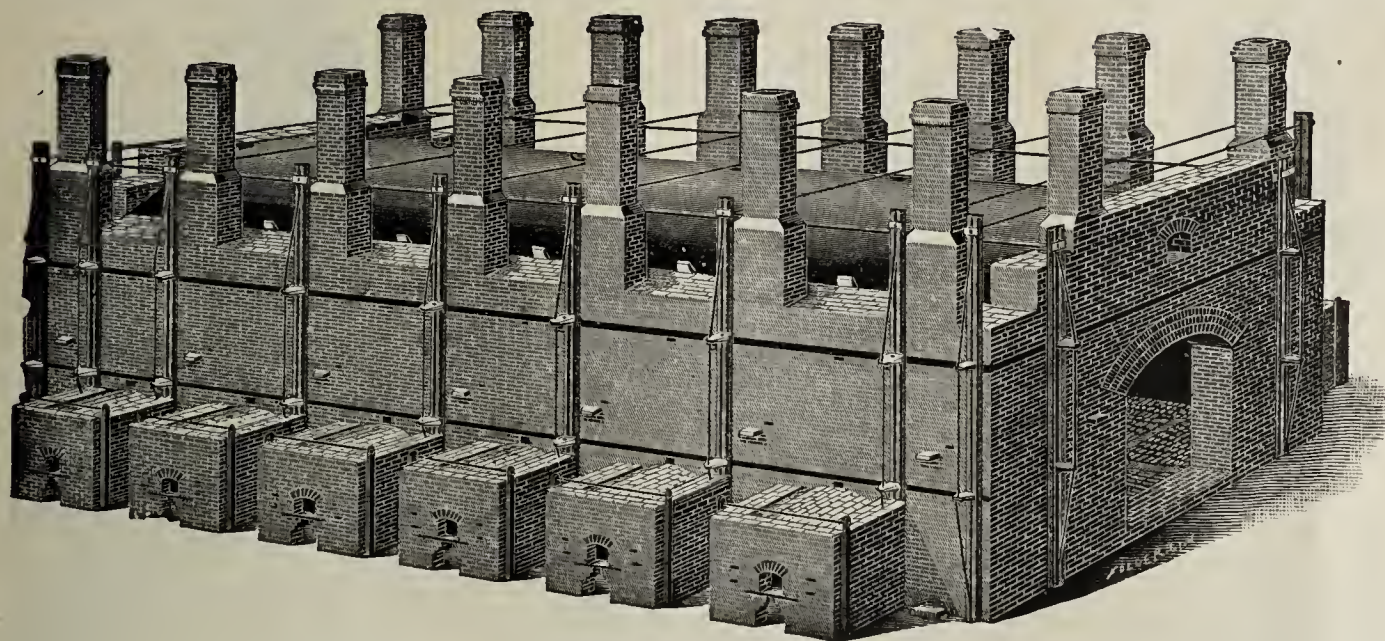
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



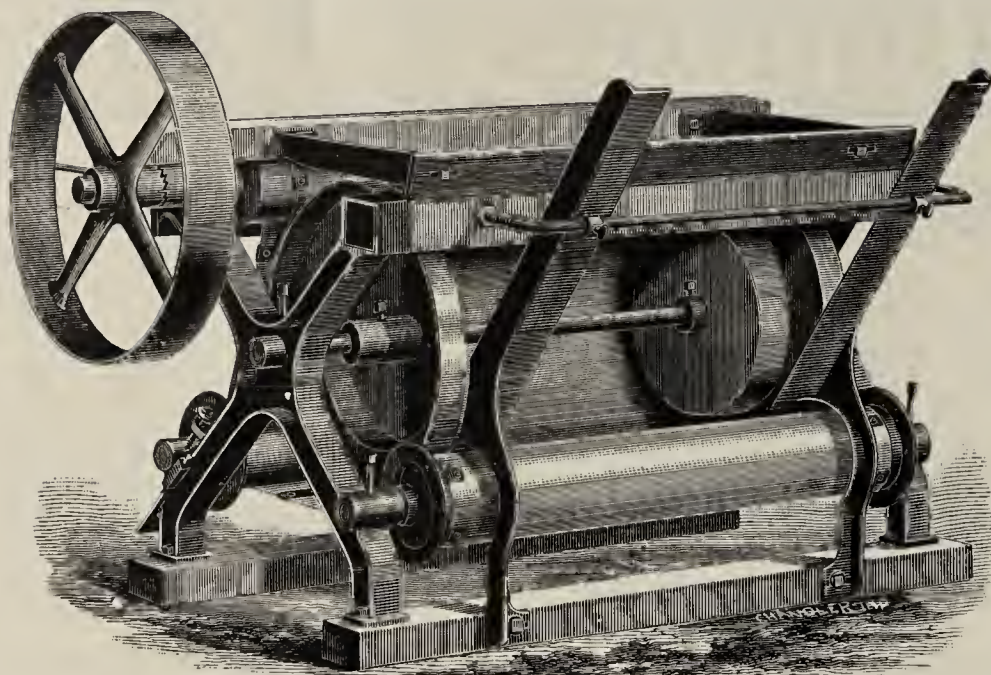
A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

NOW IS YOUR CHANCE TO PURCHASE A Potts Mould Sander.



PATENTED FEBRUARY 5, 1889.

This Spring we will sell them for considerably less than

\$100.

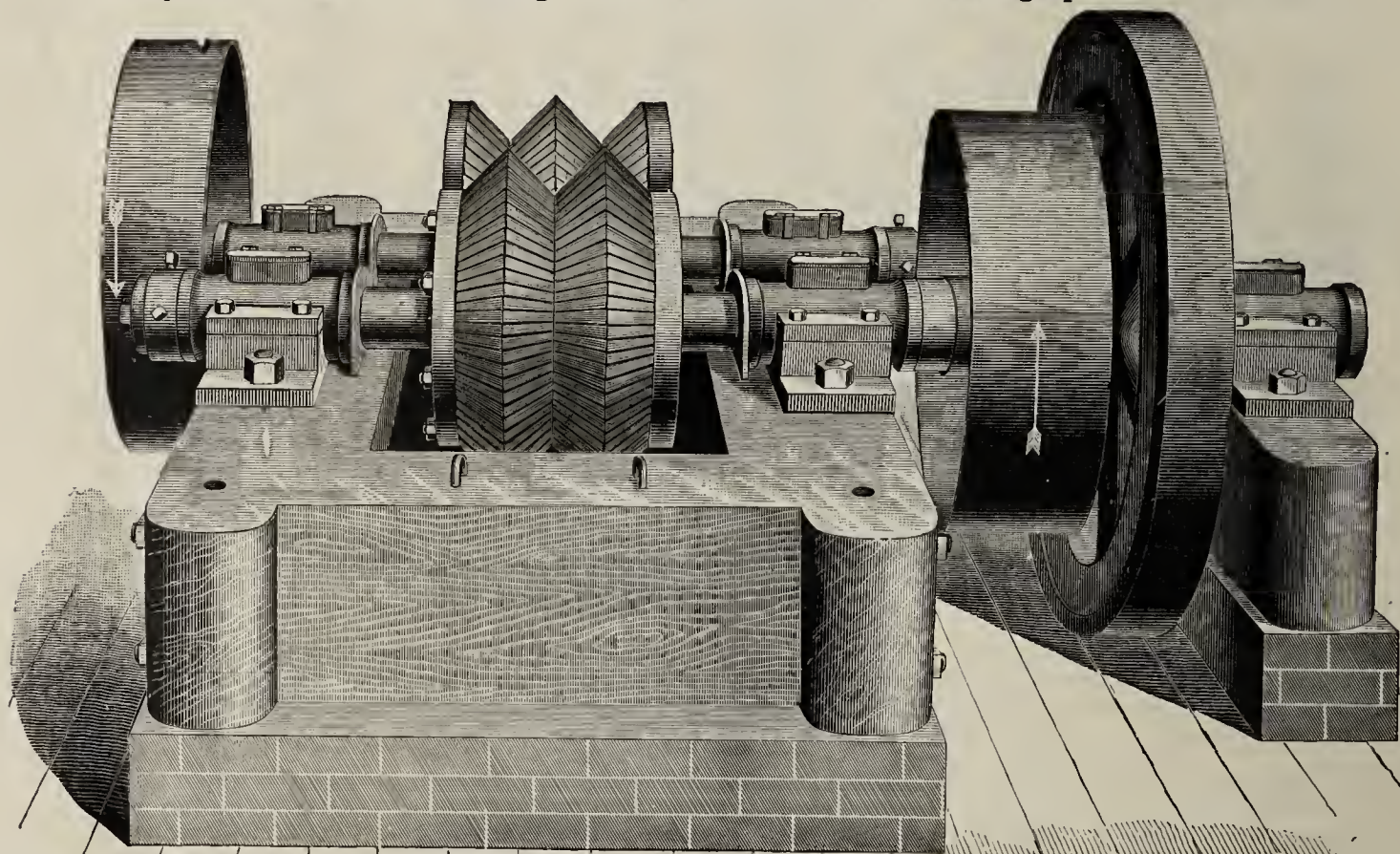
No place for the moulds to catch and cause delays. No light complicated parts to wear or break. Sands the moulds better than can be done by hand or any machine made. Shipped subject to trial.

— WRITE US. —

C. & A. POTTS & CO., 420 W. Washington St. **INDIANAPOLIS, IND.**

NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building, New York, U. S. A.
26 Cortland and 21 Dey Streets,

A SURE THING.

...

OUR SPECIALTY IS MACHINES FOR

Sand Moulded Brick.

THE OLD AND RELIABLE

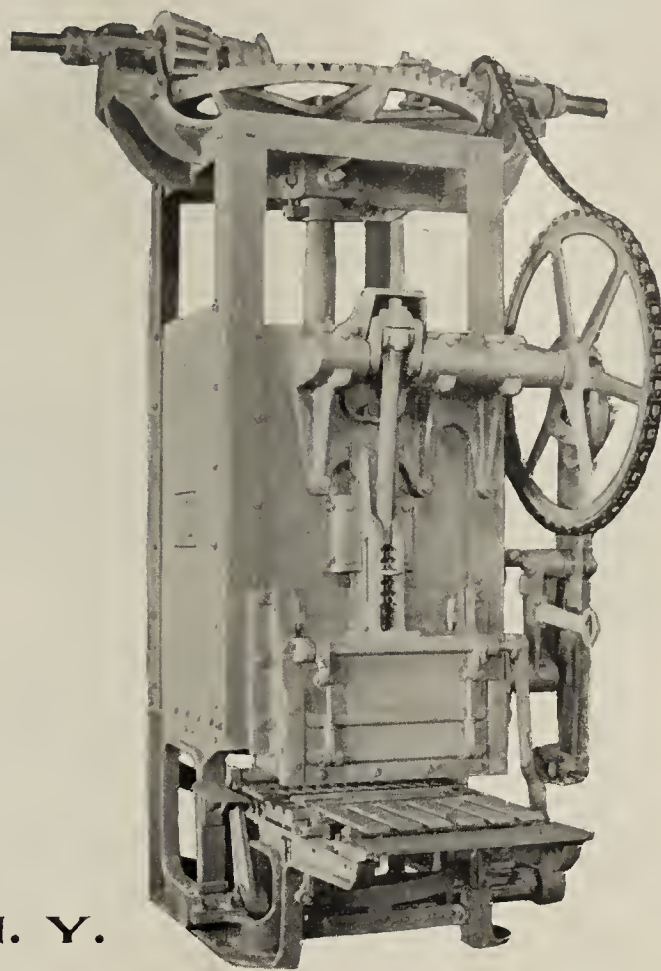
Soft Clay Process.

...

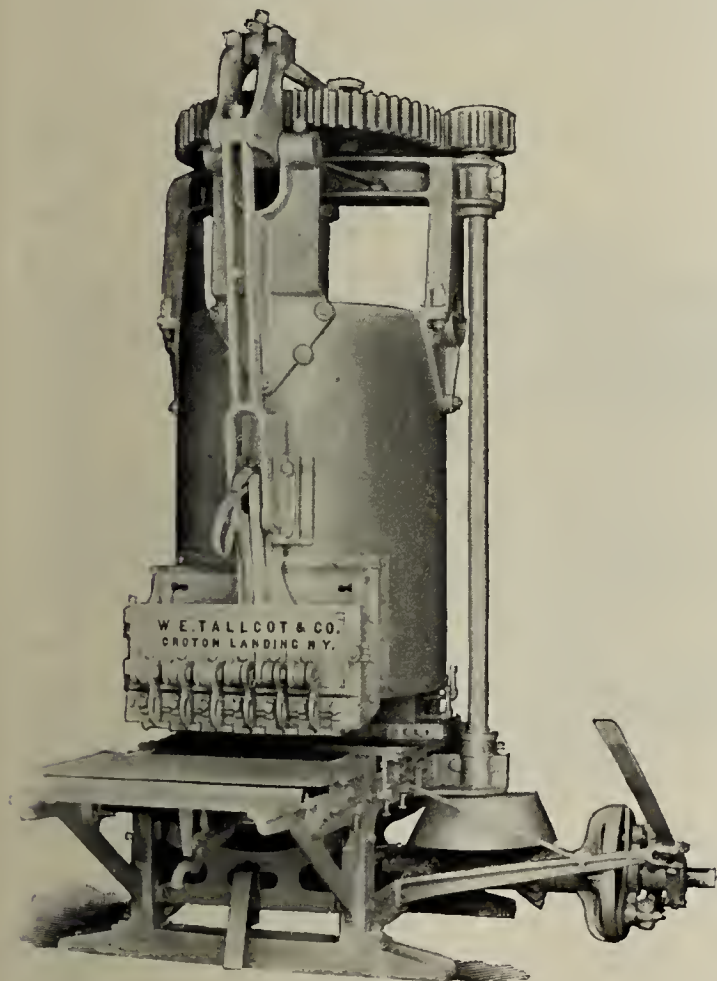
We solicit your inquiries, address

W. E. Tallcot & Co.,

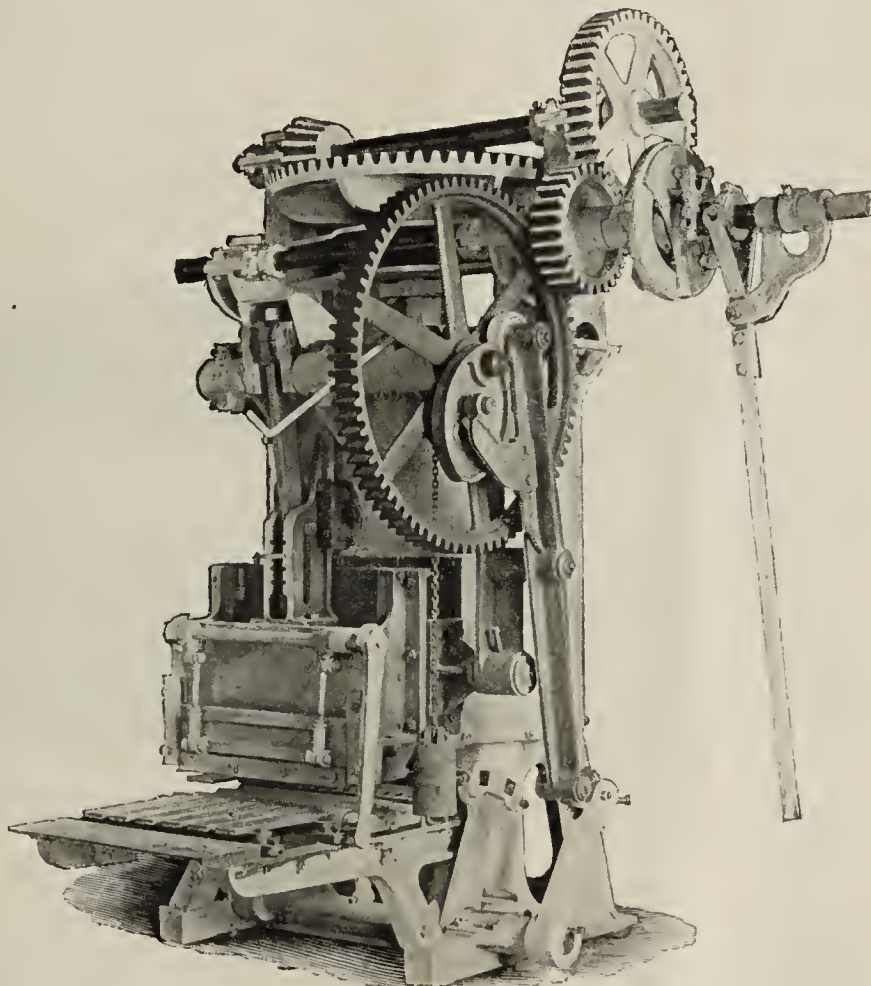
Croton-on-Hudson, N. Y.



The "Hudson River."



The "I X L."



The "Croton."

Neat, Pretty and Just as Good as They Look.

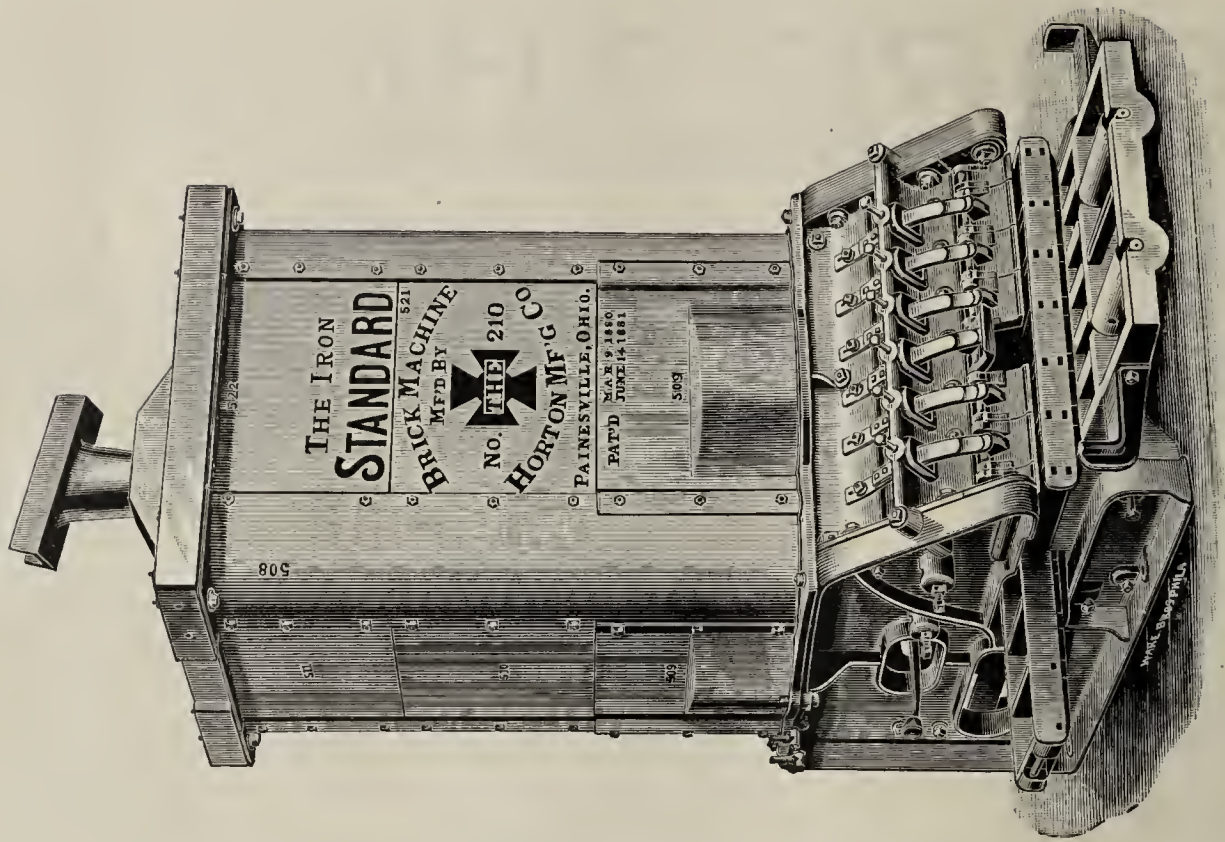
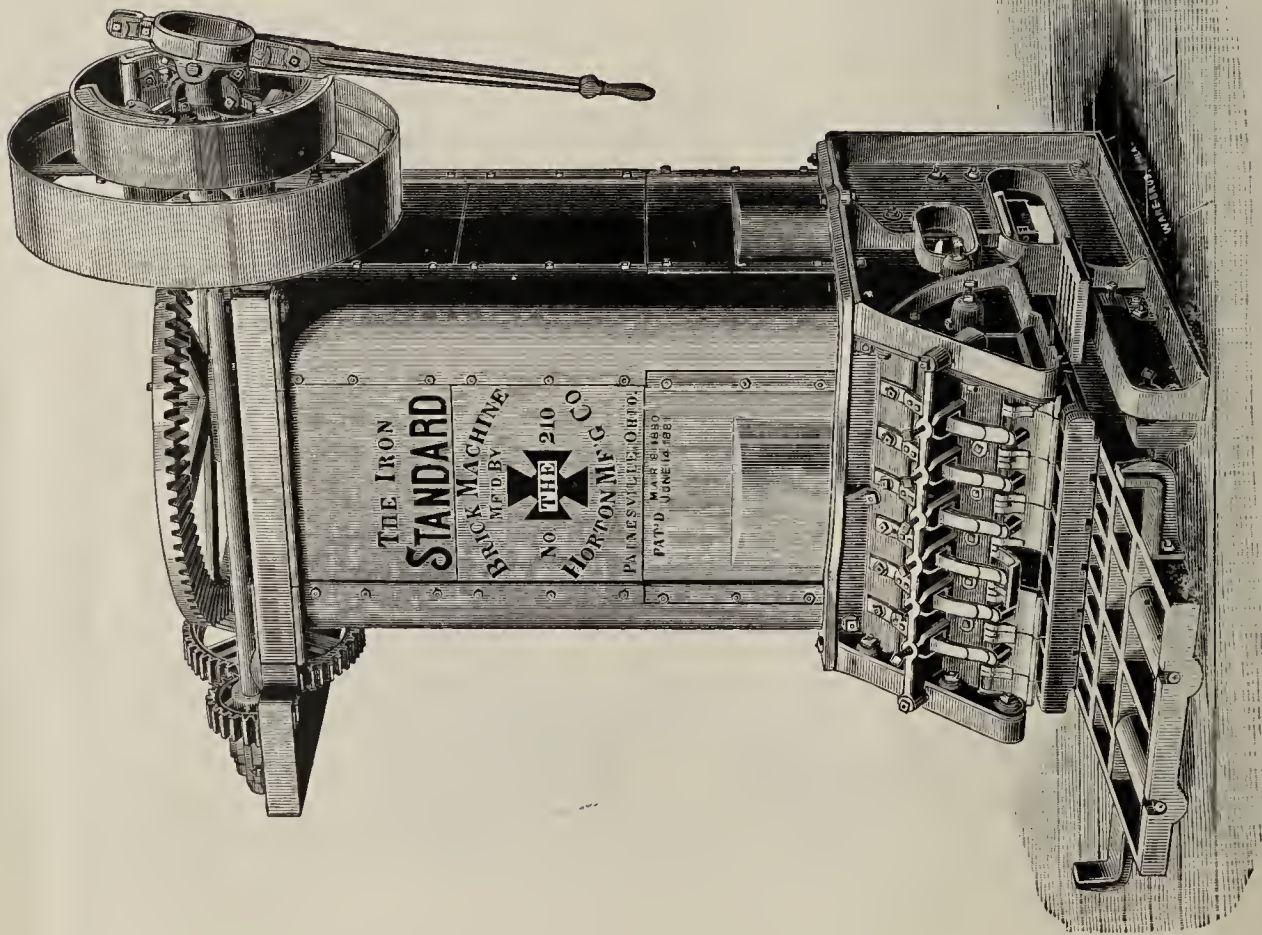


THE PRICES
ARE AWAY
DOWN IN
REACH OF ALL.

♣ We are now making a strictly Iron and Steel Machine, not even the sills are made of wood. It is not only one of the best working machines but one of the nicest looking machines on the market.

♣ If in need of a Pug Mill, Disintegrator, Conveyor, etc., write us for rock bottom prices.

GET A COPY
OF OUR NEW
CATALOGUE.



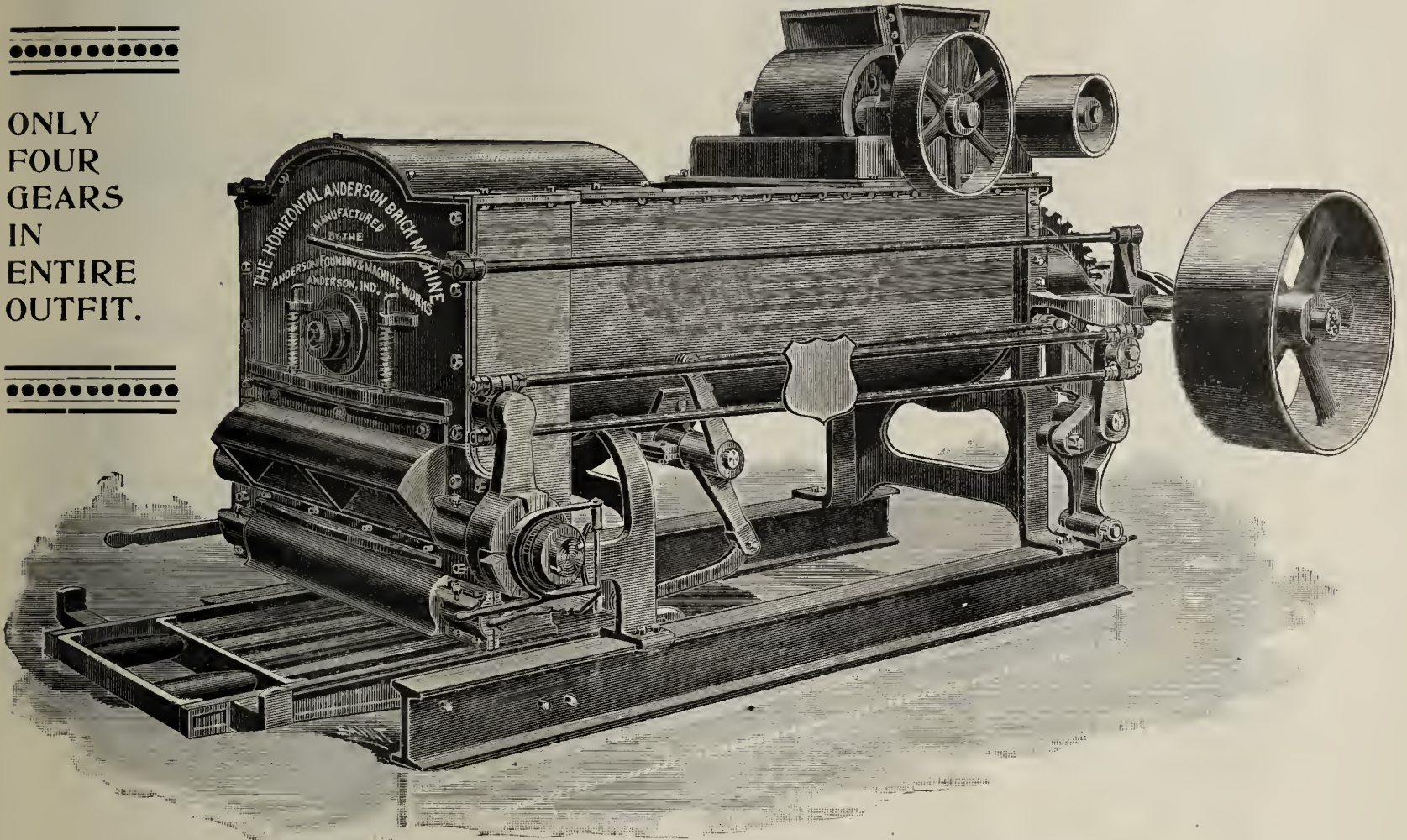
THE HORTON MANUFACTURING CO., = Painesville, Ohio.

DON'T

Greatest Pressure and Puging Capacity.

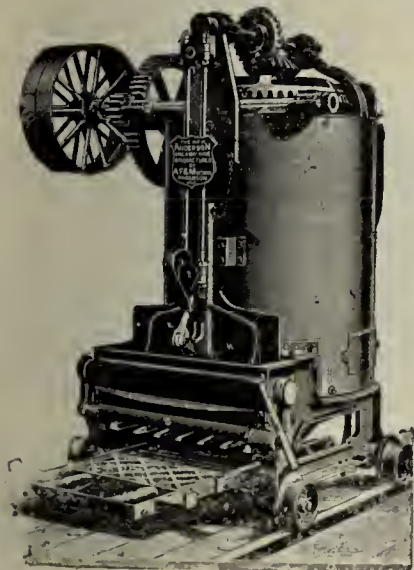
Buy a Brick Machine Shop until you Investigate the **Horizontal Anderson-son.** The latest—the Strongest—

ONLY
FOUR
GEARS
IN
ENTIRE
OUTFIT.



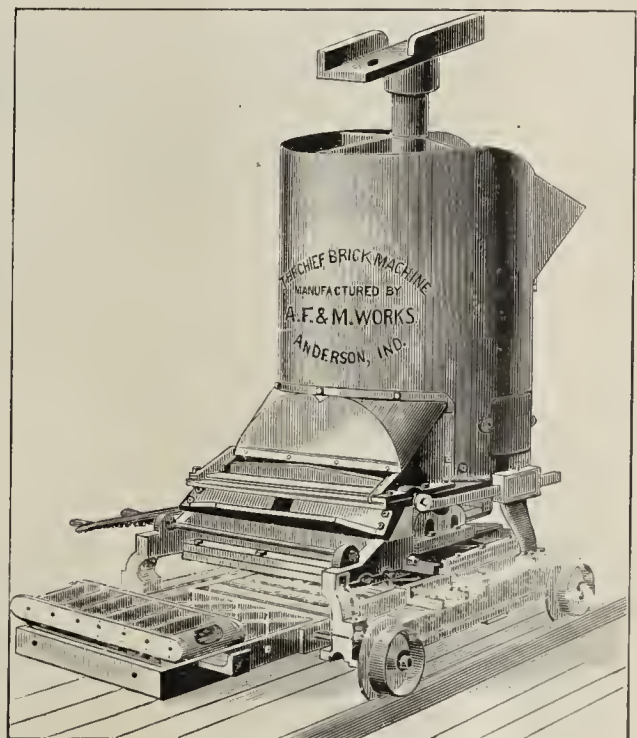
Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.

The New Departure Tile Mill



The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter.

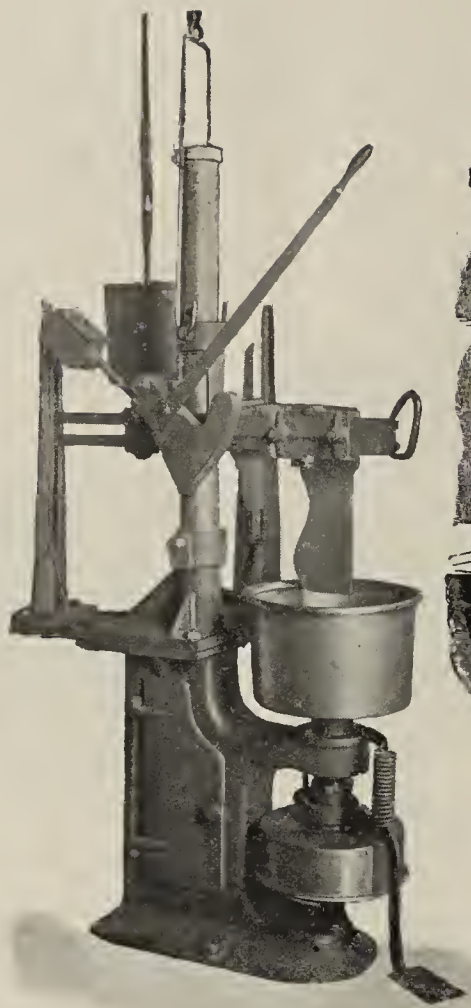
WRITE FOR CATALOGUE
AND PRICES.



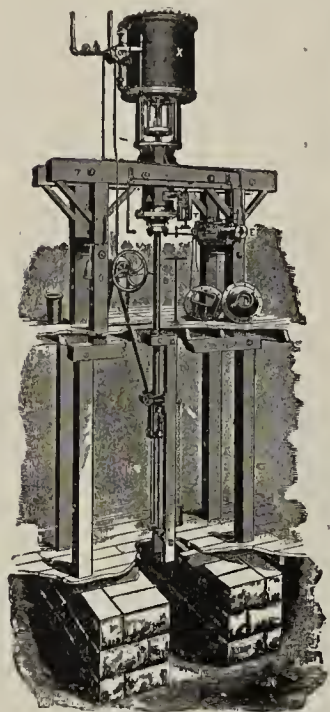
NEW IMPROVED CHIEF H. P. MACHINE.

The Anderson Foundry
& Machine Works,
ANDERSON, IND.

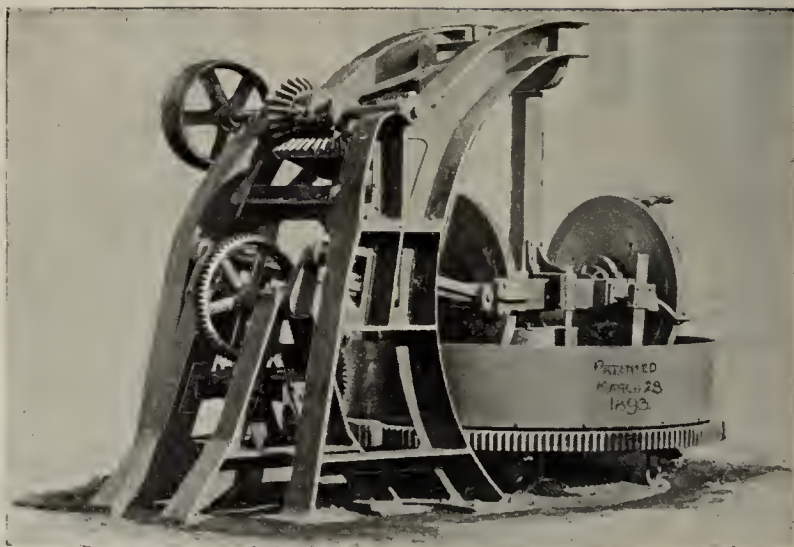
NEW ANDERSON BRICK MACHINE.
Steam Power.



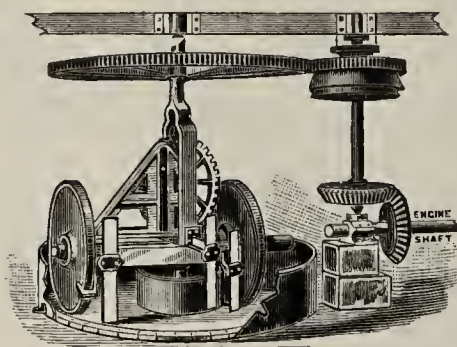
All Iron and Steel Jolly No. 3.



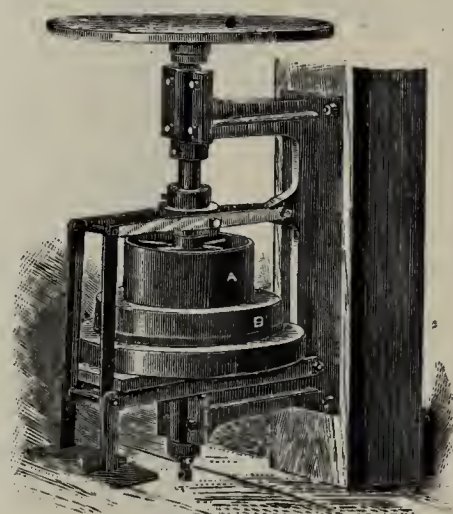
Vaughn Press.



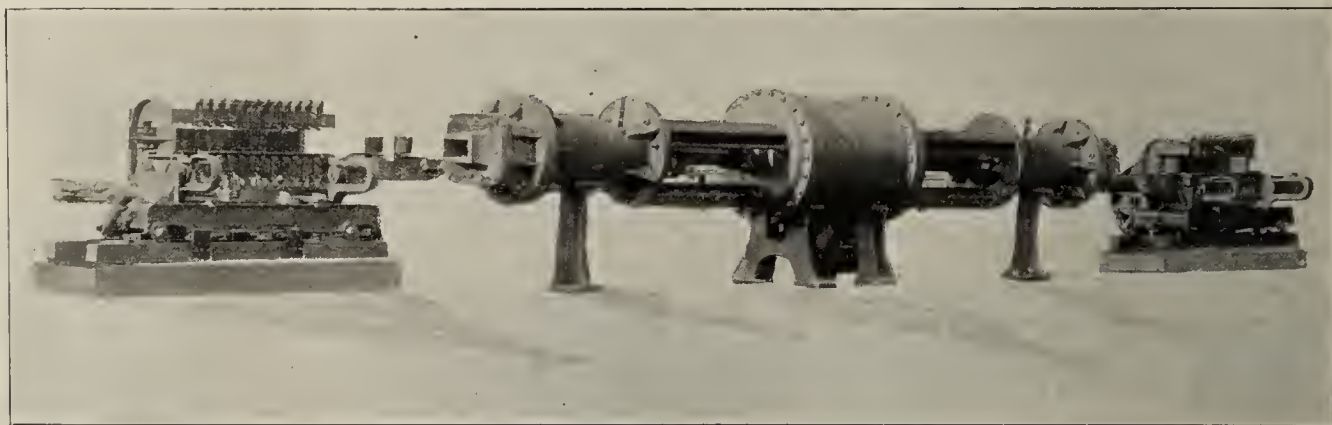
Combination Mill No. 2.



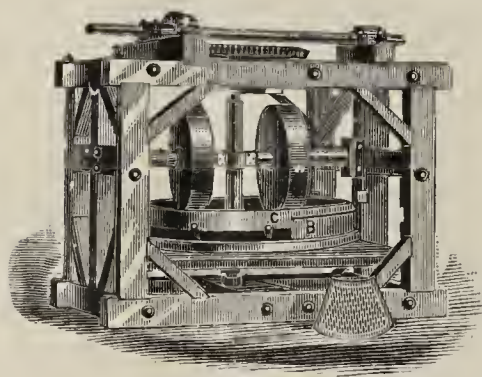
Clay Mill—Harp Pattern.



Potter's Wheel.



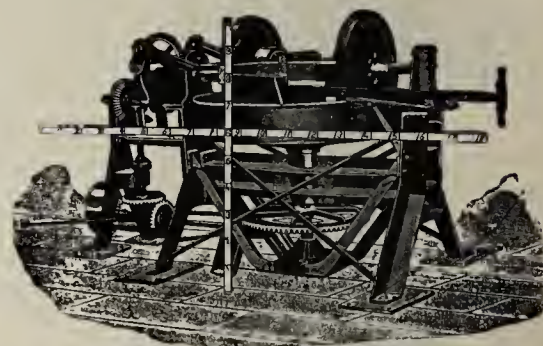
The "Cuyahoga" Double-Acting Direct Steam Pressure Brick Press No. 1.



Dry Pan.

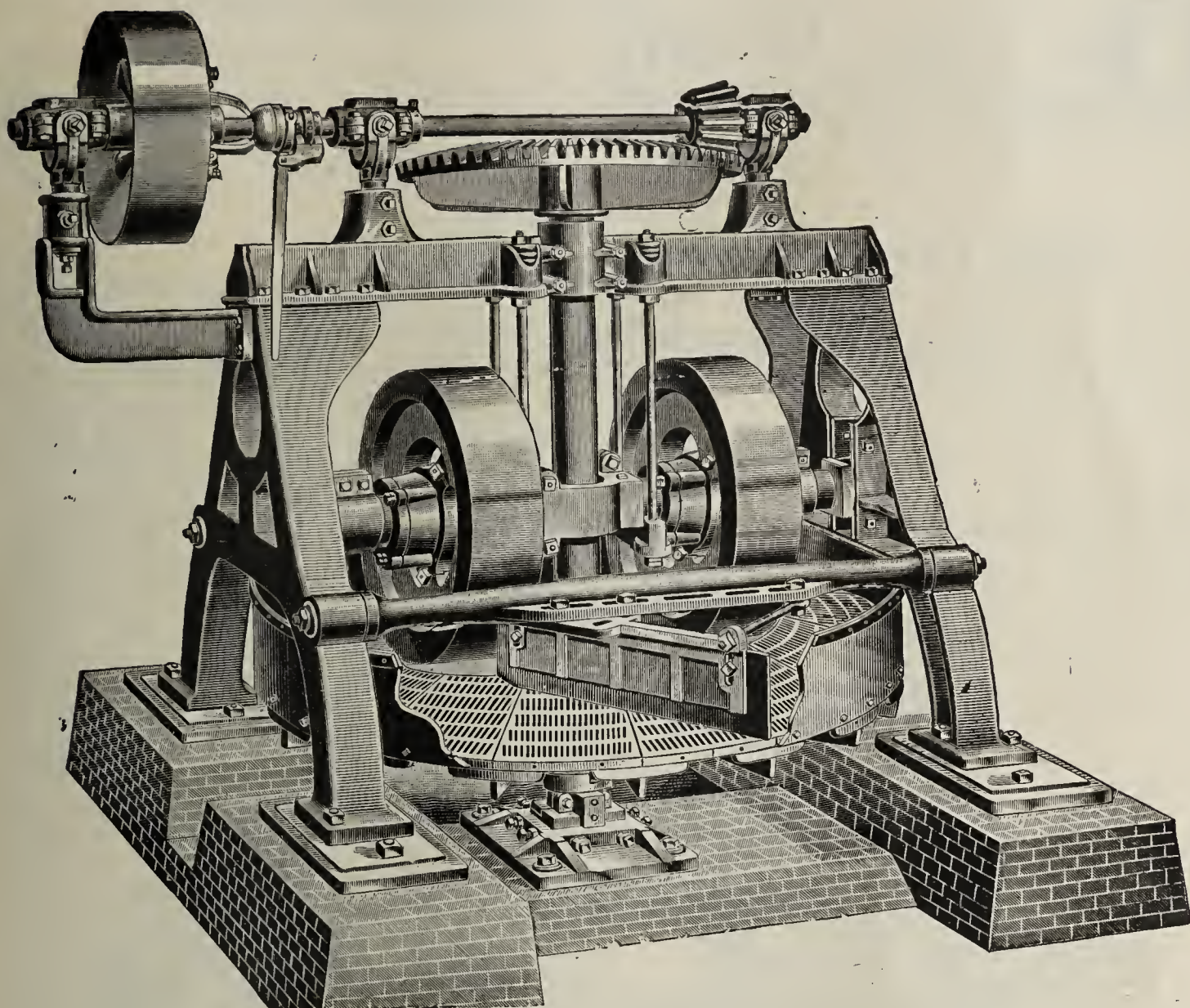
IF you want any kind
of Clayworking Ma-
chinery or device get
our prices.

Catalogue Free.



"Cuyahoga" Combination Mill, No. 1.

The Turner, Vaughn & Taylor Co., Cuyahoga, Falls, Ohio.



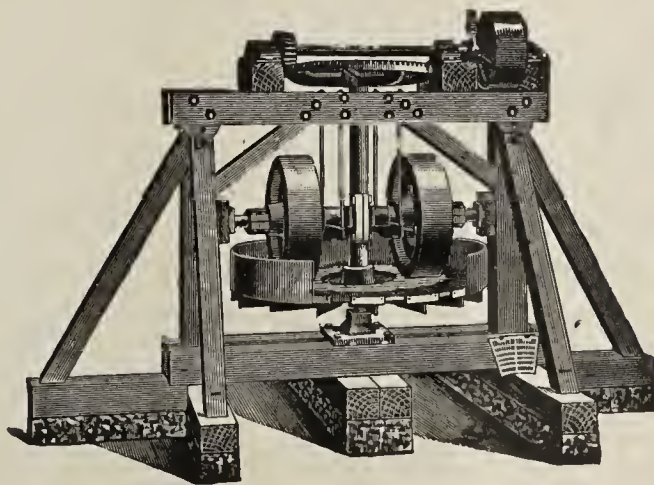
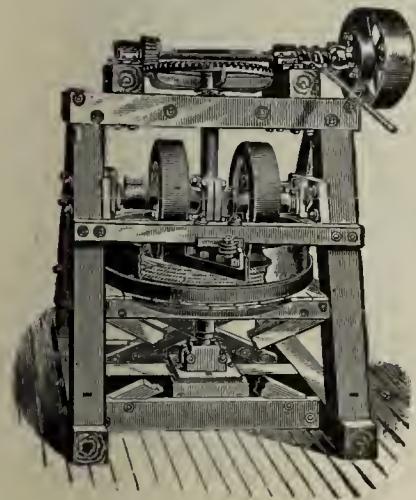
OUR SPECIALTY IS

DRY PANS.

IRON FRAMES,
WOOD FRAMES.

~~~~~  
All Sizes and Price  
to suit  
Any Size Plant.  
~~~~~

.....SEND FOR NEW ILLUSTRATED CATALOGUE.....



FROST ENGINE CO., Galesburg, Ill.,
U. S. A.

Do You Want

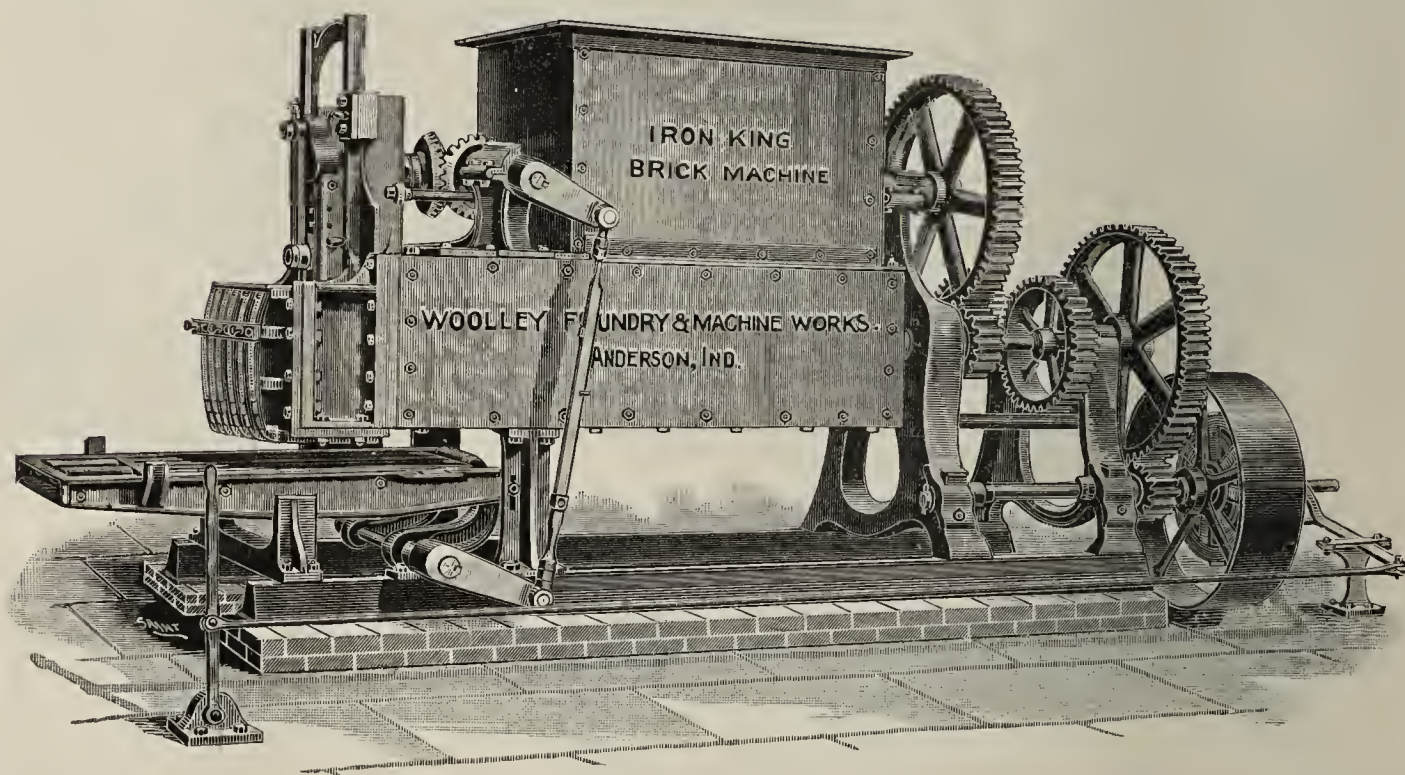
A BRICK MACHINE
..... A DRY PAN
..... A PUG MILL?

IF SO, BE SURE AND LOOK INTO THE MERITS OF

The Iron King A BRICK MACHINE that has never made a failure.

**The Woolley Dry Pan,
The Woolley Pug Mill,**

•✠All of these Machines have proven equal to any and Superior to most on the Market.✠•



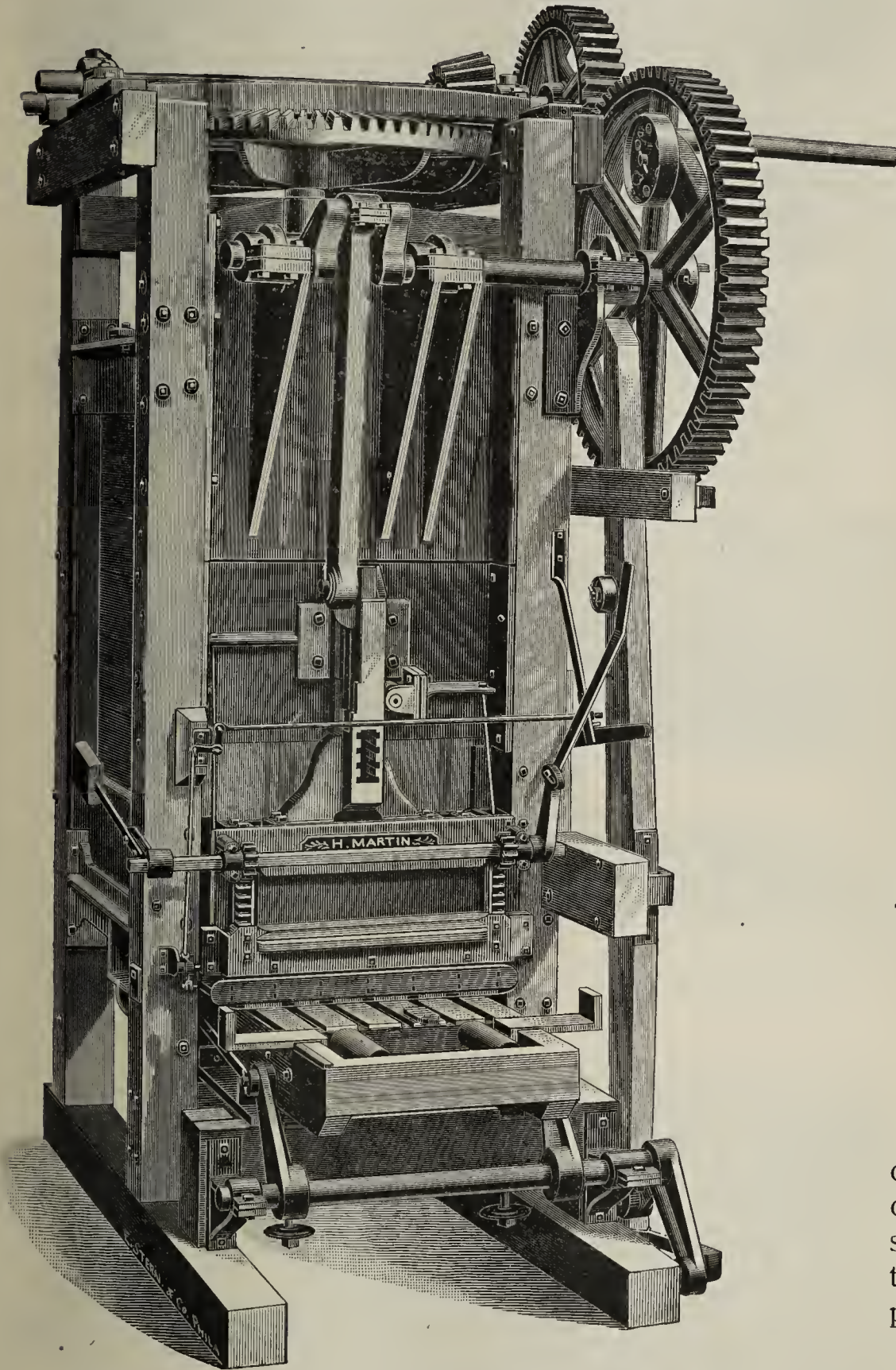
THIS is a non-breakable machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ability of every part.

We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

It will afford us pleasure to quote you prices.



The MERITS OF THE Martin Brick Machines



Have been fully established throughout the entire United States and the following demonstrates how well they have taken the lead. We have already placed in

Buffalo, N. Y.,	41 machines.
Cleveland, O.,	22 "
Pittsburgh, Pa.,	73 "
Philadelphia, Pa.,	35 "
Baltimore, Md.,	14 "
Detroit, Mich.,	5 "
Matawan, N. J.,	21 "
Lancaster, Pa.,	9 "
Rochester, N. Y.,	18 "
Toledo, O.,	13 "
Binghamton, N. Y.,	5 "
New Haven, Conn.,	19 "
Brookfield, Mass.,	9 "
Salt Lake City, Utah,	11 "
Butte City, Mont.,	8 "
Bozeman, Mont.,	4 "

The most of which are in constant use during the brickmaking season. . . . They are built for

Strength,
Durability and
Large Output

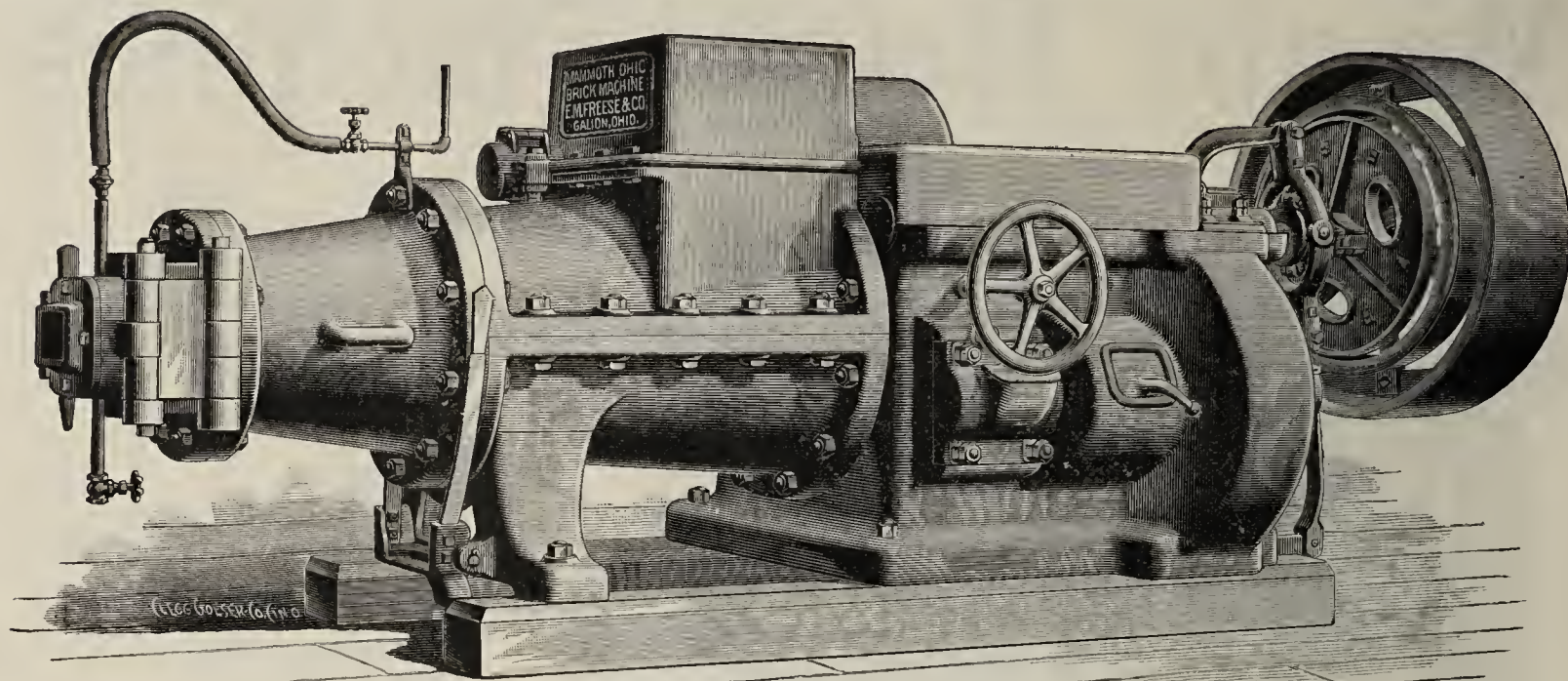
of work, and are capable of moulding the clay very stiff, requiring comparatively a small amount of power.

The Henry Martin Brick Machine Mfg. Co.,
Incorporated.

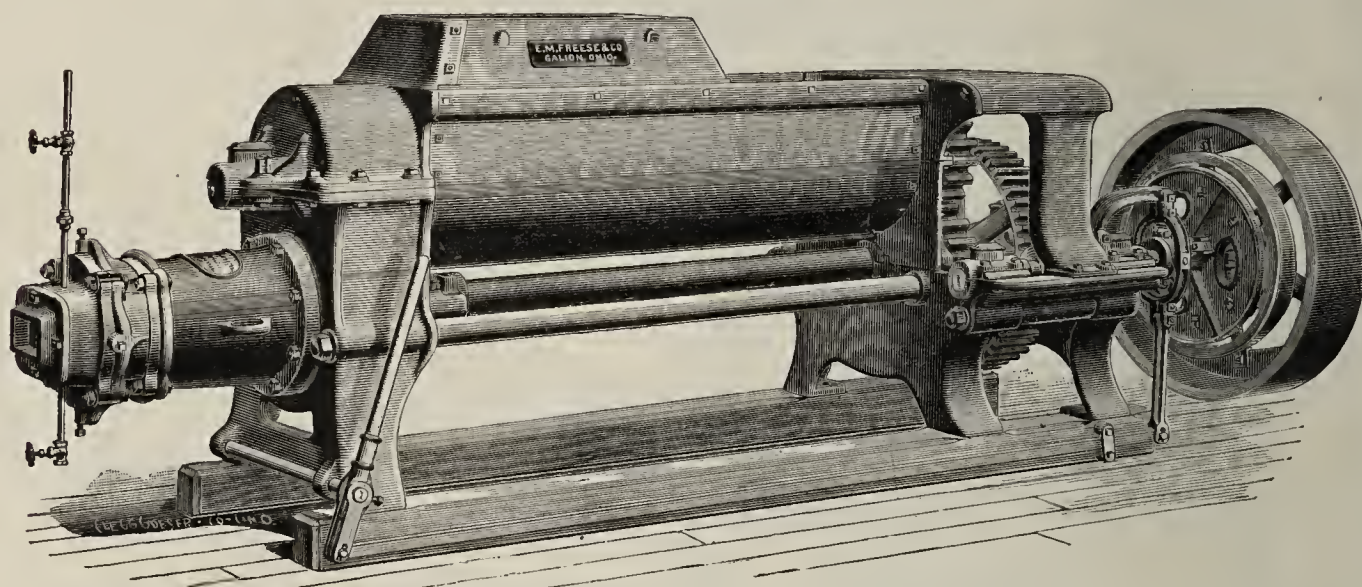
Mention the Clay-Worker.

Lancaster, Penna., U. S. A.

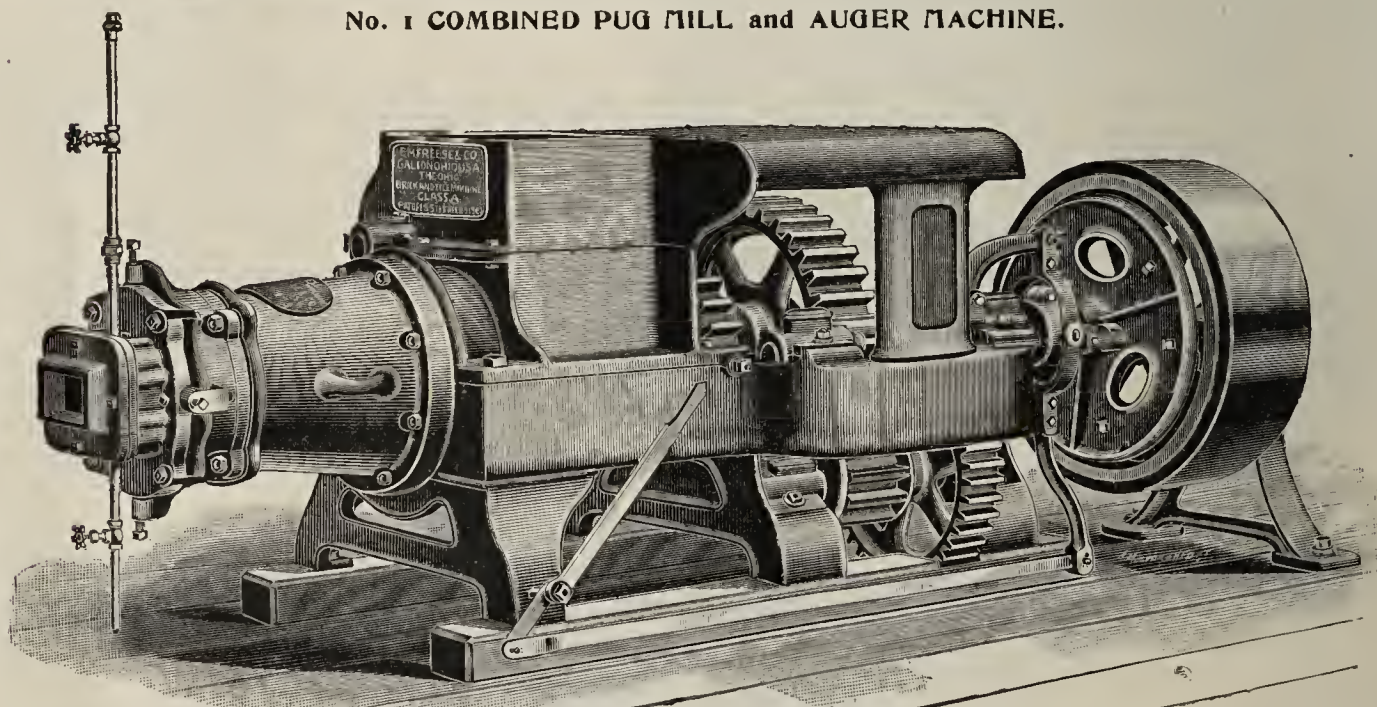
E. M. FREESE & CO., GALION, OHIO.



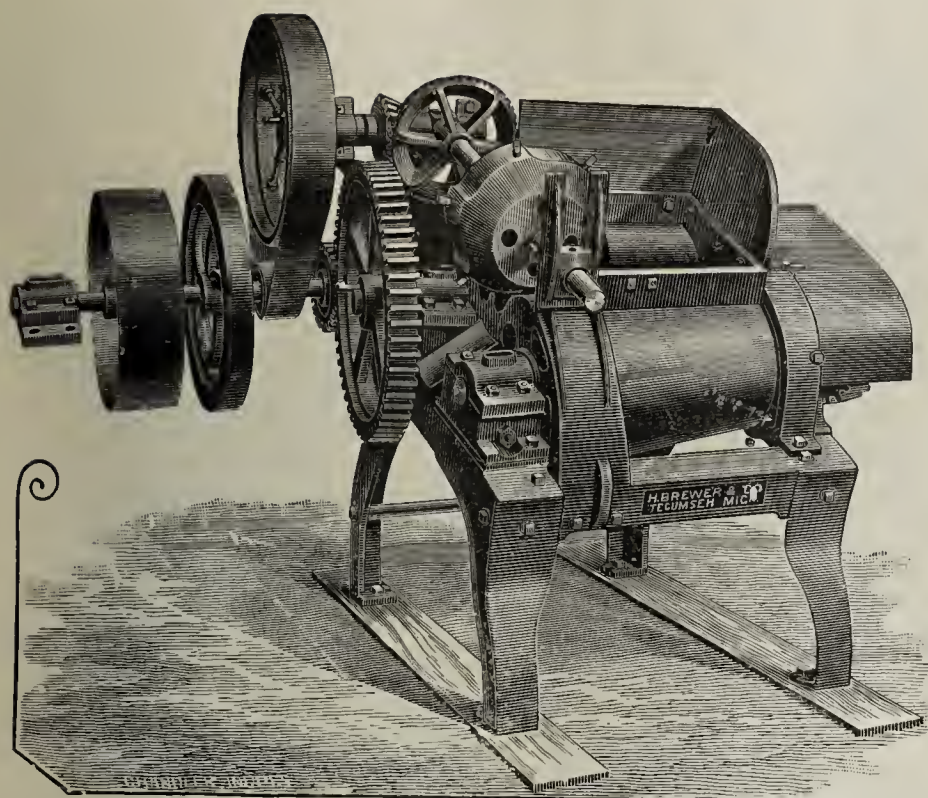
MAMMOTH BRICK MACHINE.



No. 1 COMBINED PUG MILL and AUGER MACHINE.



IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

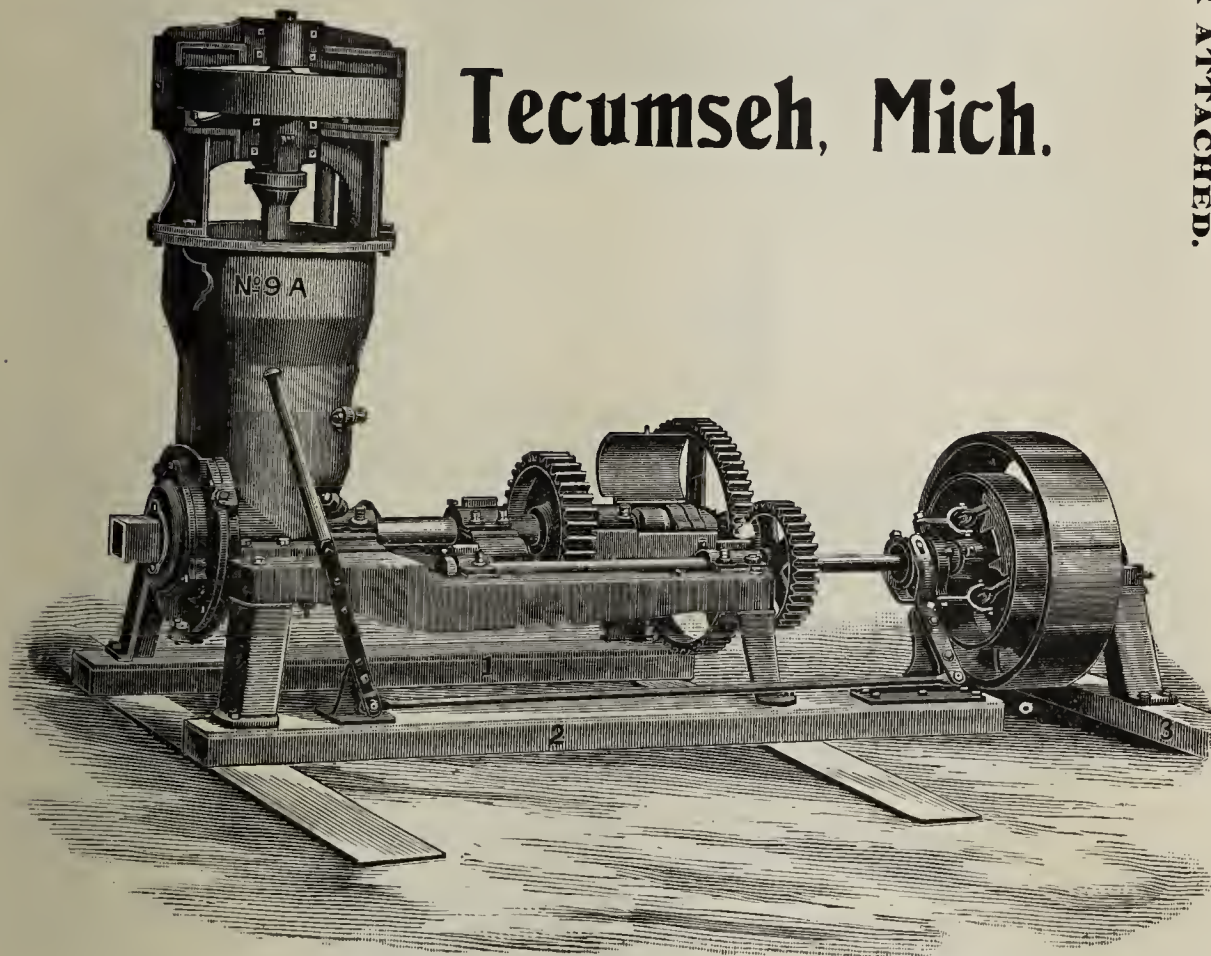


STONE EXTRACTING CLAY CRUSHER.

Manufactured by

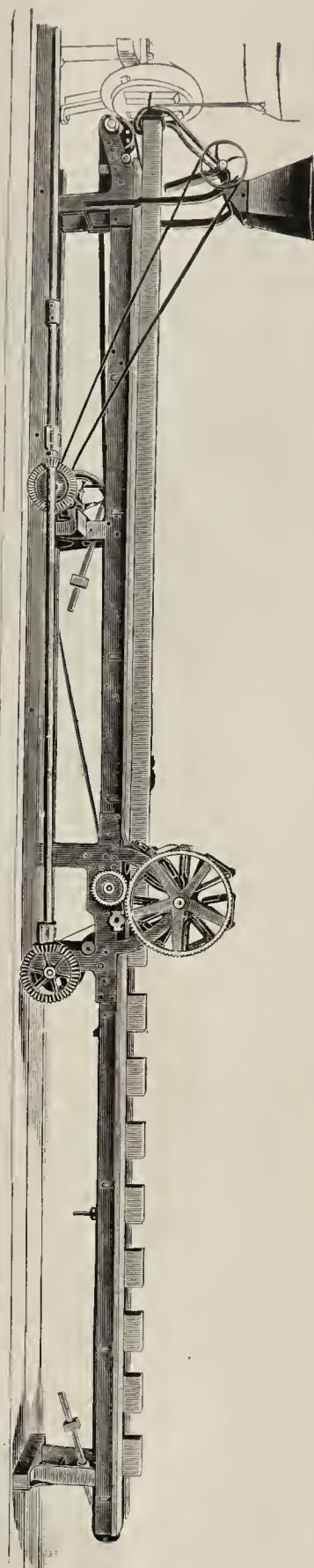
H. Brewer & Co.,

Tecumseh, Mich.



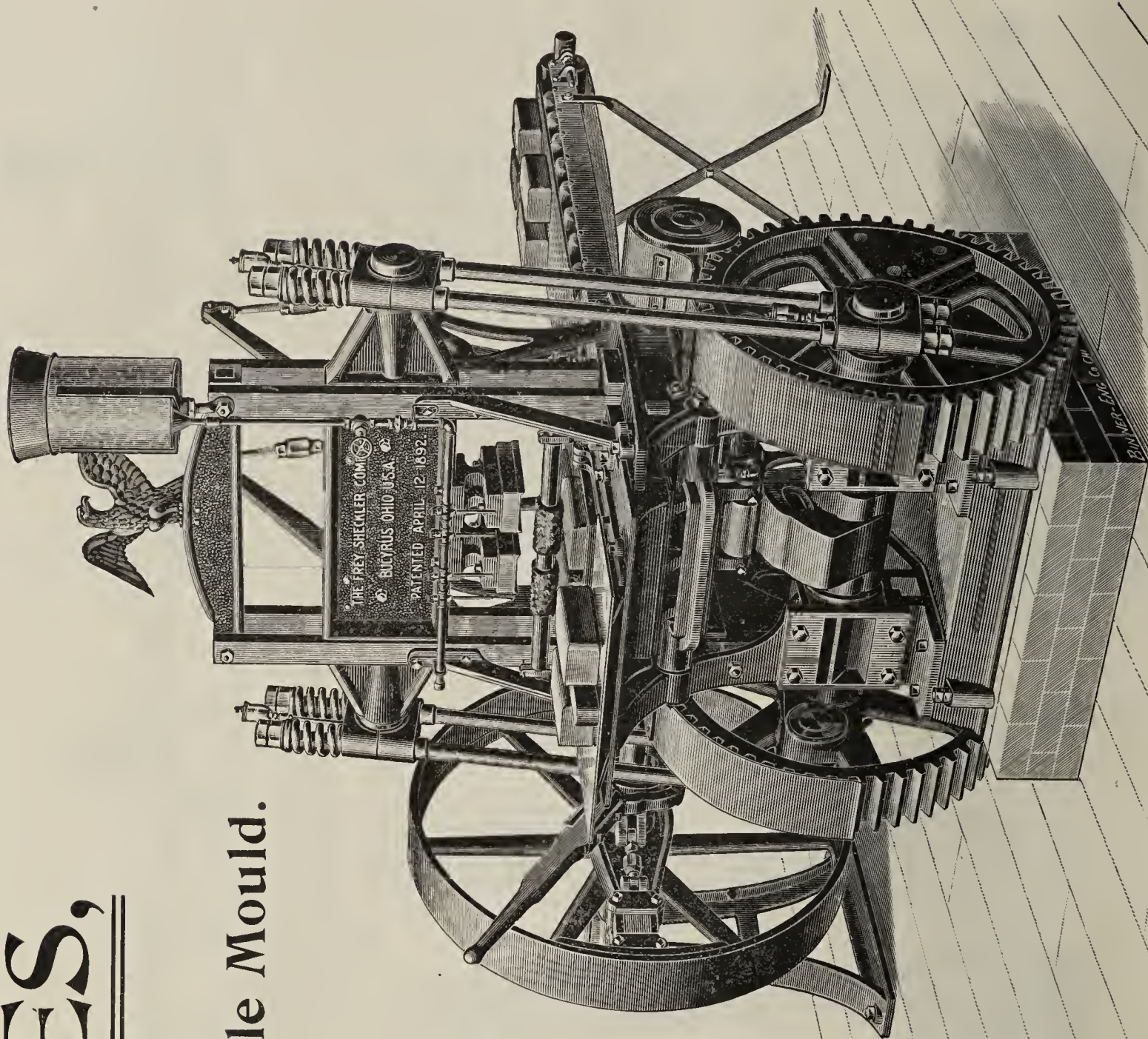
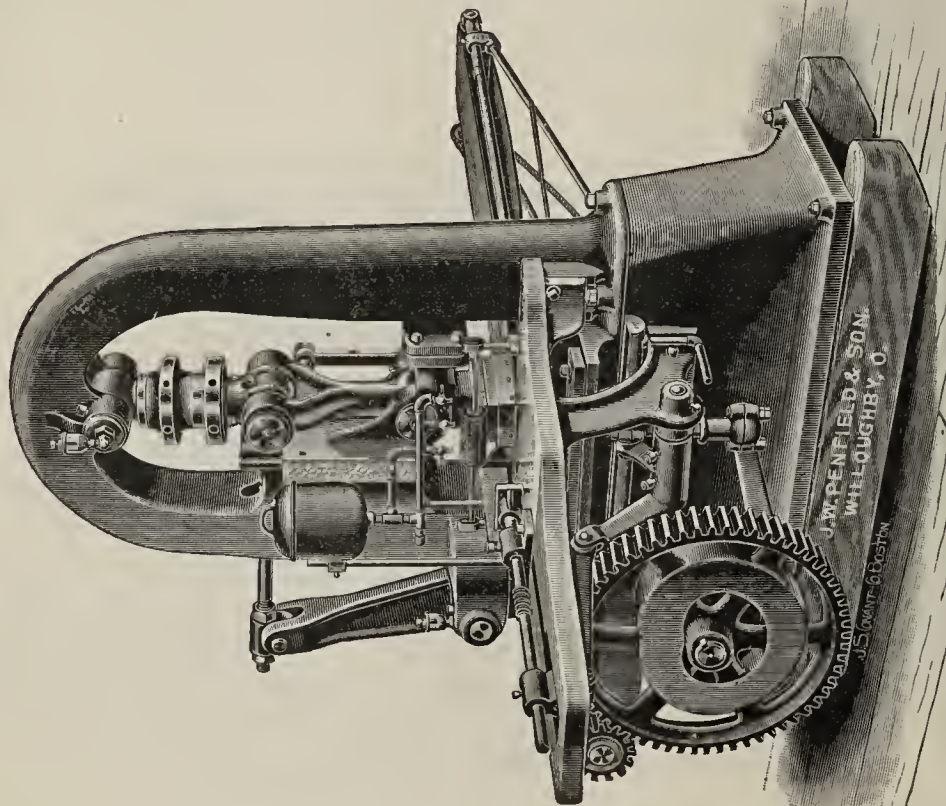
No. 9 "A" BRICK MACHINE.

AUTOMATIC END CUT BRICK CUTTER WITH SANDER ATTACHED.



RE-PRESSES,

For Stiff Mud Brick,
With Single or Double Mould.

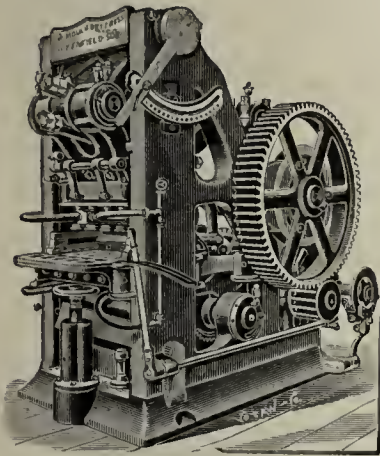


Send for Complete Catalogue.

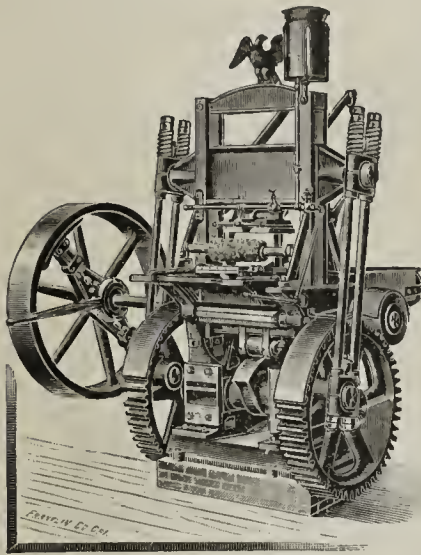
The American Clay-Working
Machinery Company,

BUCYRUS, OHIO, U. S. A.

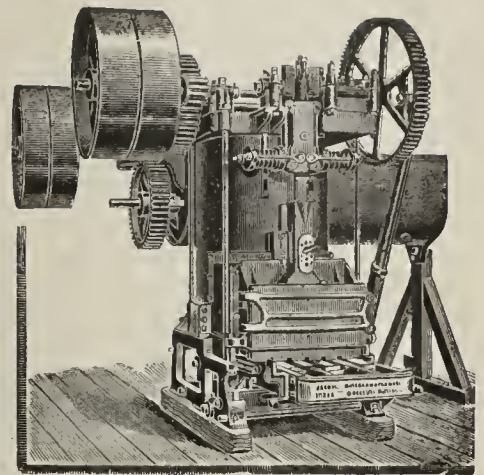
Some of Our Goods.



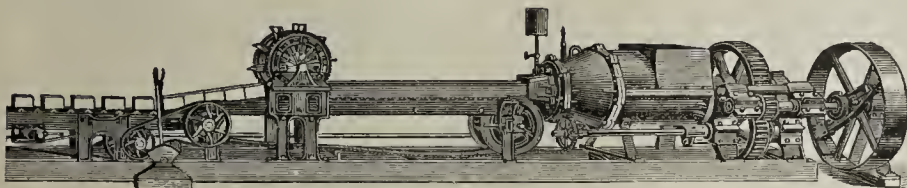
Dry Press Brick Machines.



Brick Re-Presses.



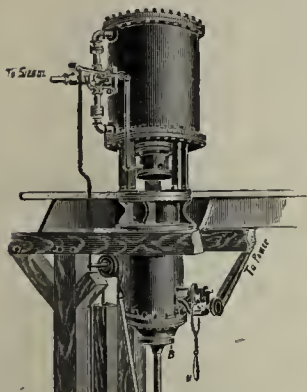
Sand Mold Brick Machines.



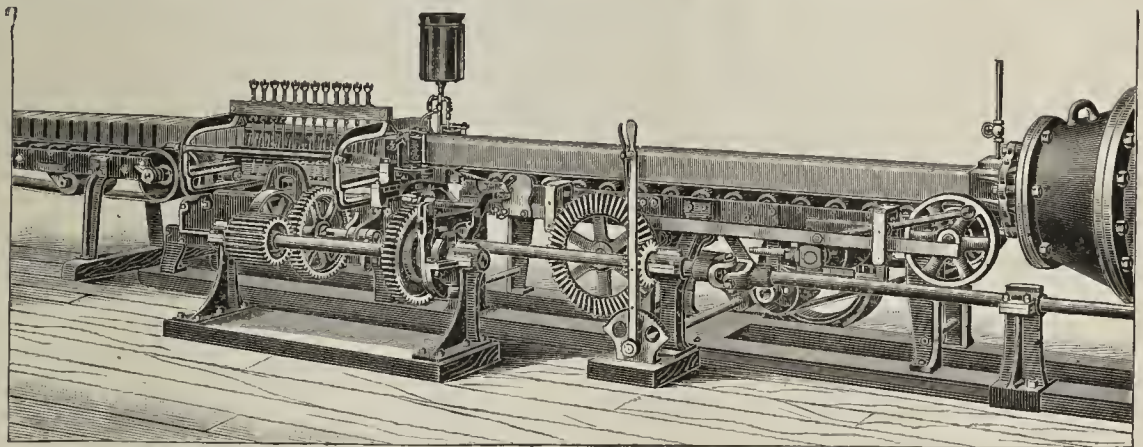
Auger Brick and Tile Machines.



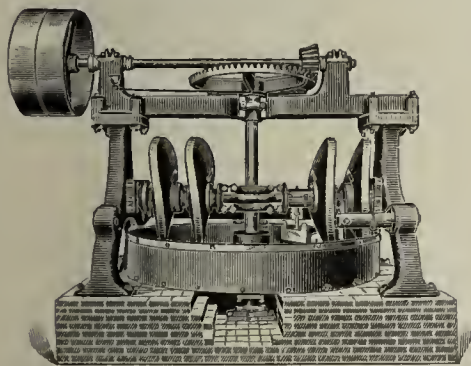
Pug Mills.



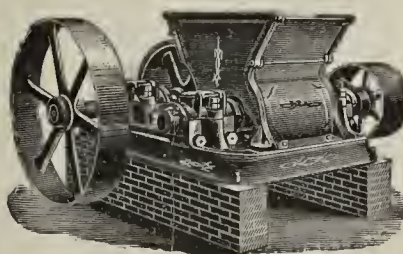
Sewer Pipe Presses.



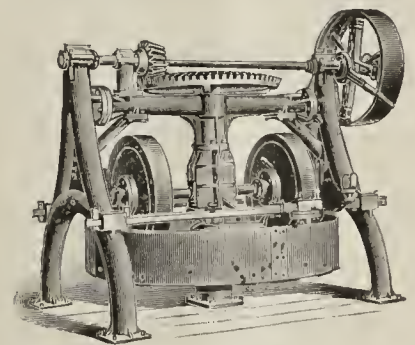
Automatic and Hand Power Brick Cutters.



Special Clay Grinding Mills.



Disintegrators.

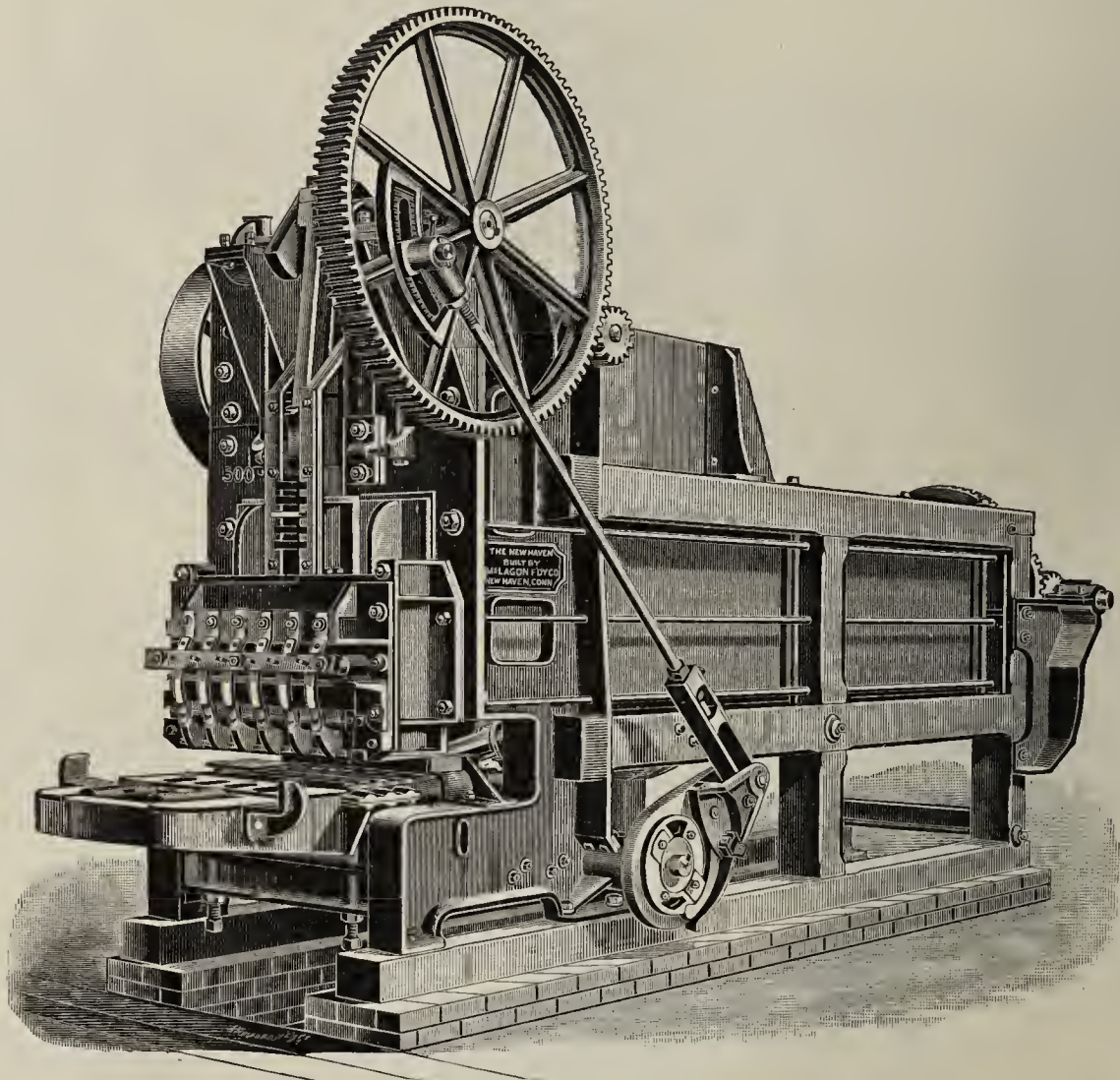


Dry and Wet Pans.

Send for Our Complete Catalogue.

The American Clay-Working Machinery Co.,
BUCYRUS, OHIO, U. S. A.

Another "New Haven" Record.



NEW HAVEN, CONN., December 2, 1896.

THE EASTERN MACHINERY CO.,

Gentlemen:—It affords us great pleasure in giving our testimony in favor of your brick machine which we have now used two seasons, without break or bill of repairs. It has made its 40,000 daily without extra attention, and we are more than satisfied with it, and next season we expect to put in another machine of your make. You can refer anyone to us, and we will answer inquiries with pleasure.

Yours respectfully,

CHARTER OAK BRICK CO.,

JOHN E. HEALY, President.

Many More Like This. —

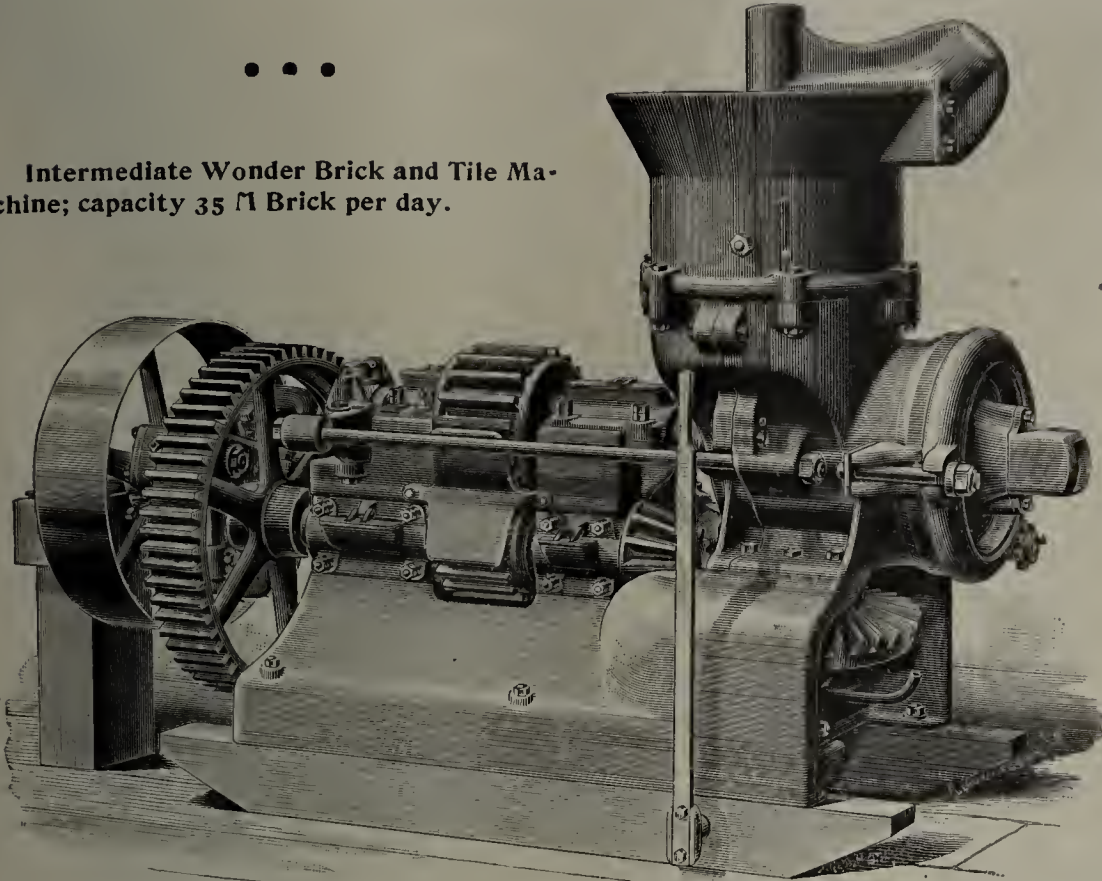
The Eastern Machinery Co.,

NEW HAVEN, CONN.

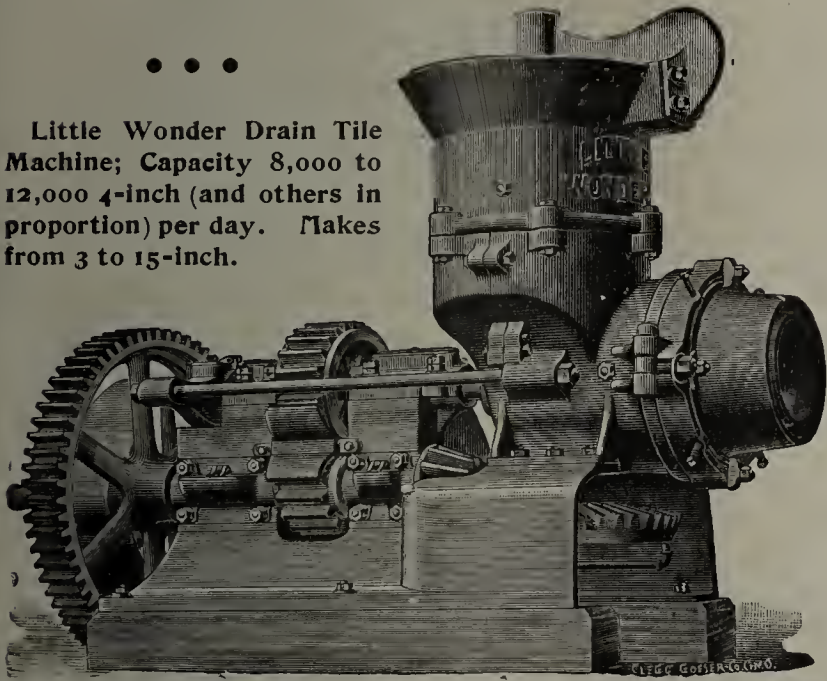
WONDER MACHINERY,

For Brick
and Tile.

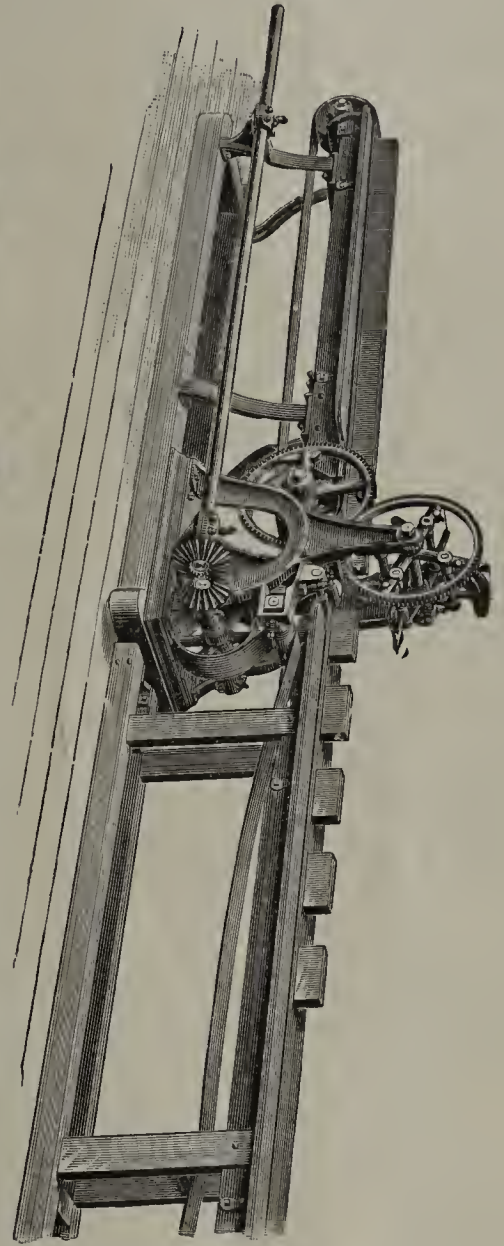
Intermediate Wonder Brick and Tile Machine; capacity 35 M Brick per day.



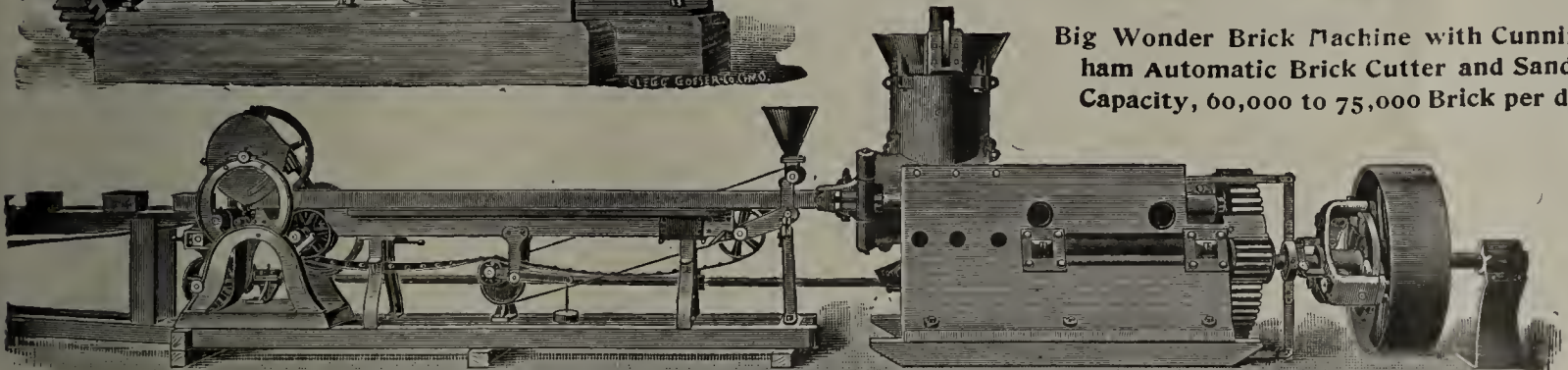
Little Wonder Drain Tile Machine; Capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



Cunningham's Single Stream Automatic
End Cut Brick Cutter.



Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 60,000 to 75,000 Brick per day.



AS MANUFACTURED BY

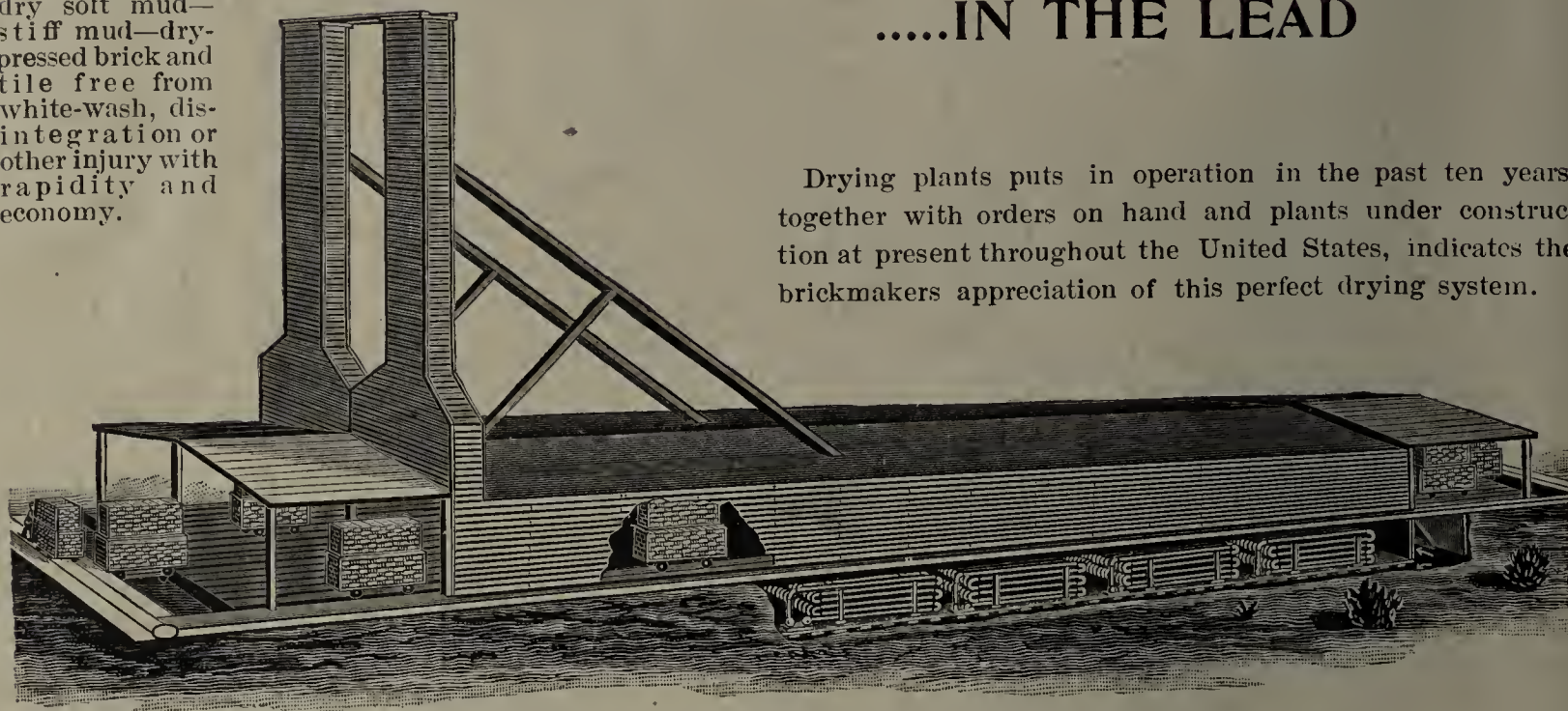
The Wallace Manufacturing Co.,

Send for No. 14 Catalogue for further particulars.

FRANKFORT, IND.

Iron Clad Dryer

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



.....IN THE LEAD

Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

SEE WHAT THEY SAY:

DALE-GOODWIN PRESSED BRICK CO.

DIRECTORS:

MANUFACTURERS OF

Robt. Goodwin, President.
F. H. Parmenter, Vice-Pres.
E. E. Dale, Sec. and Treas.
Daniel Embree.
Frank Dale.

Building Brick.

FINE FRONT BRICK A
SPECIALTY.

Telephone 394. 100 S. Fifth St.
Lock Box 303.

D. WARREN De ROSAY,

STEAM BRICK MANUFACTURER,

Cambridge, Mass.

OFFICE AND WORKS
62, 64, 66 Dublin St.
Telephone 532-4 Cambridge.

BOSTON OFFICE
17 Otis Street.
Telephone 1892 Boston

DES MOINES, IA., July 20, 1896.

WOLFF DRYER CO., Chicago, Ill.

GENTLEMEN—The four-track dryer bought of you has reduced the length of time in water smoking from seven and eight days to three days, evaporating from seven to nine ounces from each brick of standard size.

Our contract was for a capacity of thirty thousand standard brick per day; the dryer will easily do this.

Very truly yours,

DALE-GOODWIN PRESSED BRICK CO.,

E. E. DALE, Sec. and Treas.

CAMBRIDGE, MASS., July 29, 1896.

WOLFF DRYER CO., Chicago, Ill.

GENTLEMEN—I have used your six-track dryer since April 15, 1896, and am pleased to say that it gives entire satisfaction. It was built for a capacity of 25,000 soft mud brick per day, but at present I am running at the rate of 30,000 "BONE DRY BRICK" daily. I must confess that with this dryer the art of brick making is reduced to a science, and that the days of open yards are numbered.

Wishing you more success of the kind, I remain,
Respectfully,

D. WARREN DE ROSAY.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.



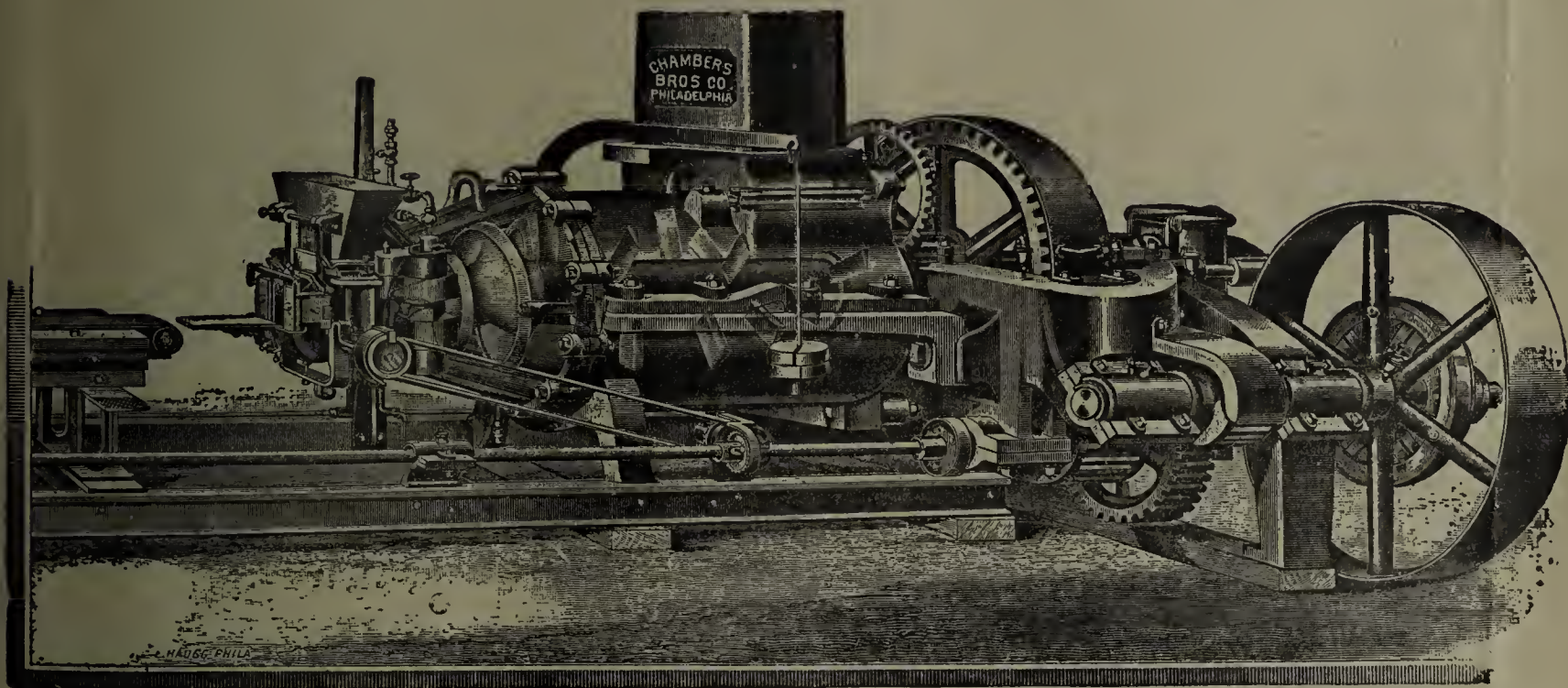
THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVII, No. 3.

INDIANAPOLIS, IND., MARCH, 1897.

\$2.00 a Year in Advance.

Brick Making Machinery.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,

174 South Clinton Street.

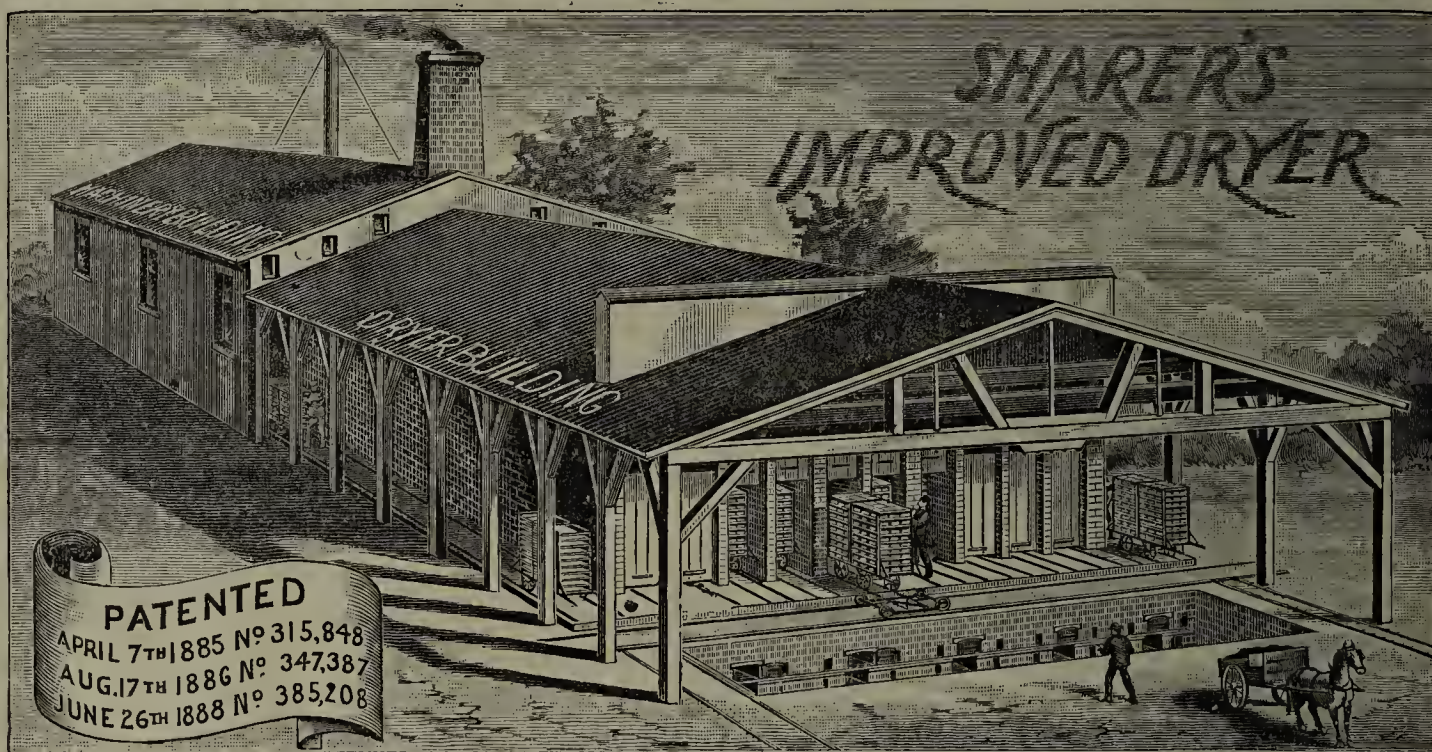
PHILADELPHIA, PA.

Geo. W. Sharer,

Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.

Sharer's Improved Dryer Saves Fuel, Saves Brick, Saves
Time, Saves Money.

Sharer's Improved Calorific Kiln Burns the Largest Per
Cent of Hard Brick at the Lowest Cost for Fuel.



ECONOMY is the Road to Success in all manufacturing lines particularly in brick-making. To insure the highest measure of success clayworkers must use the best and most economical appliances, for therein lies the key to a profitable business. Many years experience enables me to build and equip new brick plants or remodel old ones on practical lines that insures the largest and best output at the least expense.

Complete plants a specialty.

Clays tested and estimates furnished free of charge.

Address,

GEO. W. SHARER,

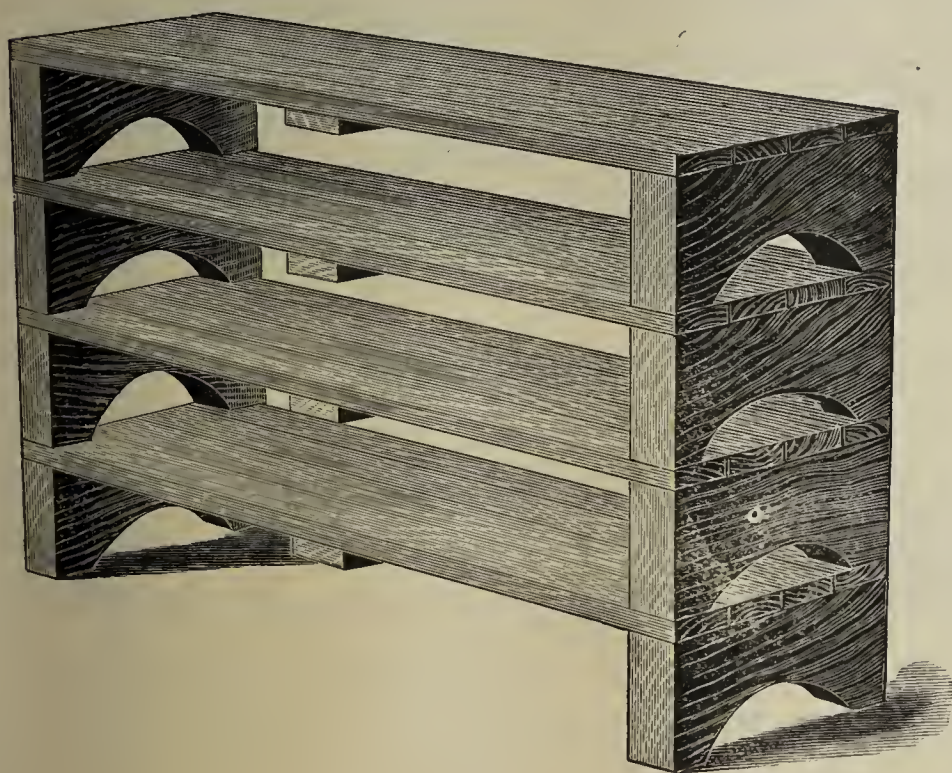
2224 Tioga Street,

PHILADELPHIA, PENN.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.



IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.

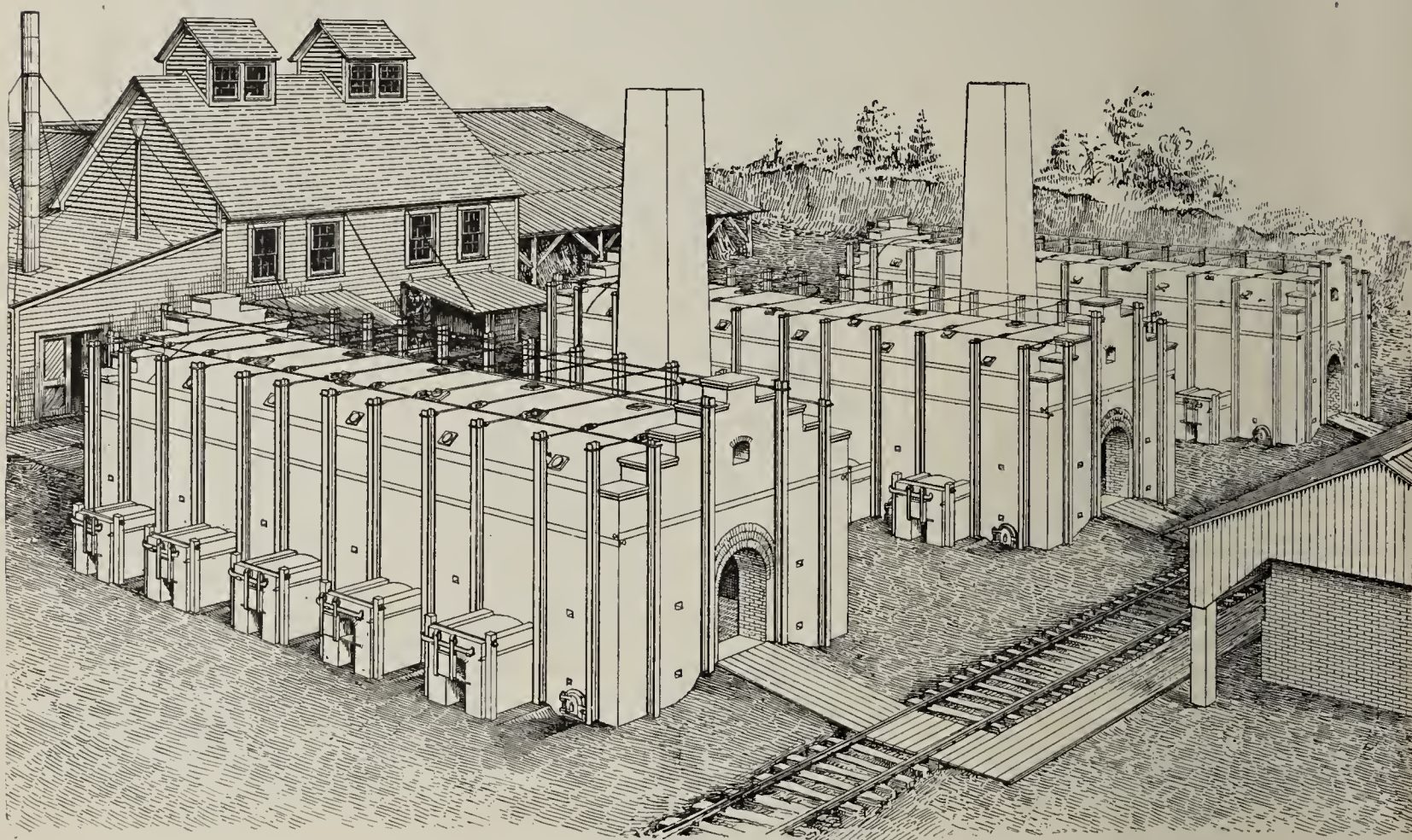
Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., = Saginaw, East Side, Mich.

A Modern Brick Plant

Brick Plants designed by us have the highest reputation for efficiency. They are modern, up-to-date, compact, convenient in arrangement, and not encumbered with unnecessary or useless machinery or appliances.

The Boyd Presses, Flood Up and Down Draft Kilns and Self-Contained Grinding Pans are money makers and money savers, first, last and all the time.



A SURE THING.—For Wise People.

We will construct and equip a Brick Plant of any capacity desired for any responsible party, furnishing Brick Presses, Power, Kilns, Clay-preparing Machinery, Shafting, Belts, etc., and erect the necessary Buildings. We will make and burn one or more kilns of brick, and turn the Plant over to him in proper working order under guarantee of satisfactory results as to quality of product and cost per 1,000; the loss to be ours in case of failure.

CHISHOLM, BOYD & WHITE CO.,

OFFICE AND WORKS:
57th and Wallace Streets.

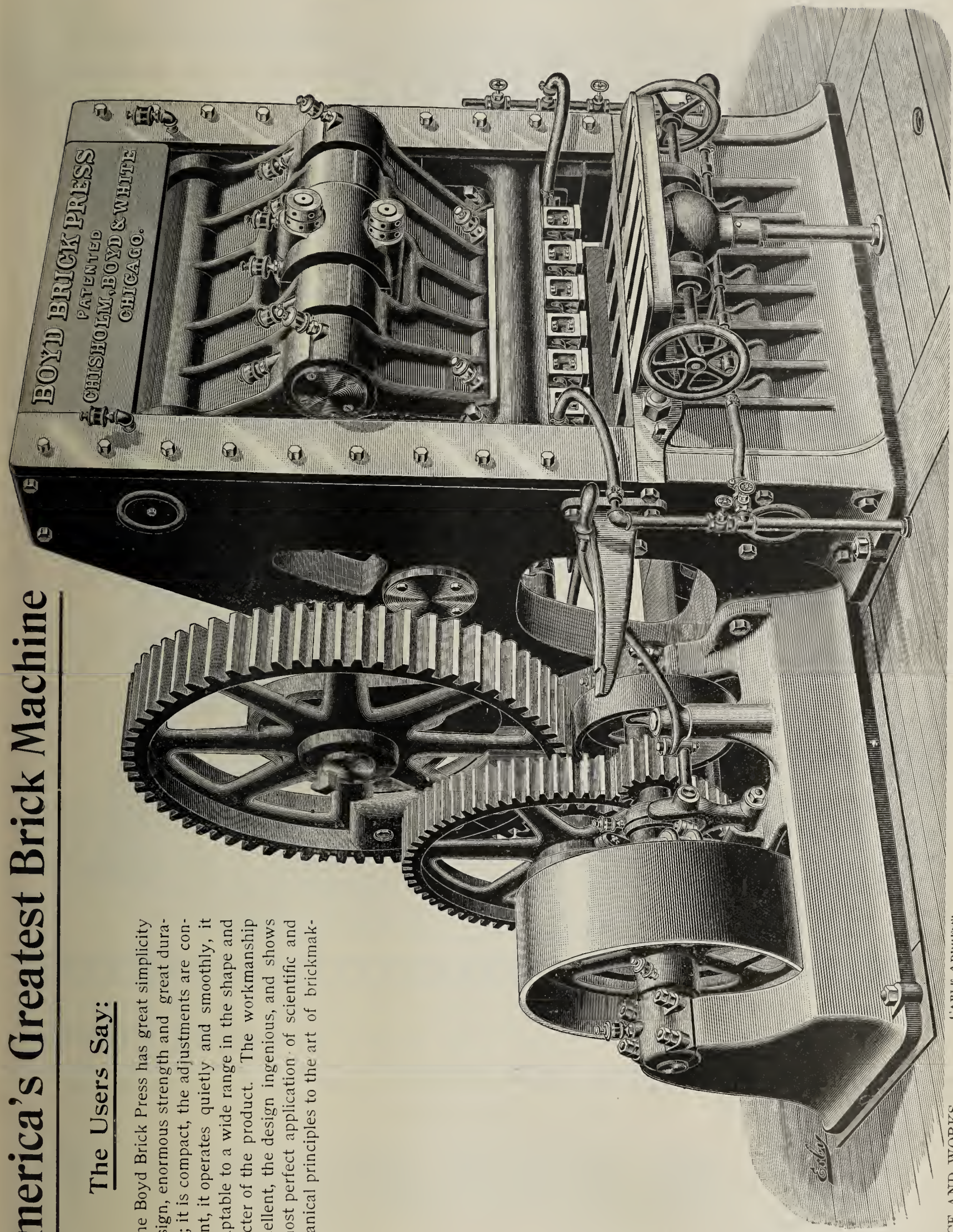
CABLE ADDRESS:
"CHISHOLM, CHICAGO,"
A. B. C. CODE USED.

CHICAGO, U. S. A.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

Clay=Working Machinery.

The
Simpson
Brick Press,

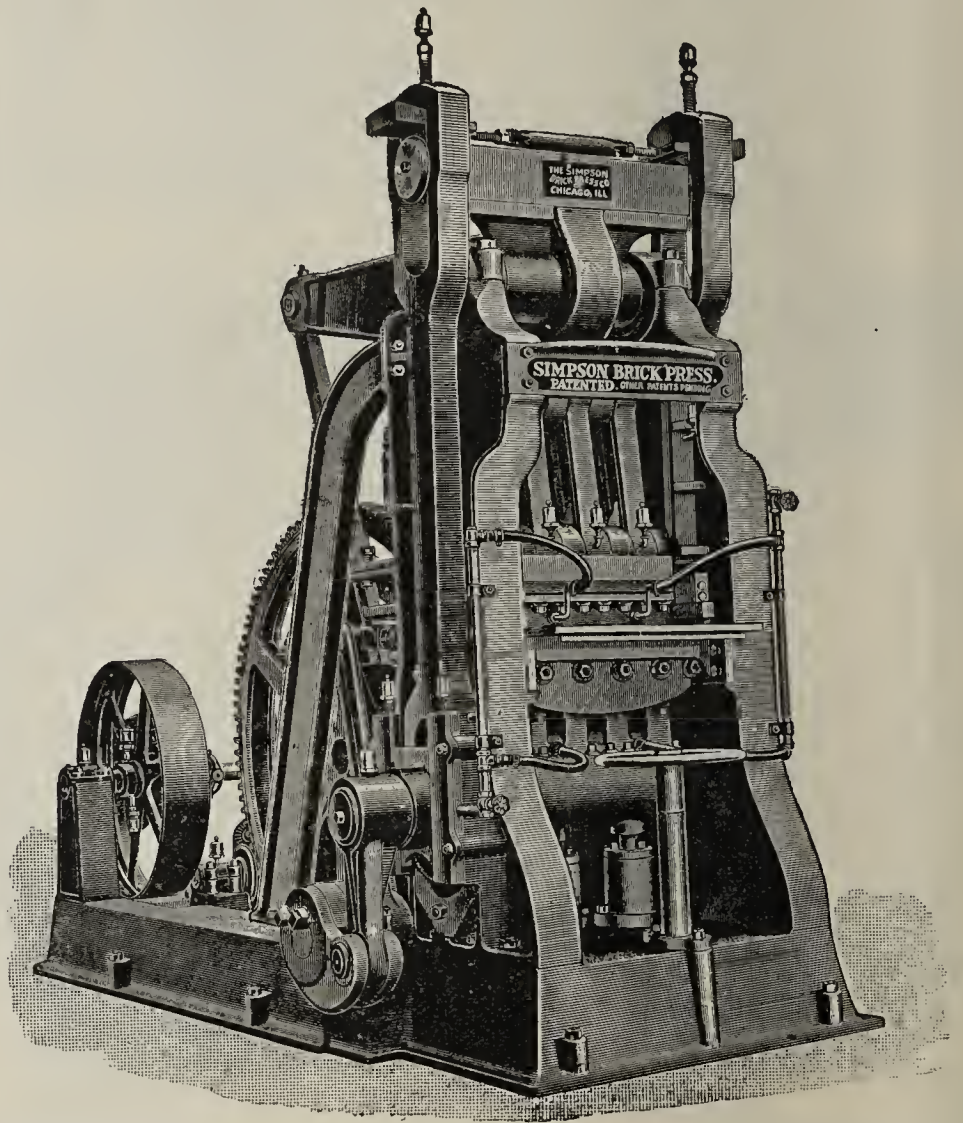
THE
WORLD'S
STANDARD.

.....

Used by all successful
brickyards throughout the
United States and Canada.

We manufacture a complete
line of Clayworking
machinery.

Write for catalogue.



Do not experiment. Invest your money in a **SURE THING.**
Complete plants constructed and guaranteed.

THE SIMPSON BRICK PRESS CO.,

Agents for Canada:

WATEROUS ENGINE WORKS CO.,
BRANTFORD, ONTARIO.

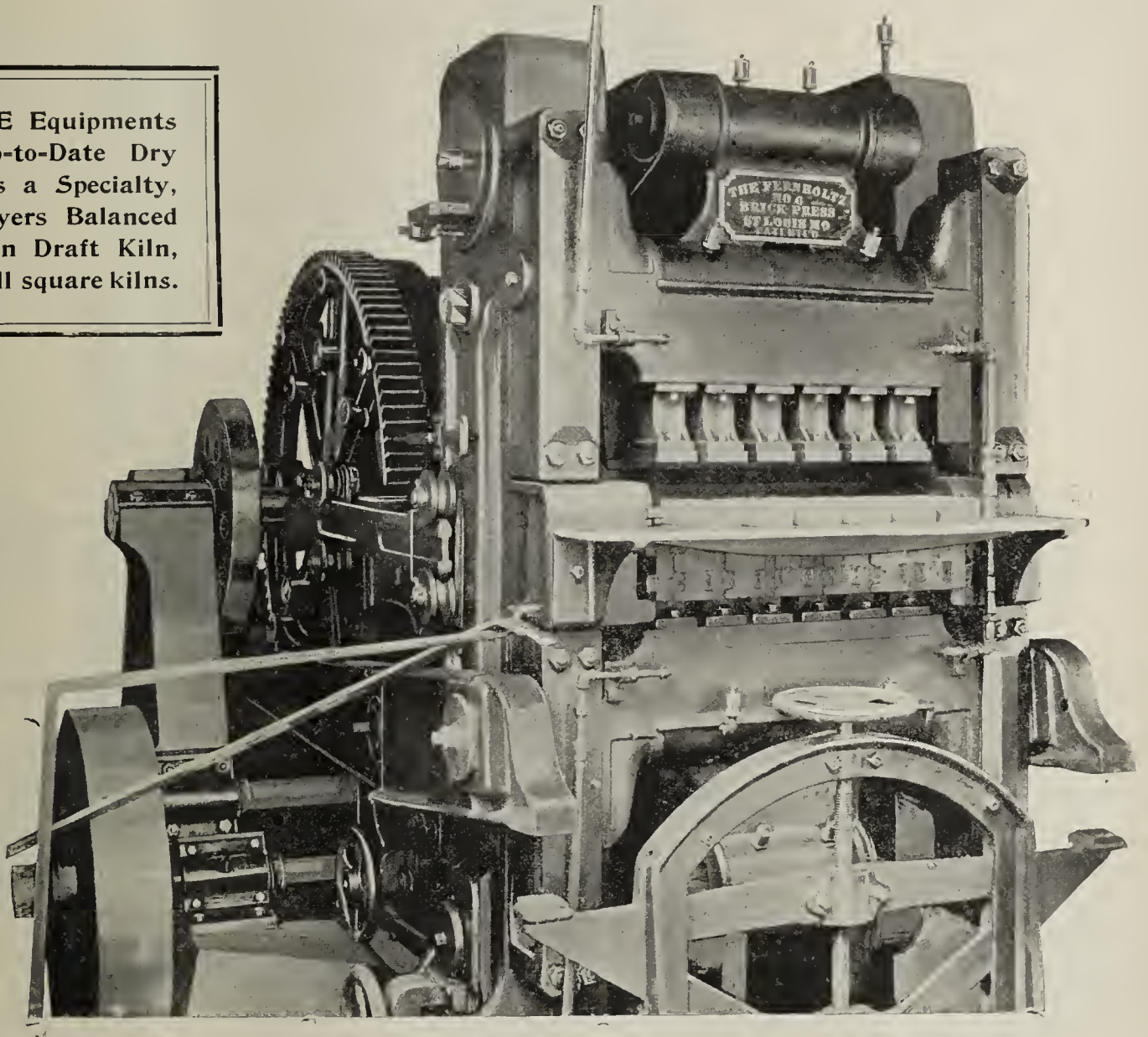
Manufacturers and Engineers,

Chamber of Commerce, Chicago.

The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMPLETE Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

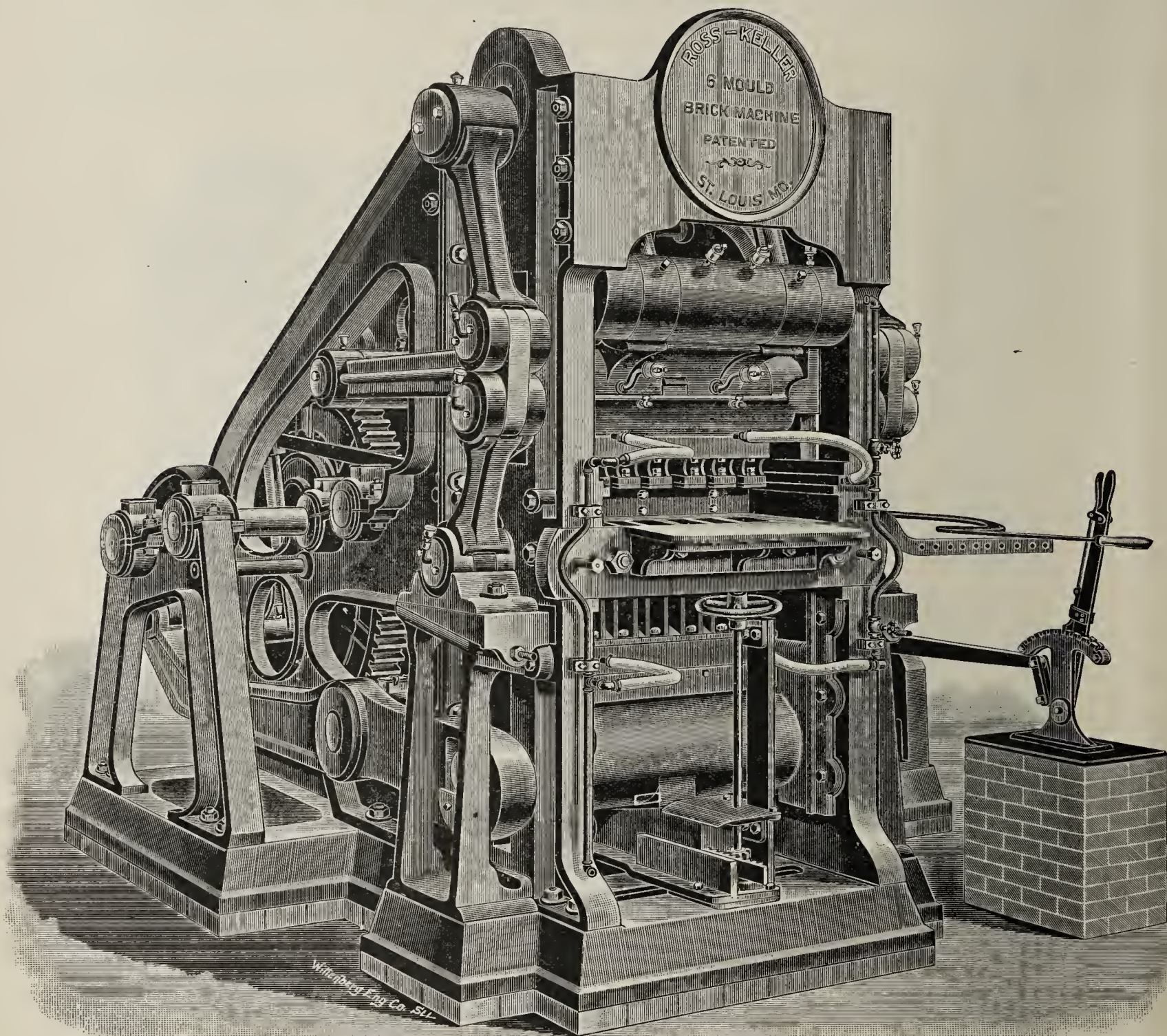
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

ST. LOUIS, MO., U. S. A.

"A Clay Pulverizer of Wonderful Capacity."

SO SAY ALL WHO HAVE USED IT.

QUINCY PRESS BRICK COMPANY,

Quincy, Ills., Jan. 20, 1897.

Green Carwheel Manf. Co., St. Louis.

Gentlemen:--In reply to yours of yesterday, will say, that we have used the Williams Mill during the season of 1896, and think it is the best piece of machinery made for the purpose. We would not part with our machine for several thousand dollars, if we could not get another of the same kind.

It has done our work to perfection, and the wear on it is so small that it cannot be taken into consideration. We have not lost one minute of time on account of the Mill.

We have used other pulverizers, neither of which had the capacity of Williams's, and have lost many hours and days in repairing and remodeling them for our purpose.

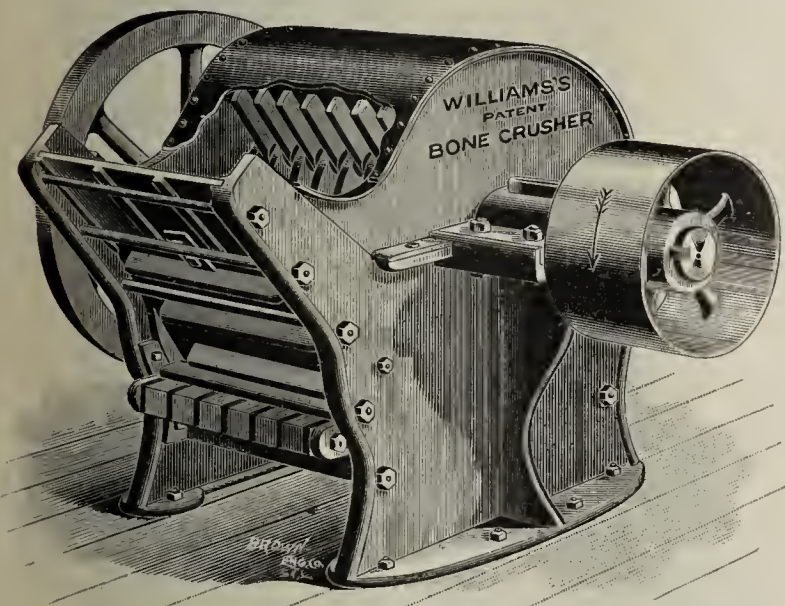
The Mill excels all others, and we have just that confidence in Mr. Williams and the machine that we believe it will do anything he says it will do.

Yours very respectfully,

H. W. GERKE, Manager.

We can send you many more like this.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER



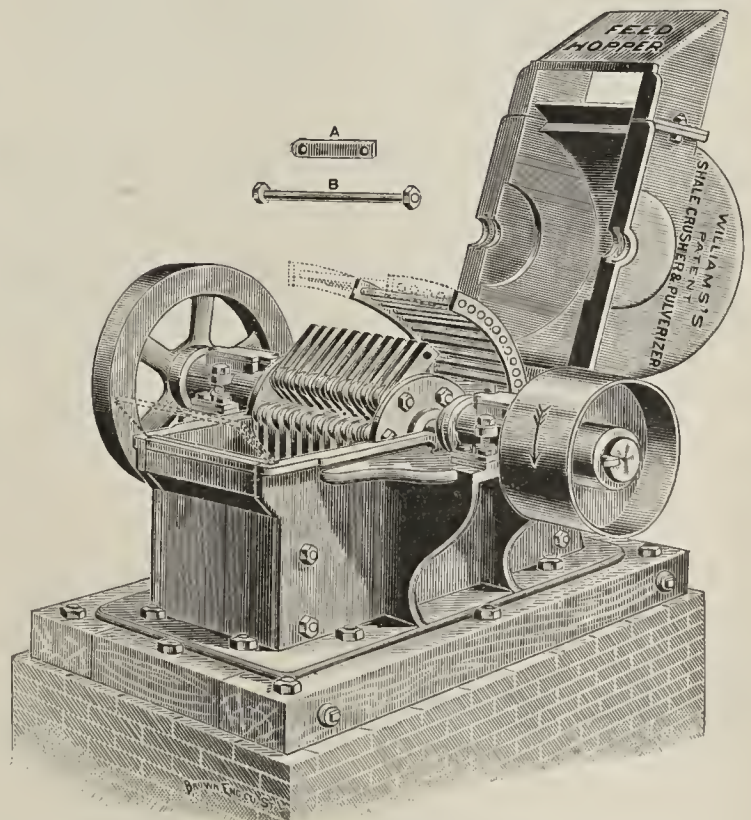
Williams's Shale Breaker.

THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

MILTON F. WILLIAMS & CO.,

2705 North Broadway, - - St. Louis, Mo.



Williams's Shale and Clay Pulverizer.

With Clay Steamer Attached.

Columbia Brick Press.

All working parts are made of Steel.

The pressure is exerted from both top and bottom; consequently there is no lateral strain on the machine.

The pressure is absolutely equal on top and bottom of brick.

A brick with granulation cannot be made on this machine.

The liners on mould can be taken out and replaced in five minutes, without removing any other part of the machine.

Any part of the gearing can be removed without taking machine apart.

The mould box can be taken out in a few minutes, without disturbing the other parts of machine.

The "COLUMBIA" presses clay or shale as dry as a hydraulic press, or so damp as to approximate a stiff mud brick, so that the range of products is from building brick to pavers. No other press does such a variety of work.

The "COLUMBIA" is the only brick press on the market that meets ALL the needs of a brick plant.

For circulars and prices, address

H. B. HILGEMAN,

General Agent "COLUMBIA Brick Press,
... and "COLUMBIA" Mould,

306 Oriel Building, ST. LOUIS, MO.

Terrazo Cement Tiles.

Complete Plants furnished for making the celebrated "TERRAZO" Tiles. Used to the exclusion of all other tiles in all floors, halls, etc., of the following among hundreds of structures in Germany:

JOHANNIS CHURCH, ROYAL AGRICULTURAL COURT, ROYAL DEPARTMENT OF THE INTERIOR, DRESDEN; GERMANIA PALACE, BERLIN AND ANHALT RAILROAD DEPOT, IMPERIAL ART AND MECHANICAL MUSEUM, ROYAL MILITARY ACADEMY, BERLIN; IMPERIAL POST OFFICES, DRESDEN, BERLIN AND
..... LEIPSIG.....

Terrazo Tiles, any color, design or size. For circulars, estimates, etc. Address

H. B. HILGEMAN,

General Agent of THEO. WELGE, for the sale of Dr. BERNHARDI SOHN, G. E. DRAENERT, GERMANY, Machinery and Processes for making TERRAZO CEMENT TILES.

306 Oriel Building, ST. LOUIS, MO.

THE ANDRUS DOUBLE PRESSURE 4-MOLD BRICK PRESS.

Produces the finest pressed brick from dry or semi-dry clay at less cost than common brick by any other process. This press is the **Simplest** and the **Strongest** press on the market, and has given **universal satisfaction** to purchasers. We guarantee it against breakage for **5 years**.

Send for descriptive catalogue.

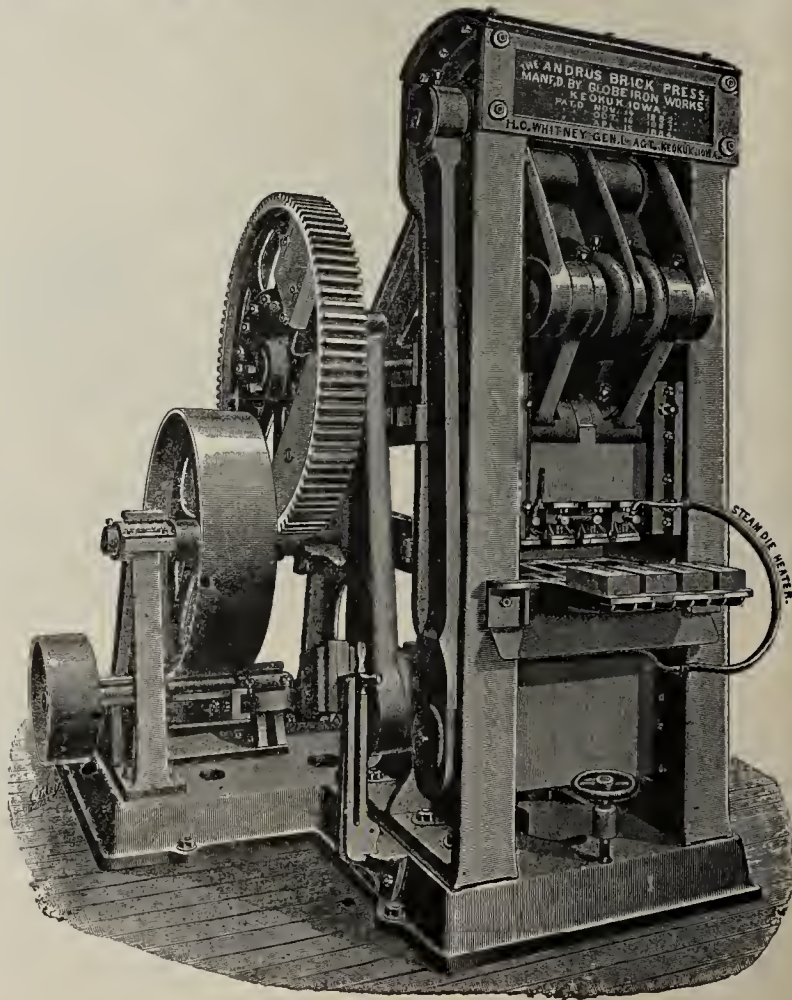
Address, _____

H. O. Whitney,

General Agent,

GEN. OFFICE AND
FACTORY.....
KEOKUK, IOWA.

KEOKUK, IOWA.

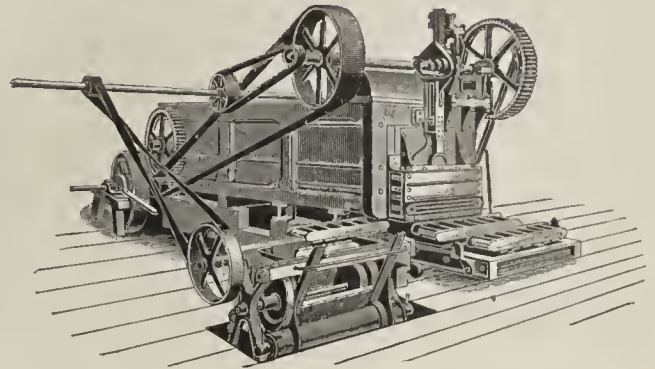
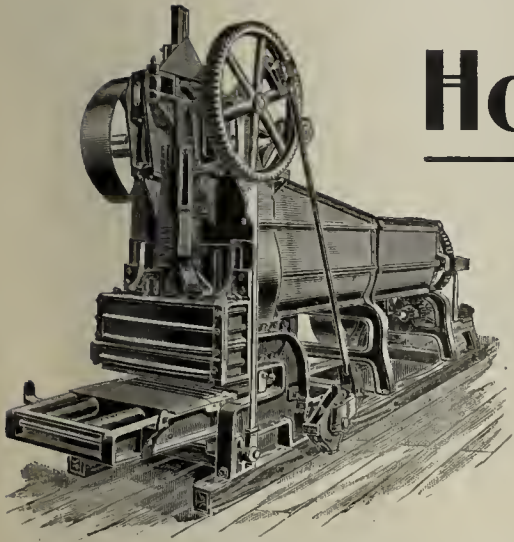


We Have Anything You Want.

.....

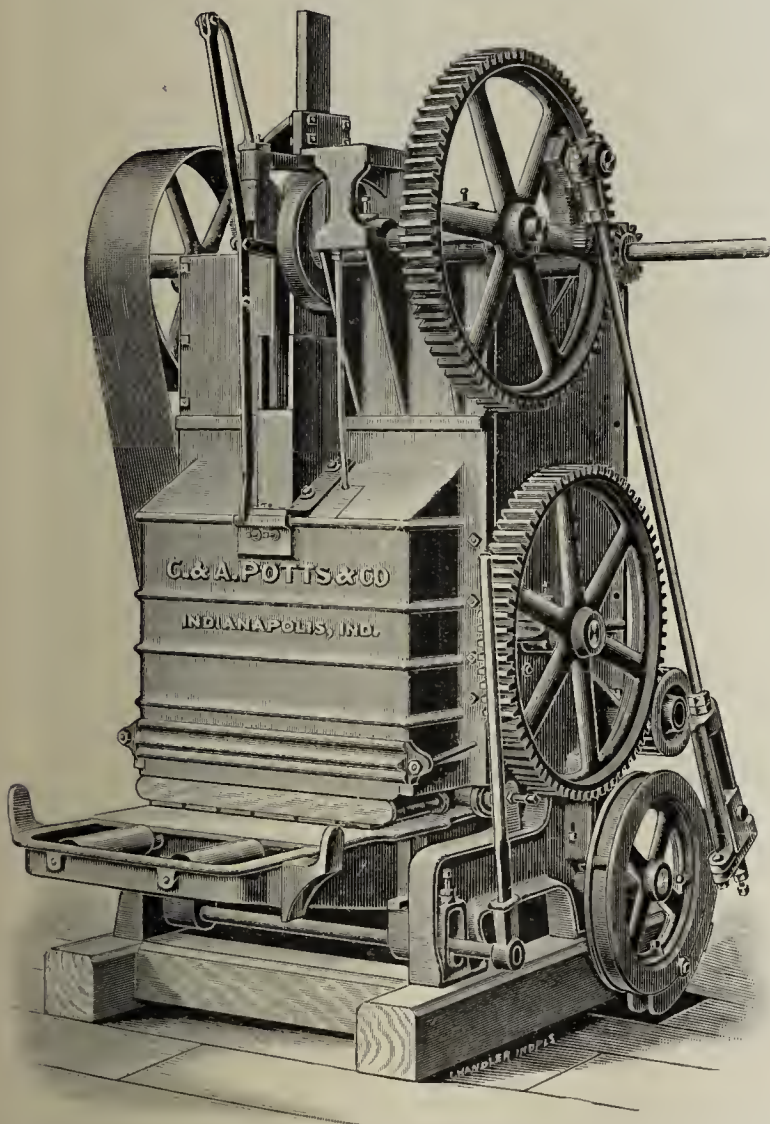
Horizontal Stock

Brick Machines,



EITHER ALL IRON OR WOOD PUG MILLS.

The largest, heaviest and strongest Brick Machines made. We defy competitors to show as well and strongly built machinery. They have no equal for Quality and Quantity.

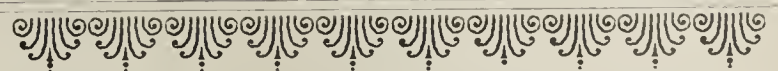


Our New ...

VERTICAL MACHINE

Is entirely different from all others of this class. The press is entirely inside of machine, it has no Vertical shaft is positive in filling the press box and moulds.

WE NEVER FOLLOW,
BUT ALWAYS LEAD.



Write for full Particulars to

C. & A. POTTS & CO., 420 W. Washington St. **INDIANAPOLIS, IND.**

THE N. B. M. A.

While in session at Buffalo discussed the problem of drying thoroughly and with more than usual earnestness, thus emphasizing the fact that more attention is being paid to the subject than formerly.

While there was, naturally, some diversity of thought as to methods, the consensus of opinion was that a Modern Drier is an important factor, and an absolute requisite in the operation of a MONEY-MAKING brick plant.

The STANDARD IMPROVED BRICK AND TILE DRIER

Is the acknowledged LEADER of Modern Driers. It is not an untried or doubtful experiment, but a recorded success, as the letter given below, from an experienced brickmaker, testifies:



The Standard Dry Kiln Co., Indianapolis, Ind.

Tip Top, Va., December 7, 1896.

Gentlemen—Replying to your favor of the 3d inst., would say that the Drier you erected for us last winter has been, and is doing splendid work, and not giving us any trouble whatever.

After twenty years' practical experience as a brick manufacturer, using several different kinds of Driers, I must say that yours is the most rapid and the safest I have ever had anything to do with.

Before we put in your Drier we could not dry more than one million brick the whole season, and then we set them before they were fit to be set. It took us eight days and nights to burn a kiln of 186,000, and now we can burn the same amount in five days and nights and have much better brick. We use a bastard fire clay and ochre, half and half; the brick are dried BONE DRY and without a crack.

You are at liberty to refer to us.

Very truly yours,

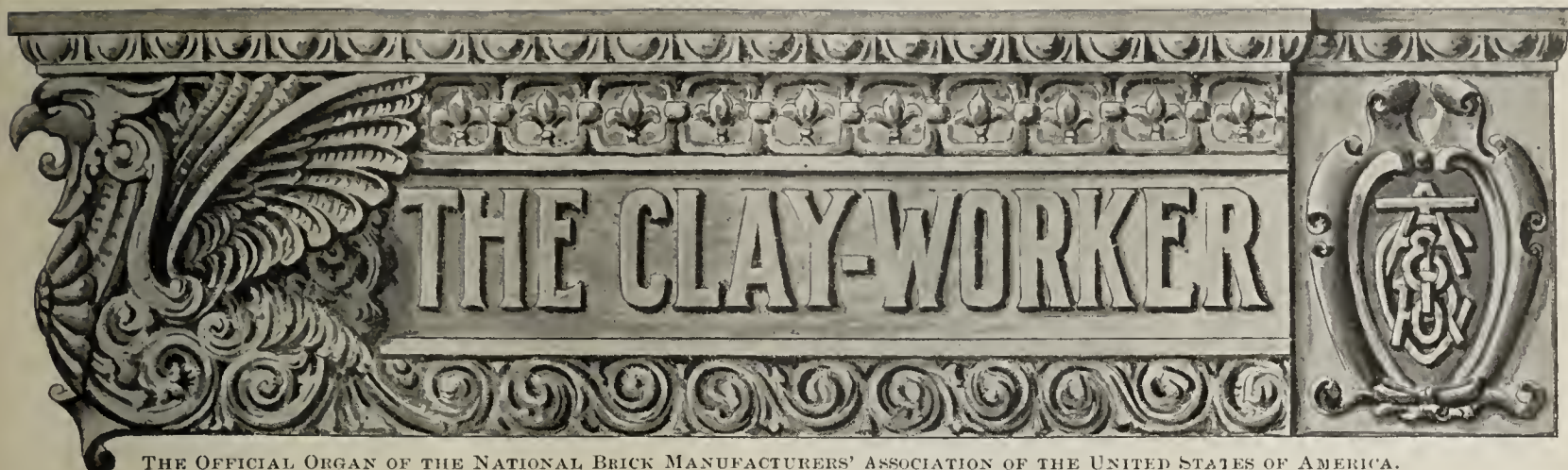
GEO. SHAFER, Supt.

Radford Brick Co.

OUR NEW CATALOGUE No. 35

Just out, contains a great many indorsements fully as emphatic as the above. A perusal of them will satisfy you, we believe, that every claim made for the STANDARD DRIER is verified by actual work. It also illustrates and describes our Equipment, including our new Steam-Saving Appliance, and will prove profitable reading. ARE YOU INTERESTED? MAY WE SEND YOU A COPY?

If You Want the Best Drier for the Least Money Don't Fail to Consult Us before Buying
The Standard Dry Kiln Co., 186 South Meridian St.,
INDIANAPOLIS, IND.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVII.

INDIANAPOLIS, IND., MARCH, 1897.

No.

Written for the CLAY-WORKER.

TERRA COTTA IN PHILADELPHIA ARCHITECTURE.

BY W. P. LOCKINGTON.

IN COMPARISON, it may be said that more money has been spent on terra cotta details of the workingmen's homes of Philadelphia than of the lauded four hundred.

Efforts have been made by our architects to persuade its use in the erection of some of our more extravagant residences, but their clients are as proverbially cautious as the canny Scotchman in London, and will not be persuaded that it will last one century or fifty, unless they can live to see it. They seem to regard it as being a sort of architectural passementerie, not strong enough to resist the pressure of time and weather, and too likely to change like a fashion plate, the result being that after the knight of the T square has taken unusual pains to make, or have made, designs that would so cheerfully relieve his operation of the severity of the bonded courses of his brick work, he is forced to forego the proposed innovation, and fall back, to please his clients, on the reliefs in Indiana limestone or English red, these prevailing. There is, in my humble opinion, a great field for terra cotta, and the men who control its introduction, whether in this city or any other, should look to it that their material, being in the field already as an accepted factor, with all other building material, should bear some relationship in its disposition to meet with the requirements of price. Figures speak very loudly, and during the past twelve months I learn, somewhat with regret, that our men, while having both the inclination and opportunity to use terra cotta reliefs in two or three important operations, have been wholly deterred by the fact that the figures given merged one-third higher than those for good cut stone work.

From the first small sum expended in terra cotta ten years ago we have emerged into the thousands, \$4,000 being expended for terra cotta alone in the facade of a residence lately erected at 2203 Walnut street by J. M. Huston, architect, our reproduction serving well to show the relationship of brick and terra cotta in a better class residence.

Surely the devotion and untiring efforts made by Marcus Spring in New York twenty-six years ago to introduce this semi-vitreous material to an unsympathetic audience ought now to wave over his head an atmosphere of pleasure and happiness in the realization of what then seemed a day dream.

And while these are mere examples, they serve their purpose of showing the onward and rapid progress made in terra cotta. Ten years ago \$250 expended in a panel in terra cotta was regarded skeptically by the owner of a residence as a simple conceit of the architect, a vagary, in fact, to which he consented rather to please the architect than as a personal desire.

But for the powerful influence exercised by that gracious chevalier, George B. Post, in utilizing this soft compound in reliefs on such buildings as the Brooklyn Historical Society, the Produce and Cotton Exchange and the famous Montauk Clubhouse, this material might still be in its infancy. But no; its charm has been recognized, its good qualities tested, and that material which in the hands of the Assyrian and Egyptian

played a minor part in the hand utensils and interior work of the smaller houses now holds a place which marks it at once as one of the strongest competitors against the world's own material—stone.

How often has it been said, "America has no architecture!" But as the Gothic grew from the people, so may it yet prove, in centuries to come, that "American architecture" may find a record and title among the synonyms of the past in the artistic use and design of a material dug from our own ground, designed and molded by the hands of our citizens, amalgamating with the well-

tempered brick, that is another native product and the handwork of our laborers. This means development and advancement, two of the strongest weapons to the world's recognition. From the Assyrians sprang the source of an industry that today gives American buildings a richness in ornamentation pleasing to the eye, and surely splendid resisting qualities against fire and our climatic changes and conditions.

What more can be asked of a material? Yet mutely, in contradiction, it surrenders itself to the easy persuasion of man's skill, saying: "Mold me into whatsoever form thou wilt." And this is the factor that may give to America the



ONE OF FOUR CAPITALS ON CAMDEN BANK.
F. M. Day, Architect.

individual right to a new epoch in architecture.

Our larger institutions are now accentuated in ornamental details. Its almost extravagant use in the mammoth buildings of the Reading terminal found all-important followers in the massive panels of the Pennsylvania Railroad Depot at Broad street, the huge store buildings at Tenth and Market and the Harrison Building at Fifteenth and Market, and now marking the completion of the new Horticultural Hall on Broad street. We have a judicious treatment and an expenditure of \$15,000 in reliefs and details that do justice both to the architect, Frank Miles Day, and Stephens & Co., whose work in general was treated in the first series. Terra cotta firms to-day realize the importance of having men who are trained modelers, and even sculptors, to express and impart to this soft, coy vein of Mother Earth the dignity of life and age in all phases and the soft, rounded lines of youth.

The female figures now interpolating the many pieces of detail no longer offend the sensitive with the vulgar and voluptuous lines of the fish woman in scanty drapings. The figures adorning our institutions are studies, rare, and full of a subtle delicacy in form and expression, quiescent in the intellectual qualities, and bearing a charming interpretation to the position designated, be it allegorical, biblical or commercial.

Cherubs and Cupids, that hitherto have borne the figures of men, have transcended into the sphere and form allotted to them by nature, and the mammoth exaggeration in arms, legs and torso is a thing of the uncultivated past. Cherubs in shape, cherubs in expression, are now born of four parts clay and one grit, that may with all truth be termed fac-simile of the mother's first-born.

In displacing stone details, who shall say nay to the fact that terra cotta, in its longevity, may not outlast stone work? Time alone can tell, and in the delicacy of the detail much may be said in favor of the latter.

Here we have a pleasant conceit in the form of a shield used in the facade of H. K. Cummings's house in Germantown. These are at once reminders of the patriotism and pride gradually assuming sway in the hearts of our citizens to place unostentatiously a symbol of their growth and record of their living before the public eye.

To Architect J. M. Hinton, previously mentioned, a pleasurable license has been given in the choice of material necessary in the erection of the handsome building now being constructed for the convenience of that ever-growing body, the Presbyterian Board of Publication, and which will be designated as the Witherspoon Building. With a front of 75 feet and a depth of 230 feet, flanking Walnut, Juniper and Samson streets, this memorial will stand, with its eleven stories, 168 feet from the base to the roof, a monument of brick and terra cotta.

It has been left to the discretion of this young but rising architect to adequately express how far terra cotta may be used in ornament and detail to relieve the otherwise facial severity of plain brick and heavy steel construction. With him

the sense of delicacy and soul of refinement were two important factors following in the footsteps of good construction. The creation of the figure work and ecclesiastical and biblical themes have been well thought out, and, in the hands of Messrs. Armstrong and Conkling, molded in form and expression according to the details of the architect.

No parsimonious thought enters into the transaction, since no less than \$70,000 is set aside for terra cotta work, thus proving the magnificent strides foretold in the ability of clay as a potent factor against stone. The color theme is of cream white, and stands out in its handsome reliefs with a soft placidity against the hard red of the buildings facing it.

Ruskin, in his treatment of ornament (ch. xxi), explains "how ornament is to be expressed with reference to the mind; how ornament is to be arranged with reference to the sight." Chapter IV: "The especial condition of true ornament is that it be beautiful in its place and nowhere else, and that it aid the effect of every portion of the building over which it has influence, that it does not, by its richness, make other parts bald, or, by its delicacy, make other parts coarse."

Here, in this instance, color has not to be dominated, since its effect and theme is symphonic. The gray tones lend a warm shadow, and in the light tracery of the string courses the surmounting shields and seals are set well in to give tone and aptness to the richly molded spandrels. The human figure must assuredly be the dominating object as against lighter ornamentation, and when judiciously placed will accentuate and make harmonious a facade that characterizes its purpose and proves a pleasurable sight to the eye.

The accompanying illustration is but a passing glimpse of the wealth of terra cotta details which will make glorious the outward being of this huge building and solve the question of the value of terra cotta work in its freedom, its beauty of molding and its stability, to the entire satisfaction of our army of clayworkers.

DUST IN PORCELAIN POTTERIES.

A DISTINGUISHED sanitarian of Limoges, M. Detroye, has recently published a valuable work, in which are embodied the results of his long and careful researches on the subject of the dusts of the porcelain potteries. These studies have not only reference to the toxic dust in the working rooms of the decalcomania printers, but he particularly investi-



A TERRA COTTA COLUMN. Executed by Stephens & Co.

ORNAMENTAL FEATURE, H. K. Cumming's Residence.

gates the action upon the human organism, upon the respiratory and digestive organs, of the clouds of irritating dust, amid which, sometimes, the workmen are laboring in all stages of the manufacture, from the grinding of the raw materials until they finally reach the shipping room. As M. Detroye forcibly

puts it: "The dust of the workshop is incontestibly the greatest danger the workman encounters. If it does not strike him down as with brute force, it lies in wait for him, like a cunning beast for its prey, and filters slowly but surely into the vital organs—the lungs, stomach, intestines, etc.—where it produces irremediable disorders. Then appears the long succession of chronic maladies of the respiratory and digestive organs (bronchitis, bronchial pneumonia, emphysema, sclerosis, gastro-enteritis, etc.), especially phthisis, the germs of which find unguarded entrance into the organism through the mediumship of dust."

—Protecting Apparatus.—

In this connection the *Moniteur de la Ceramique* says that Dr. Guernonprez recently made the matter of the apparatus to be used for protecting the men from unwholesome dust the subject of a communication to the Industrial Society of the North of France. He said that while in certain industries it is absolutely necessary to protect the workmen from dust, this protection must be accomplished without impeding or inconveniencing the man it is intended to protect. He then alluded to the various devices proposed to accomplish this end. Sometimes little discs placed between the teeth to force respiration through the nose, that member being provided by nature with means to purify the air passing through it (even in the case of biologic dust), when the dust is not excessive; sometimes the

THE VALUE OF CLAY PRODUCTS.

OHIO IS THE foremost clayworking State in the Union. Its annual product in all branches of this industry reaches a value of \$11,000,000. Next, in the order named, stand Illinois, Pennsylvania, New York, New Jersey and Indiana. The output of these six States more than equals that of all the rest of the country combined. The total for the States reaches a value of nearly \$70,000,000. Ohio soil, aggregating millions of tons, is annually worked up into articles of utility and beauty, from the coarsest clay product to works of art, which find a market in many parts of the world. Although an inviting field of inquiry, the clay interests have only until recently received attention at the hands of the State Bureau of Labor Statistics, and through the courtesy of Hon. W. T. Lewis, Commissioner of this bureau, an Associated Trade and Industrial Press writer has been accorded the courtesy of an examination of the latest compilation of statistics concerning Ohio's clayworking industries.

Under the classification of Architectural Ceramics are included all such products as enter into the construction of buildings, streets, sewers and all other varieties of improvements.

The following extracts relate to the State's brickmaking interests only:



TERRA COTTA IN PHILADELPHIA ARCHITECTURE—Ornament for Horticultural Hall.
Frank Miles Day, Architect.

air is filtered through cotton placed over the respiratory organs. The whole difficulty is to find an apparatus that is comfortable when put over the face. But Dr. Detourbe has solved this difficulty by making a sort of frame, which, though light, fits closely to the face in such a way as to prevent all entrance of the air except through the cotton filter, which is held in place by light aluminium bands. The workmen who have used this apparatus find it very satisfactory.

In this connection, also, Dr. Guernonprez presented to the Society a very simple apparatus, designed by M. Carron, to protect workmen from the intense heat and the flames of furnaces. The original feature of this device is that it is supported from the top of the head, and so allows a large circulation of air between the shield and the face. This device is especially interesting to glassblowers, kiln men and iron puddlers.

CLAY INSULATION.

Not the least among the outlets for the products of burned clay is its use for insulating purposes. Some of the great conduits for the wires from the electric plants at Niagara are of brick and other forms of burned clay. In our own and other cities clay conduits for the electric and telephone wires are the only approved material, and large quantities are used for this purpose. Even in dwelling houses where joists and partitions must be perforated by the passage of wires the openings are lined in small sections of burned clay insulations.

—Brick.—

In the manufacture of brick, including all varieties, Ohio ranks fourth, the position of the principal clayworking States being as follows: Pennsylvania, value of product, \$6,300,000; Illinois, \$5,300,000; New York, \$4,400,000; Ohio, \$4,000,000. In some of the items which go to make up the total, as will be seen in the further consideration of the subject, Ohio is the largest producer.

—Common Brick.—

The ordinary soft red brick is the most extensively used of all clay products. As common brick is manufactured for local consumption, the States, in value of output, rank about in order of their population. The same rule holds good, ordinarily, with respect to the various localities within a State, the greatest amount of brick being made in the vicinity of the larger cities. Clays suitable for this class of brick are found everywhere in Ohio, and little skill is employed in manufacturing. Consequently there is no element except greatest convenience to the largest centers of consumption that would encourage the making of common brick in any particular locality. A year's product for Ohio is estimated at 3,000,000,000 brick. For reasons heretofore stated—the wide distribution of the industry and the great number of small concerns which go to make up the aggregate—it is impossible to give, with any degree of accuracy, the total value of the product, the capital invested and

the number of persons to whom employment is given. As an example of how these items run proportionately, the following figures are given, taken from the information furnished to the department by fifty-six concerns: Capital invested, \$495,150; value of output, \$399,067; amount paid in wages, \$173,654.

—Paving Brick.—

Ohio is the home of paving brick, the four States with which comparison has already been made ranking as follows in value of output for 1894: Ohio, \$928,000; Illinois, \$842,000; Pennsylvania, \$521,000; New York, \$137,000. The manufacture of street paving brick, though only about ten years old, has already grown to be one of the most important branches of clay-



A MODERN PHILADELPHIA RESIDENCE. Page 237.

working, and its future appears to be especially promising. Previous to 1885 the experiment of paving public thoroughfares with brick had been tried in a small way, but with satisfactory results, in West Virginia, the material for the purpose having been made in that State. In the year mentioned the Townsend Company, of Zanesville, O., added the making of paving brick to their business, claiming to be the first in the State to embark in the enterprise. As the cheapest means of reclaiming city streets from what, during a portion of the year, was a muddy and filthy condition, brick paving met with great favor. The spirit of improvement which sprang up everywhere created an enormous demand, and other manufacturers were not slow in shaping their business to meet the same. In addition to the large number of pressed and common-brick makers who coupled the manufacture of paving brick to

their regular lines, or entirely substituted the former for the latter, the volume of business served as an inducement to outside capital, and large, specially equipped plants were built for the purpose. The result was a great improvement in the quality of the product over that which had at first been turned out, and a great cheapening in price. Subjected to heavy traffic and the action of the weather for a few years, much of the earlier pavement that had been put down proved to be practically worthless, and caused a better understanding among the manufacturers as to the qualities necessary in a durable street. The highly vitrified paving brick at present manufactured in Ohio is more indestructible than stone, and is apparently proof against the severest wear to which it may be subjected. The clays found in various localities throughout the State are especially adapted to this class of product.

A NEW KIND OF INSULATING BRICK, patented in France by Mm. Samuel Pollak and Norbert Zwillinger, reported in *Moniteur de la Ceramique*, Nov. 15, 1896.

The object of this invention is the manufacture and use of insulating bricks specially designed to replace those which are now tarred or coated with bituminous or other insulating paint, and also the asphalt blocks now in use. They are designed, also, for use in the entire construction of buildings exposed to the action of water, acids or alkalis, or to steam and acid and alkali vapors. The inventors propose to treat ordinary bricks (handling them on suitable endless chain or other carriers) just as they come from the kiln, and while yet they are as hot as the process permits, to a bath of melted tar, asphalt, paraffin, rosin, or a bath of a mixture of these solutions. This method of impregnating the bricks with the insulating solution presents peculiar advantages from the fact that the bricks, coming direct from the kiln, are uniformly heated through and through, and their pores are, so to speak, entirely free from air, and in consequence the bricks are in an especially favorable condition for complete impregnation by the solution. When it is attempted to carry out this process after the bricks are once cooled it is found to be more expensive, while the results are much less satisfactory. When the bricks are cooled after treatment they may be used at once in buildings, in combination with either Portland cement, or hydraulic mortar with tar or asphalt.

FOREIGN NEWS NOTES.

—The Brick and Tile Industry in Tunis.—

Official reports show that there are both native and European factories in operation in this French colony, although the latter, while less numerous than the former, are the more important. The Europeans, however, make only common and hollow bricks, but of all sorts and sizes. The roofing and gutter tiles, drain and paving tiles, are brought from Europe. The machinery is actuated both by steam and by man power, but the quality of the products is good and daily improving. The annual product is valued at 125,000 francs (\$25,000), while the imports reach 270,693 francs.

—The Ceramic Industry in Greece.—

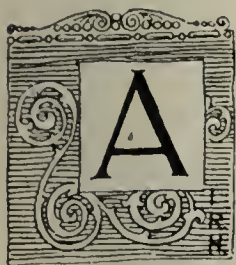
There is but one glass factory in Greece—that of M. Argiropoulos, located in the Piraeus, and making common table ware, bottles, lamp chimneys, etc. The sand used is mined at Fontainebleau, and shipped from Rouen, France. The works employ one hundred men. The only pottery of importance is that of Messrs. Gasparis & Assimakis. The clay used is brought from Syra and others of the Cyclades.

—The Porcelain Industry at Limoges.—

The number of furnaces in operation in Limoges during October was 268, eighteen of which used wood and 250 coal for fuel. This is an increase of twenty-seven furnaces over October, 1895.

Written for the CLAY-WORKER.

IN DEUTSCHLAND. No. 12.



AGAIN WE RETURNED to Germany's classic river, the Rhine, to follow its northward course. As a relief from the tiresome railway passage, we boarded one of the comfortable river steamers at Mayence, intending to make Bonn our landing place. Truly, the Germans may be justly proud of their river; it cannot be compared with any of our water courses, for its charms are of a peculiar type. Its scenic beauty is inferior to that of the Hudson; not as bold and not as natural. However, there is an air of quiet beauty about the Rhine which must be experienced to be appreciated. Its clear, green water, its vine-clad hills, its occasional rocky banks, its ancient towns, cathedrals and weather-beaten, half-ruined castles, unite to produce this effect. We were favored with fine weather, so that the line of historic places along the river were passed in all their glory. At last the Drachenfels, the last of the chain of low mountains forming the Rhine valley, and also one of the most picturesque ones, was reached and soon we arrived at Bonn. There we again took a boat to convey us to Oberdollendorf, a small town, some miles up stream, near the Drachenfels, where one of the most prominent clay works of the Rhine district is located, the Wiel Brick Works. From the steamboat landing we had a delightful walk to the factory, in full view of the bold "Dragon's Rock," along a splendid highway shaded by apple and pear trees, which were loaded with fruit. This custom of planting fruit trees along the roads is a beautiful one, worthy of imitation. The macadamized road, like almost all other German highways, was a road par excellence, as perfect as it is possible for a country road to be. Arrived at Oberdollendorf, we were cordially received by Mr. Schramm, the Manager of the brick works, who also kindly conducted us through the entire factory. The concern, besides front and shape brick, manufactures glazed brick, floor tiles and terra cotta. They work two clays, the one a buff, the other a red burning material. The former is very difficult to work, and requires a high temperature in burning. Owing to the nature of the clays three pairs of roller crushers are in operation, through which the clays pass successively; first, a corrugated roller crusher; second, smooth cylindrical; third, smooth conical rolls.

Three auger machines are used, one for plain brick, one for



THE WIEL FACE-BRICK WORKS. Ober-dollendorf on the Rhine. Left Wing.

face and one for glazed brick. The latter machine also presses the floor tile blanks. The brick to be glazed are not repressed, but are recut, thus removing the treads of clay clinging to the edges after the first cut; of course, special care is taken in their handling. The floor tiles are pressed on friction screw presses. Outside of the usual drier on top of the kiln, shed driers were

constructed for use during the summer season. All the brick are transported by tram cars. In taking the wares down from the drying rooms the loaded cars are passed on to a platform elevator and let down to the kiln level, where they are pushed into the chambers.

Two continuous kilns are in operation, a Hoffmann and a Dannenberg kiln, each having fourteen chambers and being provided with Haedrich fire walls. Splendid results are obtained, very clear colors and satisfactory glazes, such as could not be had in continuous kilns not provided with fire walls. However, the setting is rendered very slow and tedious by this arrangement, and the repairs amount to a good deal per year, so that Mr. Schramm is looking up a substitute for these walls.



THE WIEL BRICK WORKS. Rear View.

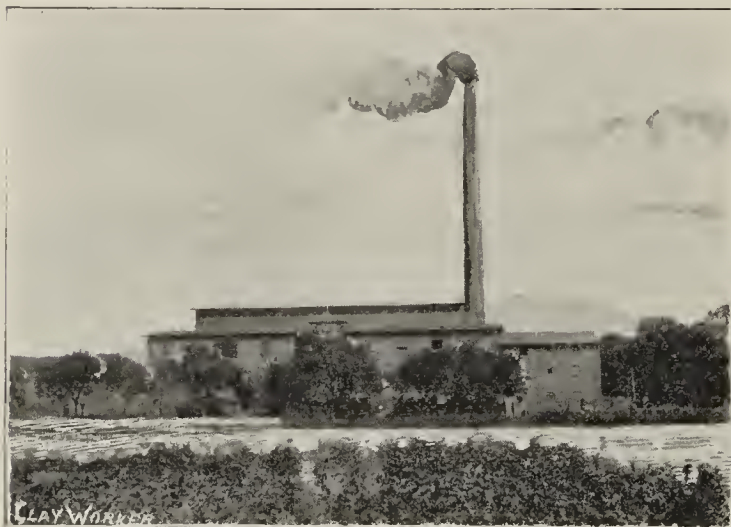
Some very pretty glazes were noticed, especially a very clear buff, furnished by Katz & Co., Mannheim. White and delicate shades of glazed brick are burnt in muffled kilns constructed by Mr. Schramm himself. The glazes are ground in porcelain-lined ball mills.

The buff brick, requiring a high temperature, consume the most coal in their burning—550 pounds per thousand. In the burning about 2 per cent. of waste is obtained, warped, broken and discolored brick. For the storing of the brick spacious stock sheds are provided, while also many thousand brick are piled up in the yard. Most of the shipments are made by boats on the Rhine, the firm having a narrow-gauge track running to the landing place. This factory is in condition to turn out all the materials for a building, excepting roofing tiles only—brick of all kinds, shapes and colors, glazed brick, floor tiles and terra cotta. Their shops for turning out the latter are ample for doing all ordinary jobs. The designing and drawing rooms which are connected with the establishment deserve special mention, being models of their kind, a circumstance which is not surprising, considering the fact that Mr. Schramm is an architect by profession. Judging from the number of building plans on hand and from the activity prevailing about the factory, it seemed as if dull times were not known here. In fact, the Wiel Brick Works stand as a convincing proof of what organization will do, being, as they are, members of an association of front brick manufacturers of two years' standing. Formerly the brick works of this region were competing with each other very bitterly, cutting prices lower and lower, till at last living prices belonged to the past. After these hard experiences the brickmakers made the discovery that by uniting to form an association, with a common office for selling the goods, and distributing the contracts according to fair, common-sense principles, they could maintain fair prices. As it is now, the united concerns are all running and everybody is satisfied.

—The German Earthenware Industry.—

To a clayworker not accustomed to German conditions the most peculiar branch of the clay industry seems to be the manufacture of the ordinary earthenware, the lowest form of pot-

tery, which comprises such articles as cooking vessels, milk pans, flower pots, and even table ware. It is very difficult to classify this kind of clay goods according to the character of the raw materials used, for in some parts of Germany earthenware is made solely of red clays burned at a low temperature and provided with soft lead glazes, while in other districts,



THE WIEL FACE-BRICK WORKS. Right Wing.

though comparatively few, clays resembling our stoneware clays are worked, which are burned at a higher temperature, and have either slip glazes altogether or such compounded with lead oxides. However, the great majority of earthenware goods is manufactured out of red burning clays, which, when burned, are of a very porous nature. The surprising part is that such wares, notwithstanding their imperfect quality and the fact that white ware and stoneware are sold at low prices, find such a comparatively large sale in the rural districts. This, however, seems to be mainly due to the tenacity with which European country people adhere to their old customs. The only points which can be cited in favor of these products are their ability to stand sudden changes of temperature owing to their porosity, which renders them desirable for cooking wares, and their extreme cheapness.

The manufacture of earthenware is carried on not in large establishments, but by independent master potters, having, perhaps, as high as a dozen journeymen and apprentices, this being the way in which the business has been conducted since time immemorial. There is no question but that this branch of pottery is steadily but surely declining, and it will not be many years before it will have become extinct. As it is, prices are so low that the people engaged in the industry barely make a living. However, many of these potters also carry on the manufacture of stove tiles, for the well-known earthenware stoves, and the more enterprising ones produce floor tiles, siding tiles and other interior decorations.

It will, perhaps, not be amiss to consider the lower and higher grades of this ancient trade, the writer having had ample opportunity for studying it in its various aspects. In regard to the raw material it can be said that any plastic clay, free from gravel, coarse grit, iron pyrites and concretionary lime pebbles, may be used. Lime in the finely divided state does not affect the usefulness of the clay for this purpose, as the temperature used in burning is not high enough to develop its fluxing activity. The mining of the clay does not take place in accordance with the rules of economic mining; in fact, the potter simply digs a hole, takes out his clay for the season's use, and then lets the bank cave in or fill up with water. When the next digging period arrives a new opening is made beside the old one and the same thing is repeated. Without question much trouble is often caused to the potter by this careless method, owing to variations in the clay strata, which he would not experience to such a degree if strictly following a certain vein. It is the practice to let the clay weather by exposing it

to the action of the frost throughout an entire winter. These clay banks, having often been worked for centuries, do not offer, as a rule, a very regular appearance. From the clay beds the material is taken to the preparing room, where it is either worked by means of spading and afterwards treading, carefully removing any impurities, such as pebbles and roots, and adding sand or grog, or, as is the case with the more progressive potters, by means of small pug mills. The prepared clay is stored in closed damp rooms, where it "sweats" several months before being used. Preparatory to turning it is wedged; that is, it is repeatedly cut with wires, thrown and kneaded. The wheels are of the most primitive kind, so-called kick wheels, being kept in rotation by foot motion. These appliances simply consist of a vertical iron axle, ending below in a steel point and on top in a tread. The point runs in a suitable bearing, while the wheel head is screwed on to the top. A short distance above the point a large wooden wheel is fastened to the shaft, from 20 to 30 inches in diameter, by means of which the tool is turned. Right below the head a bearing is put up, which keeps the shaft true.

The ordinary shapes turned are generally not of a specially elegant type, but occasionally one meets really graceful forms. Owing to the comparatively weak structure of the ordinary earthenware the walls must be made rather thick, which, of course, causes the goods to appear clumsy and heavy.

Most of the potters being without power, they are, of course, restricted to the wheels referred to above, and cannot employ mechanical wheels; besides, they are prejudiced against the latter. For the same reasons the jolly system of the stoneware and white ware shops is not applied. Of course, there are progressive potters who avail themselves of modern improvements; for instance, we met such a man, who, although making ornamental flower pots and filters only on a moderate scale, has a pug mill, power wheels, and operates the jolly system, using a gas engine for power. Some of the potters develop considerable skill in turning complicated pieces of ware by hand, feats which are never attempted in this country with earthenware.

The turned ware is put on long boards, which are set on racks. No particular arrangements for drying are usually made, the drying racks being constructed wherever most convenient without subjecting the ware to strong draft or extreme temperatures. Often we noticed that the pottery was dried in



DRYING SHED AND BRICK CAR.

the turning rooms, heated by common stoves. When the clay has dried pretty stiff—leather hard, as the Germans say—the articles are either slipped or glazed. Slipped in case of red burning clays, when it is desired to apply colored glazes which do not harmonize with the body, such as blue, green, yellow, etc., and also when the conditions are such that the glaze cannot be applied direct to the body without causing trouble of some sort, cracking or crazing.

In the first case, of course, a light burning slip—covering slip, as it is called—is always made use of, as the color is the principal object, while in the second it is sought to produce a coating which is to act as a medium between body and glaze, conciliating their hostile qualities. It is evident that a slip may be made to perform both offices. Usually a plastic clay



A BRICK SCHOONER ON THE RHINE.

is used which burns the desired color, and whose fluxing inclination lies between that of the body and that of the glaze, so that it is endeavored to obtain a slip which vitrifies to some extent, thus establishing a firm bond between the two opposites. The essential part in preparing a slip is that it must have the same, or approximately the same, shrinkage as the body. The most common way of preparing this slip in the smaller potteries seems to consist of stirring up a clay similar to or the same as the body with water, in barrels, adding to it a potash solution of from 5 to 15 per cent. The liquid containing the fine clay particles is dipped out and used as slip.

Often the light burning slips are colored, especially when colorless glazes are to be applied. In this case the coloring metallic oxides are intimately ground together with the slip. The pottery must not be too dry when slipped or it will soften. The inside surfaces of the ware are coated by pouring the liquid into the vessel and rotating the latter. The outside surfaces are slipped by means of pouring with dippers. At this stage some crude decorations are often attempted by tracing plain or wave lines of different colors around the vessels, using, of course, different slips. These lines, or other decorations, applied in this manner, appear through the glaze, and sometimes produce very pretty effects. Formerly it was one of the main diversions of potters to trace scriptural and other more or less poetic quotations in rude characters around their wares, but this custom seems to have died out. A very pleasing effect is sometimes obtained by scraping away portions of the slip, exposing the body, and thus producing various decorations. In Franconia, where often a large proportion of village populations is engaged in the manufacture of earthenware, so-called painting parties are arranged. At these social gatherings the young journeymen vie with each other in producing the most brilliant color decorations. Very likely the presence of the feminine element adds a powerful incentive to their artistic aspirations.

Now, as soon as the slip has dried sufficiently, the glazing may take place. As has been alluded to before, there may be glazes which do not require an intermediate slip, and where the glaze is applied directly to the body, but most generally a coating is required between the two extremes. The glazes used for earthenware are nearly always lead glazes, low-fusing silicates, which melt at temperatures coinciding with the finishing heat of the ware itself. From what has been said before, it is seen that the glazes are applied to the green ware; only in instances where the material does not permit of this practice is the pottery biscuit burned—that is, burned slightly—before glazing. As a rule, such clays are selected which stand glazing in the green condition, for the prices of this kind of pottery being so extremely low the makers can ill afford to burn the goods twice.

In the relation between body and glaze it is the former which has to be corrected in regard to shrinkage, for the glaze is restricted to a specific composition on account of the low temperatures employed. It cannot be altered without seriously affecting its degree of fusibility, and at the same time its utility for the potter. Hence the body is regulated to suit the glaze by

the addition or subtraction of non-plastic matter or fluxes. The desired result is generally obtained through the addition of sand, grog or lime.

Returning to the glazes, we must divide them into colorless and colored ones. The former are obviously employed where it is desired to show the color of the body or the slip, the latter where these should be hidden. These glazes are lately manufactured on a large scale, so that they can be supplied to potters at a reasonable rate. However, many of them prefer to make their own compositions, which they usually try to keep secret, and which, of course, they imagine superior to others, inasmuch as most of these formulae have been handed down from generation to generation. All ordinary earthenware glazes are lead silicates, more or less basic, and containing, besides the lead, one or more bases. The more lead the glaze contains the easier it fuses and the less durable it is, the more liable to be decomposed by acids of any kind, even the comparatively weak organic acids, acetic and the fatty acids. Formerly, when such glazes were even more basic than they are now, cases of lead poisoning caused by the use of earthenware in the household were not infrequent. However, now, all these glazes contain, besides lead, bases like soda, potash, lime, and somewhat higher temperatures are employed, so that the danger has been almost entirely removed. Many men have endeavored to do away with lead oxide as a flux entirely and substitute in its place alkaline fluxes, but, it seems, without much success, for lead glazes are still used almost universally. The alkaline and alkaline earth silicates require a higher temperature than the lead glazes, are more liable to crack off, do not give such brilliant colors with the metallic oxides, have a duller appearance, and must be fritted—that is, fused together—before being used. These are enough reasons to convince any ordinary earthenware potter of the superiority of his old glaze. Some of the more progressive makers, however, if they have a suitable clay, are trying to use alkaline silicates, especially since men like the late Dr. Seger have solved the problem of low-fusing silicates to some extent by introducing boracic acid into the compositions, thus producing boro-silicates.

The simplest lead glazes for the lowest branch of pottery under discussion consist of lead as an oxide, sometimes as a sulphide, of silica in the form of quartz sand, and of clay, generally the same which is being used for the body. But very seldom are the compositions as simple as this, because nearly every potter adds some ingredients whose specific action he does not understand, but whose influence he believes to be beneficial. As a typical specimen of a glaze of this kind we will quote a glaze composition in actual use to-day, which has been copied from an old book of recipes about a hundred years old, with the permission of the owner, Mr. Karl Baab, an earthenware potter at Weilheim, Upper Bavaria. For a brown lead glaze he uses the following mixture: Eight parts (by weight)

of galena, lead sulphide; three parts of flint; three parts of clay, a red burning kind; one part of braunite, a manganese ore.

It is not our intention to quote recipes, as we consider that a waste of time, but it is intended to show the characteristics of the different glazes. The type quoted needs no further explanation, for it is readily seen that the ratio of bases to the silica is exceedingly large, and hence it must be considered a true lead glaze. There remains yet to give an instance of a glaze where the lead oxide is partially replaced by alkalis and alkaliue earths, and where fritting is required. Such a one is the following: Forty-two parts of litharge (lead oxide), forty parts of quartz sand, eleven parts of commercial potash, five parts of clay, one part of chalk, one part of borax.



PAUL SCHRAMM, Director of the Wietl Brick Works.

This composition requires a higher temperature than the preceding one, but is more durable. Ordinarily the potters frit half of the composition, including the alkalis and part of the sand and lead, by putting the thoroughly mixed ingredients in old seggars and setting those in the kiln with their ware. The fused mass is crushed and ground together with the remaining portion. Some of them, however, have regular furnaces with crucibles where they melt down their frits. In the next paper the grinding, glazing and burning will be described.

THE OHIO Clayworkers Association

18TH ANNUAL CONVENTION.

Morning Session, Friday, Feb. 12, 9:30.

THE OPENING SESSION was called to order by President Bigelow, who introduced to the assembly Hon. E. M. Ayers, President of the Zanesville Board of Trade. Mr. Ayers extended a cordial welcome to the Association, speaking as follows:

WELCOMED TO ZANESVILLE.

Mr. President and Members of the Ohio Brick, Tile and Drainage Association:

As President of the local Board of Trade it affords me pleasure to tender to you the use of this room for the deliberations of your eighteenth annual meeting. It is not large, but I trust it will meet your requirements.

As a citizen of Zanesville I give you a much broader and warmer welcome to our midst, and hope, when you depart, you will have nothing but words of praise for what has been done, and that our shortcomings may be overlooked.

I think it very fitting and proper for an Association of this kind and character to meet in Zanesville. It has been your rule, I know, to hold your sessions in Columbus. It is true that that city is easily reached, and undoubtedly your meetings there afforded a great deal of pleasure and profit. But Zanesville is a clay city, and I think those who have kept in touch with the advancement made in the production of clay products here will fully sustain me in so

the city; then, upon return to the city, visit the Mosaic Tile Works and Owens Pottery Company, which places your programme says you will visit this afternoon. In the way of sustaining my position that you had better defer that visit until to-morrow, I would say that there are no paved streets within some distance of these plants, while if you wait until to-morrow the coaches will take you right to the works, and you need not be from under cover at any time. We will also take you to the American Encaustic Tile Works, the largest in the country, having twenty-seven kilns and employing about four hundred people, in which I know you will be interested.

This will take until 11:30 in the morning, and those who are obliged to leave at that time can leave the party as it passes through the city, though we trust all will be able to remain. We will then take you around the belt line on to the hill east of the city, where the water works are, and where is located the new plant of the Zanesville Roofing Tile Company, and to the Townsend Brick Company, with their new continuous kiln of thirty chambers, which is the first of its kind in this part of the State, and has been in successful operation about a year, I believe.

From that point you will gain a view of the city which is the finest we have to present. You will see the river as it comes in at the east and runs through the city, with its eight or nine bridges spanning it, some of which are fine structures. I think a finish of that kind will no doubt be of a great deal of interest.

If you cannot avail yourselves of this trip in the manner presented, we will try to change the plans to suit you—we are the servants and you the master. I will ask you to decide the matter,



ED. F. DARNELL, President.



J. D. RUMSEY, Vice-President.



PROF. EDWARD ORTON, JR., Secretary.

naming it, and it certainly is fit and proper you should meet here. We have here great clay industries, which we will endeavor to show you if we get your time long enough. We have here a production of thirty million paving brick, about fifteen million ornamental pressed and front brick, two large potteries, two tile works, the first in the country to go into the business of displacing the expensive marble mosaics. The American Encaustic Tile Works is the largest in the country, if not in the world, and the Superintendent has written that he will keep open house and be ready to receive you when you may see fit to come. We have numerous other factories which it may not be apropos to mention, but which some might be interested in visiting—glass houses, rolling mills, furnaces, etc.—and there is another branch of industry which some will probably be interested in—the breweries. We have some of those.

The programme we have laid out, so far as the Zanesville end of the entertainment is concerned, does not agree with that mapped out by your worthy Secretary, Professor Orton, owing to delay on our part, for which he was not to blame. But if you could alter your programme, having your sessions all to-day, and giving us to-morrow to entertain you, I think you will not regret it. We have arranged for a special train to be at your service, and the programme is to visit Roseville, seven or eight miles out of

however, as soon as possible, for if we make a change it will be necessary to make arrangements with four different superintendents, as we go over four different lines.

We thank you very much for coming to our modest city, and we feel highly honored to have you here. You should give the people in the clay industry a chance to show you what they have. There are other good places over the State—Canton, East Liverpool, Akron and others—and after you have visited them we will be glad to have you pay us a second visit. We do not want to monopolize you every year, but we want to treat you in such manner that when it comes our turn again you will be glad to come to see us. (Applause.)

Secretary Orton: Mr. President, it seems to me, in view of the exceptionally kind and hearty welcome which the city of Zanesville has, through the President of its Board of Trade, presented to us, the least we can do is to accept the change of plans as far as possible, and for that reason I move we accept the invitation extended and alter our programme as necessary to allow the arrangements made to be carried out.

Motion seconded by Mr. McClure. Carried.

On motion, the matter of enrollment was allowed to pass until later in the session, when a larger number should have assembled.

At this point the regular programme was taken up, and the President addressed the Convention as follows:

PRESIDENT BIGELOW'S ADDRESS.

Gentlemen of the Convention:

I esteem it an honor to welcome you to this our Eighteenth Annual Convention. There have been many changes since its organization; many members have gone, never to return, and others have been added. I am glad to see so many here to-day. This is a social as well as a business meeting, and I trust every one will try to enjoy it.

From the papers to which we shall listen we hope to receive information that will be of benefit to us in the future. Three years of depression in business has reduced the price of our products, but I cannot say that we have suffered more than others. It would be well, however, to stop the progress of destruction in prices, for no man can be interested in any business for any length of time in which there is no profit. By getting a fair price for our products we shall be able to pay good wages and avoid strikes, which are very damaging to the laborer as well as to the employer.

We, as members of this Association, should endeavor to secure more clayworkers to meet with us; see them, talk with them and urge them to attend the Convention. For when a man in business at the present time does not leave it occasionally and learn what is going on in the world, he soon gets to be a back number, and he wonders how it is that others are ahead of him in business. It pays to keep posted and to be up with the times; and here, where we come in contact with other men who are acting and thinking in the same line, we learn something that will help us. These Conventions afford an opportunity for the exchange of thought and experience.

If there is anything that a member wishes to know, he has only to make it known, and if the desired information can be had it will be cheerfully given. If a larger number of the clayworkers of the State would attend the Conventions it would result in advancing the interest, both in the manufacture and use of clay ware. We should endeavor to become more interested in the discussions, thus bringing out ideas which will benefit us, for we are here to learn.

We should economize in the cost of production as far as it is

better to keep before the trade the stock, too, which is not just exactly first-class, and dispose of it if possible, rather than to condemn it and let it pile up on the yards and become worthless to us?

President Bigelow: The way I look at it is that we do not make anything on second-class ware. I do not mean to condemn anything.

Mr. Wilson: Is it not a good plan, when you are drawing the kilns, to be very cautious and put everything which is not just as it should be in a grade by itself? I have adopted that plan for many years. I make about three grades—first-class, second-class and culls. I never have been fortunate enough yet to burn a kiln of ware of any kind but what in some portion of the kiln I would find ware that was not just exactly as I had intended it should be. I think that is generally the case. I think it is best to make the grades when handling it in taking out of the kiln. I have never seen the time when I did not have customers for the goods I had.

President Bigelow: It is a very good plan to sort the ware as it comes from the kiln. It can be done cheapest at that time. If there are no further remarks we will proceed to No. 3, "A Review of 1896—and Now What?" by W. C. Wilson, of Brice, O.:

A REVIEW OF 1896—AND NOW WHAT?

Mr. President:

One year ago, during our annual meeting at Columbus, O., I read a paper in which I alluded to the trials that clayworkers were called to endure, and attributed some of those troubles to powers other than those which we often bring upon ourselves.

In attempting a short review of the year past, I am constrained to continue in the same channel to some extent as a part of my paper for this meeting. Not, however, because the duty is a pleasant one—to criticise—but the condition of the country has been and is such that in order to approach justice we must stare the truth in the face and fear nothing.

The early spring of 1896 bade fair for an average business with a few previous years. True, the farming element was not over-encouraged with the outlook, but many of them in my territory



W. B. MCCLURE, Treasurer.



E. BIGELOW, Ex-President.



W. C. WILSON.

possible to do so, for it is not safe to run the clayworking business at a long range. Watch your business closely, and keep your yards in good shape and free from rubbish. See that your clay is in good condition. The mixing and tempering of it affects the whole business, from the mill to the emptying of the kiln. Also see that the ware is well made and carefully handled, and, above all, have it well burned. Give plenty of time for the heat to get through the kiln.

Have the tile well sorted and carefully piled on the yard. If this work is well done it will help to build up a trade and get better prices, and you will be able to sell when your competitor, who makes rough, crooked and half-burned tile, cannot sell at all. There is a class of customers that will only buy and use the best, and they are the ones that it pays to please, and there is pleasure in making and selling ware that advertises itself.

Now, gentlemen of the Convention, I see that our Secretary has prepared an interesting programme, which we will now proceed to consider, and I trust we shall spend a pleasant and profitable time in so doing. (Applause.)

IS IT BEST TO SORT TILE?

Mr. McClure: I would like to ask the President if it is not

took the bull by the horns and improved their farms as liberally as they usually did with drain tile, and some that were building bought hollow block and brick. The only difference we could observe was that they seemed to hold the dollar a mite closer and gave their orders more sparingly.

During this time we were turning over in our minds the policy of improving our works with some much needed new machinery, and endeavor at least to aid ourselves in producing a better ware, also in reducing the cost to the consumer, and, if possible, induce him to let loose of the dollar more easily, and to encourage him to spend additional sums greater than his inclinations seemed to warrant.

In this we failed, and consequently the new machinery was not purchased, and we plodded along through the year as we had done before. We were not satisfied with this exactly, for our neighbor, seeing his stock being reduced so slowly, or not at all, cut prices and offered many inducements by the way of credit to make sales. Of course, what one manufacturer did in his business another was expected to do by the people who wanted ware. By this time the middle of summer was here, and we began to learn the extreme scarcity of money. The oldest settlers said money had not been so close since the war. Why was this, and who was to blame?

Who had the money? The farmer had abundance to sell, more than he knew what to do with, and his land outdoing itself to produce more. The prospect of the year was, indeed, gloomy. No market, no money. Our good old friend Jones, who had bought and used miles of tile on his farm, and whose check at the bank was never questioned, whether he had overdrawn his account or not, now found himself inquiring for money with which to pay his June tax. Our neighbor, Mr. Jackson, who had always attended the early morning city markets, and never had enough of produce to reach one-half way around, owing to the great demand for his especially fine articles, would drive home now with half his truck unsold, complaining of low prices and no money. He said there were plenty of city people out to market, but they did not buy, and no amount of persuasion could induce them to purchase. Why? Because they had nothing to buy with.

Many manufacturers closed down during the early year, discharging their hands. Others ran on one-half force and reduced wages, and rarely did we find a merchant or any business man who did not complain of a lack of trade and money which exceeded any previous year. So far this review has not been pleasant to write, because our mind will persist in reverting to much suffering, even during the very exciting times from July to November.

Now, let us study for a cause of these stringent, scarce times in the midst of plenty. We had heard for a few years back speculation as to capital and labor; how the wealthy capitalists and various corporations and trusts of our country were endangering the very foundations of our government, and crushing the common people (the laborer, the mechanic, the poor class) into abject slavery, or worse.

I had obtained my early political education before this doctrine ever had been enunciated. I was taught to have exalted ideas of these subjects. I thought, in my weak interpretation, capital to be the result of labor properly and successfully applied—the answer to the problem of enterprise and development. Consequently the two must be closely allied and inseparable. The political party that would adopt for its platform any resolutions to cause dissat-

mechanics and investments of capital than of our own. We had the capital, the labor, the provision to feed us, the clay to make our brick, tile, pottery, etc., the machinery to do it with, and mechanics to produce more, but we were all compelled to take a rest. Uncle Sam set the example and we have been resting a good while, but especially during 1896.

Cuba has been asking us for two years to please wake up and get out of that 16-to-1 rut, i. e., one nod of the head "yes" and sixteen shakes "no" for her independence.

The Great Britain arbitration treaty just now is more important than the Nicaraguan canal, and every schoolboy knows all about the Venezuelan boundary.

AND NOW WHAT?

While we are recruiting our wasted strength from the campaign of 1896 (not from the overwork of our clay industries, however) we should study what is for us in the future, and be ready to move at the first warning. Many of us have reduced our stock by not adding much during the past year. I observe, also, that in many localities the drainage industry is on the wane. We need not expect the trade we once had, and those of us who have a clay of sufficiently plastic nature should now begin to study diversity of manufacture. Allow me to suggest, however, that you do not rush headlong into something you may be sorry for very soon.

Hollow block is a growing business, and, like unto brick, will be in demand for time to come. Some of us are already studying clay roofing in connection with drain tile, and I trust to hear at this Convention something said for our benefit.

There are other clay wares to be made from common good tile clay that I could mention, which, properly understood, can be made profitable.

Many of us who have been dragging along for awhile need new machinery. We should remodel our old buildings to more modern ways of doing our work, thereby lessening the cost of production.



F. HALBEISEN, Erlin, Ohio.



A. V. BLEININGER, Columbus, Ohio.



C. W. CRAWFORD, Brazil, Ind.

isfaction or attempt to estrange capital and labor should never find a foothold on free American soil.

I was taught to believe that this country, importing annually \$3,000,000 worth of pottery and other burned clay to supply an aristocratic demand, took \$3,000,000 worth of work from our own clay-workers of the State of Ohio and the United States. Further, that the importation of 300,000 head of foreign cattle per year, to accommodate a speculative demand in our country, took from the farmer the larger part of the grazing and feeding, to say nothing about the breeding of nearly an equal number, and paid our government the ad valorem duty of 51 cents per head instead of \$10 specific, as it once did.

We also know that during six months of 1895 and six months of 1896 there was sent to foreign countries \$28,000,000 in gold to purchase woolen and cotton goods for the capitalist and laborer to wear, while our farmers were lamenting that they were compelled to plow and plant so much corn with the price so low, because they could not breed, graze and feed flocks and herds of sheep as they once did, when this industry was in its prime.

The spinning wheels of New England and other parts of our country, with their mechanics and laborers begging for work to manufacture this vast amount of goods, or even one-half of it, in order to enable them to purchase some of the farmer's surplus for themselves and families, for the want of which they were suffering, were compelled to remain idle. Is it any wonder that farmer Jackson complained of lack of demand for his produce when the laborer could not buy because no one would give him employment and pay him? The laborers stood at our gates from early morn until the ninth hour, yea, the eleventh, and no husbandman or capitalist appeared and told them to "go into my vineyard and work, and whatsoever is right I will pay."

I might enumerate many more of as bad or worse neglect of our own people. What is the cause of this, did you say? The first cause is that the proud government of our country has for the last four years taken better care of other countries' laborers and

The time is coming, and, indeed, already here, to begin to save what we have been heretofore throwing away or losing for many years. Brother Eudaly must get his kilns arranged to utilize the heat in every particular.

The political complexion of the country is such as to insure very little agitation of the money question for at least a season. We are a producing country, very largely, and while we must import many articles for our use which we cannot as yet produce, let us be conservative, and at the same time generous, with our foreign neighbors.

Let every Ohio clayworker put his shoulder to the wheel and push. Do not expect too much right away, or look for the boom in all business to work like magic, or you will be sorely disappointed. Rather let us have a healthy, increasing, sure, strong and slow return, thus insuring stability. Also, let us call a halt on fast living. For years we have been paying too much interest. When we had good times we did not appreciate them by paying our debts, but often made investments on hope; and hope, you know, is poor currency in times like these.

Our county and city officials must make up their minds to do with less salary. They must employ fewer clerks and work more themselves. The taxpayer is after them, and while we are cleaning up our factories and remodeling our work for the future, why not have a clean sweep all around and start anew, with the past experience as our guide—especially remembering the year of 1896? (Applause.)

There being no discussion of the paper, the Secretary was instructed to read the title of the next number, by Albert V. Bleininger, Cleveland, O.:

ROOFING TILES IN THE FATHERLAND.

Mr. President and Gentlemen of the Convention:

The subject assigned to me is a very broad one, one to which

justice cannot be done in a limited paper like this. I shall, however, endeavor to outline the main features and peculiarities of the German roofing tile industry in a brief manner.

Tile roofs are characteristic of European, and especially German, cities. Old and new buildings are found to be provided with such roofs, buildings which have endured the wear of centuries, as well as the most modern ones. This general use of the tile is the best evidence that they are an excellent roofing material. Much could be said in regard to their durability, architectural effect, etc., but I must confine myself to the process of their manufacture.

Tile roofs being so common, it is but natural to suppose that the manufacture of tiles must be carried on on an extensive scale throughout the country, and so it is. Tile factories are not limited to certain districts or to certain kinds of clay, but we find them wherever good brick clays abound. But I am, perhaps, not justified in speaking of tile factories, for really there are not many factories making roofing tiles exclusively; usually I found that the production of brick and tile was carried on together. Small plants make brick in summer and tile in winter.

Let us now consider the process of manufacture somewhat in detail, supposing the clay to be an ordinary ferruginous plastic clay, free from concretionary lime. A thorough preparation of the clay is considered by the Germans to be of the utmost importance; in fact, they claim that it is the secret of success in making roofing tiles, and we must acknowledge the truth of this view. Poorly prepared clay is sure to give rise to the most serious structural defects. The German tilemakers believe in weathering the clay, exposing it to the action of alternate freezing and thawing, and really there is no other process which is so successful in unlocking the structure and pores of the clay and preparing it so effectively for the purpose in view. Usually the clay is dug in the fall, spread out in layers of about two feet in thickness, and is left in this condition through the winter, to be worked in the spring. From the bank the clay is conveyed to the soaking pit or floor, which constitutes a very prominent part of a tile factory,

and this may occur to such a degree that the sand actually increases shrinkage. The grog is obtained by grinding up the waste from the kilns in ball mills, dry pans or other reducing apparatus.

Care is always taken to mix the sand or grog thoroughly with the clay by means of repeated spading. This being accomplished, the material is soaked for about twenty-four hours, and at last is fed into the preparing machinery, which, in most cases, consists of two pairs of roller crushers and a pug mill. The latter is sometimes provided with a sieve at its discharge opening for keeping back roots and similar matter. For the entire or partial molding of the tiles nearly always a stiff mud machine is employed.

CLASSIFICATION.

But now we have arrived at a point where we can no longer consider the making of tiles in general, but are compelled to classify them according to the modes of shaping the clay into tiles of different patterns. For simplicity's sake we may distinguish two large groups, the plain and the interlocking tiles. As belonging to the first kind, we must consider the clay shingles, called beaver tails in Germany, which are the simplest form of tile known, being rectangular slabs provided with a knob at one end, by means of which they are hung on to the laths, or having nail holes. Their standard size is 14½ inches by 6¼ inches by one-half inch. The other type of plain tiles is the pan tile. Little need be said about this well-known pattern. It is simply a curved clay shingle, with a single curve, like the half of our Spanish tiles. It is put on the roof in roll and gutter fashion.

The second group comprises all types of interlocking tiles. These, as the name implies, are provided with joints which overlap or interlock.

The plain tiles are either made by hand or with auger machines. I shall not consider the first method because it is being gradually replaced by the machine process, and also because its products are much inferior to those of the latter. In making the ordinary clay



W. A. EUDALY, Cincinnati, Ohio.



S. GEYSBECK, Zanesville, Ohio.



J. J. W. BILLINGSLEY, Indianapolis, Ind.

for here the highly important stage of mixing the clay is reached. As we all know, there are not many clays which, taken in their natural condition, can be made into pieces of clay ware like roofing tiles without showing too large a shrinkage or excessive warping. Most of them must be corrected to some extent, either by adding a plastic material to lean clays or non-plastic substances to fat, plastic ones. The latter case is usually the one which has to be dealt with in using the ordinary brick and tile clays. The non-plastic materials at the disposal of the tilemaker are of two kinds, the natural and artificial, the former being represented by sand, the latter by grog—burnt clay in the ground condition. As far as cheapness is concerned, sand would in most cases be the material to take, and, indeed, it is used to a large extent, but the makers of the best roofing tiles employ either grog alone, where the quantity of grog obtainable is sufficient to reduce the plasticity of the clay in the measure desired, or sand and grog together where the non-plastic addition required is too great to be supplied by grog alone. Now, there must be some reason for this preference of grog to sand, and there is. Practical experience has taught that tiles in which grog is used have more strength, show less warping and shrinkage than such containing sand. This may be explained by considering the manner in which both materials behave when mixed with a clay. The sand particles are non-porous, and, in burning, show a very erratic behavior in regard to shrinkage; that is, they shrink very irregularly, thus differing from the surrounding clay mass and producing a tendency to weaken the clay structure, especially if present in too large grains. On the other hand, grog is more or less porous; it absorbs water and enters into a more intimate bond with the clay body; its shrinkage is regular, though only small, of course. This may to some extent explain why grog is more effective in reducing the shrinkage as well as the tendency to crack in drying and burning. Clay containing grog can be pressed stiffer.

Wherever sand is used it is almost always a clean, sharp sand, free from gravel. Clayey impurities lower the quality of the sand,

shingles with a stiff mud machine the die may be constructed to run out single or double end-cut streams. The flat column of clay, if a single stream equal to the section of the tile, has a longitudinal rib at the middle of the top side. This rib furnishes the knob. Now, as the column passes out of the die on to the table it is cut off into the regular tile lengths. If a special tile table is used, the rib is removed in the same operation, leaving only a short piece to make the knob. Where an ordinary table is employed the rib must be cut off afterwards by hand or another cutting contrivance. The tool used for doing the hand-cutting is a wooden fork, between whose ends a wire is stretched.

In the case of a double stream the column consists of two tiles, one on the top of the other, connected by thin ribs, and having a rib on both the upper and lower surfaces. These double tiles are dried and burned together, and, after being taken from the kiln, they are separated by tapping with a hammer.

The same principle is employed in another system, where four tiles are run out together, forming a hollow block, with ribs, as shown by diagram. These blocks are first cut into the regular tile lengths on an ordinary table, and are then taken to a special cutter, where the wires are drawn along the block, severing the ribs from the tiles, only leaving the usual knob. Though cut, the tiles remain together with most clays, and are dried and burned in this condition. They are, of course, easily separated after burning. In this system the warping is reduced to the minimum; the tiles forming this combination keep each other straight, so to speak. This method also permits of burning the tiles harder, even up to vitrification, with less danger of deforming than it is possible to do with any other arrangement. Clays with very much shrinkage, or very lean ones, cannot be worked in this manner. The ribs should properly be called waste, but as they are a convenient source of grog, which often is sufficient to put the clay in the right condition, they are not a loss by any means.

I might mention another way of making clay shingles, applied where the clay has a great tendency to warp. Here a square hol-

low block passes out of the die, each of the sides being equal to a tile in width and thickness. Inside of each wall, at the middle, a rib runs along. At each corner of the die a thin steel knife is fastened, which makes a cut along the edge, but does not sever the sides entirely. The inside ribs are removed on a table designed for this work. This may, of course, also be done by hand. The blocks are separated after burning. This system is well adapted for turning out curved tiles like the Spanish, with, of course, the necessary modifications. Whenever it is desired to provide the tiles with nail holes, the piercing is usually done after the ware has stiffened.

In regard to pan tiles, I would say that they are pressed on stiff mud machines like the shingles, but, of course, with somewhat different cutting tables. Pan tiles are used quite a good deal in some parts of Germany, and a number of modified patterns are to be found, some of them combining the pan-tile shape with the interlocking principle.

The second group, the interlocking tiles, comprises the real interlocking tiles, with both longitudinal and transversal joints, as well as such with longitudinal joints only. The latter kind is made on stiff mud machines entirely. These are often made hollow so as to reduce the weight and the liability of warping. This type is being introduced quite largely in the northern parts of Germany, and wherever they are made comparatively straight they are well liked. Their manufacture offers no special difficulties.

The true interlocking tiles are the highest class of tiles, and their manufacture requires an additional machine, a repress. The process consists of two operations—molding the blanks, which is usually accomplished with a stiff mud machine, and pressing them into tiles on a hand or power press. Various systems of presses are found in operation, which comprise all the mechanical principles, cranks, screws, cams and levers, but the most popular one is the revolving press, which now, thanks to the enterprise of an American machine builder, is represented in the United States. The capacity of a hand press varies from 1,000 to 1,800 tiles per day; that of a power press from 2,500 to 5,000. The most important part of a tile press is obviously the mold, which is usually of plaster cast into iron boxes, although some are made of phosphor bronze. Plaster molds are a constant source of expense, owing to their short life and liability of breaking. They have also the disadvantage that the clay cannot be pressed stiff, and soft tiles do not lock as well as stiffer pressed ones. It seems that there exists a certain prejudice against metal molds, for apparently, by using stiff clay, with proper lubrication, and steam-heated dies, they should do as good work as the plaster molds, with the advantage of durability. I am confirmed in this statement by the experience of several German tilemakers who have discarded the old plaster nuisance for metal dies. On the other hand, the plaster molds are defended by some who claim that the oil used in lubricating the dies forms a film on the surface of the tiles which causes discolorations and retards the drying, thus causing warping. To this may be replied that proper lubricants, quickly evaporating oils, would do away with that trouble. However, I do not deny that there may be certain clays which cannot be pressed in metal molds. In operating the ordinary revolving press five hands are usually required—one for feeding, one for taking off and three for trimming the tiles. Where plaster molds are used and two presses are running, a man is kept busy part of the time in making the molds.

DRYING.

Roofing tiles are always dried on pallets, and quick drying must be avoided. Otherwise they are subject to the same laws as drain tiles.

SETTING.

Little trouble is experienced in setting plain shingles made by the block system alluded to, where they are treated exactly like hollow blocks. The others require more care. Where the clay stands up well the tiles may be set as many as twelve courses high, they being set on their long edge, with a flat binding course of brick on top of each course. Where the clay is liable to soften at the finishing heat, the tiles are set on top of other wares, like brick or drain tile, or stands of fire brick may be built up, which relieve the lower courses from the weight of the upper ones. Special care must be taken to set the tiles tight, so that there is no danger of tumbling. When necessary they should be wedged with pieces of brick and clay.

BURNING.

Nothing need be said about burning, which is the same as for other clay wares.

In order to improve the color of the tile clay or to produce a uniform color, it is a common practice to slip the tiles, before burning, with a clay slip burning the desired shade.

In some parts of northern Germany the roofing tiles are made to undergo a peculiar process, which is called bluesmoking. This treatment gives to the ware a dark color, varying from silver gray to blue. It is the result of a chemical and a physical process in burning. The tiles are burnt in the usual manner up to their finishing heat; at this stage the kiln is closed perfectly tight and a hydrocarbon of some kind, usually the refuse from oil refineries, is introduced into the kiln. The carbon, finding no oxygen, immediately reduces the iron oxide in the clay to the lower form, the ferrous oxide, which gives a dark color, and at the same time, owing to the excess of carbon present, the pores of the ware are filled with graphite-like carbon. It is of the greatest importance to keep the kiln as nearly air tight as possible. In order to hasten the cooling, and consequently lessening the danger of oxidation,

the arch of the kiln is often kept wet with water. The process of bluesmoking may be carried on in any small kiln with tight walls. Every red-burning clay is suited for this purpose.

At some places the roofing tiles are made impervious to moisture by dipping them in tar while still hot from the kiln. Special tanks have been designed for accomplishing the same thing.

Glazing of roofing tiles is practiced to a large extent. According to the refractory qualities of the clay, the glaze is either a lead or an alkali silicate. Slip glazes are, of course, only used for tiles made out of stoneware or fire clay. The lead glazes are most frequently met, and, according to Dr. Seger, their composition, as a rule, lies between the two which I quote, the first one being the lowest, the second one the highest fusing one:

First—223 parts of lead oxide, 60 parts silica.

Second—94 parts potash, 56 parts lime, 223 parts lead oxide, 101 parts alumina, 60 parts silica.

The higher melting glazes are satisfactory in regard to weather resisting power, while the lower ones are worse than useless. It seems to be the opinion of some German tilemakers, as well as others on this side the water, that they can protect a poorly burned body by a glaze, but, of course, this is a sad mistake, and it is to be considered as an axiom that both a well-resisting glaze and a hard-burned body are necessary. If either of them is lacking in this respect, destruction through the influences of the weather, the atmospheric acids, etc., will be sure to take place in a short time. Some very pretty effects may be obtained by using colored glazes, as I had occasion to observe quite frequently.

COMPARISON.

Now, a few words as to the advantages of the different tile patterns. First of all, of course, ranks the true interlocking tile in all its best forms, in regard to appearance, weight, roofing quality and cost. The plain tiles may, perhaps, be somewhat cheaper in some instances, but really, considering everything, the interlocking tiles are the best in all respects. Their greatest efficiency is shown on a roof of from 45 to 55 degrees. It has been estimated that the average cost of a square yard of interlocking roofing is nearly equal to that of a yard of plain tiling, the balance being in favor of the latter. But it must be considered that for the plain shingles a double layer is required in roofing.

Clay shingles also make a good roofing when they are straight. Their liability to warp and their weight are against them. Of course, with the aid of mortar, hair plaster, etc., a perfectly tight roof can be made with them. For barns, factories, sheds and similar constructions they are very suitable, and they make a better showing the steeper the roof is. They are used to a surprising extent in Germany.

Pan tiles, according to my opinion, are somewhat superior to the shingles in roofing quality, but are heavier and cause a lively circulation of air through the roof.

The interlocking tiles with longitudinal joints, made on stiff mud machines, are satisfactory when straight, but if warped they are not better than the clay shingles.

An ideal roofing tile should have the following qualifications:

It should be dense and well burned, light, strong; it should have a smooth surface which allows the water to run off easily, and a shape which guards against the blowing in of rain or snow, and, lastly, an agreeable appearance and color.

Tests which might indicate the quality of tiles are the absorption and freezing tests. But it would, perhaps, be a good plan for a prospective tilemaker to build a trial tile roof and test it to his own satisfaction with artificial streams of water.

In conclusion, I would say that the roofing tile industry is bound to grow rapidly. It is a business which demands the best abilities of a clayworker, but which may offer the conscientious, pushing manufacturer a fair profit. It is of special importance to drain tile manufacturers, who, according to the present outlook, want such a side line in order to keep busy, and the roofing tile business is one for which they are already equipped almost completely.

Concluding, I would say that in simply selecting from the multitude of designs a popular European pattern, the best is not obtained, for the European tiles have not reached the climax of perfection by far. There is room for original improvement, and I am convinced that before long we will have typical American tiles which, in point of highness and design, are really the best. (Applause.)

Secretary Orton: Mr. President, there is another paper on the programme representing another phase of the roofing tile situation. The writer, Mr. C. W. Crawford, is not able to be here, but has sent his paper, which is the next best thing. Since these two papers are parallel, and since our programme will be altered this afternoon in any case, I suggest that we hear Mr. Crawford's paper now.

Suggestion adopted by general consent.

ROOFING TILES AND THEIR MANUFACTURE.

The trade of the clayworker ranks among the oldest industries. Fragments of pottery are the oldest relics of civilization, and the surest proofs of the condition of prehistoric races. Pottery is found in Mexico amidst ruins that date beyond the conquest. Etruscan pottery antedates the oldest Roman civilization. Being among the oldest industries, it ought to be among the most perfectly developed. Clayworking, in its connection with the building trades, has not nearly attained the magnitude it is destined

to reach, being handicapped by the heretofore plentiful supply of timber, a condition that cannot hold much longer. The sawmill has had its inning, to the lasting injury of the country, such as is not known and would not be tolerated in any other country.

It is now the opportunity of the clayworker to make amends, as far as possible, for the mischief done by the sawmill. We have the consolation that, while it is inevitable the trade of the woodworker, already declining, must ever continue to decline, that of the clayworker is only fairly inaugurated, and, unlike woodworking, its resource is inexhaustible and it must ever continue to increase, and will soon make up for lost time. Comparing ourselves with other countries, we may expect building materials of all the more substantial kinds will be wanted in greater quantity than ever, and none will be in greater demand than roofing tiles. The trade that has been most neglected will undoubtedly be uppermost when it has received the attention it ought to have.

Tilemaking, next to brickmaking, is the greatest of the clay industries in other countries than this. Tile roofs are universal in all of Continental Europe, and are much used in the British Isles, where slates are so plentiful. All of the known varieties may be found in any of the old cities, from that resembling a drain tile split in two, or that having a reverse curve like a letter S, or the flat shingle tile, among the older styles, to the modern interlocking tile now in exclusive use. The fashions in these tiles vary so greatly that the idea of a patent tile in this country is absurd. The tribe is so numerous and so venerable that it is difficult to conceive of any new thing on this side that is not in use on the other. The underlying principle of them all is the same—that of a tongue and groove, arranged with the groove facing upward and the tongue of the opposite tile fitting loosely into it. This is the single lock, and is the more common. But some are made with two tongues and two grooves, called a double lock. This latter plan is more secure against wind and fine snow, but, having greater lap, they are necessarily heavier, but both kinds are water tight if of good quality. No tile roof is air tight, and the ample ventilation they admit of is considered an advantage in making the house cooler in summer without being colder in winter. Some of the old pan tiles of S shape are laid with cement, and are fairly tight, but the expansion and contraction must inevitably crack the cement. It is the common practice now to lay tiles as they come from the factory, without cement, except in fitting ridge tiles and hip rolls.

Tiles are held on the roof mainly by gravity, by being made with a nib on the under side that hooks over the slat on which it rests. These nibs are usually punched for nails while the tile is soft in such a way that the nails are driven into the upper edge of the slat. Some tiles have no nail holes, but, instead, a nib on the bottom, near the lower end, punched for a wire, and it is not considered necessary to wire every tile, but only a few scattering ones. Some are made with nibs to hook on the slats, but none for wires and no nail holes, depending upon gravity alone to keep them in place. It is not necessary to use solid sheeting, but only slats three inches wide. But in the case of an old roof already sheeted, solid narrow slats, one-half inch thick, are nailed on top of the sheeting on which to hang the tiles.

Almost any clay that will make good brick or drain tiles will make good roofing tiles, but it is essential that it shall dry straight and without cracking. Most kinds of clay will do, but there are kinds that appear to be first-class that cannot be dried without going to pieces. A specimen of such clay was sent to our firm for trial from Minnesota, from which we never got a whole tile, but the pieces burned to a fairly good red. Other specimens we have had that would dry over the boiler or anywhere. Common surface clay is more liable to crack than others, but when mixed with, say, 20 per cent. of shale or fire clay it generally works well and dries almost anywhere, and may be considered an ideal clay for tilemaking. The admixture of shale reduces the usual red color, which is its only fault. Pure fire clay, or potter's clay, makes excellent tiles as far as quality goes, but the color is bad. These are good if treated with a slip of some kind or with pigment ground in the clay. Anyway, fire clay can be relied on not to warp or crack and to stand a very high heat, which shale or surface clay will not. For bluesmoking almost any clay can be used, but the better the clay the better the tile, and hence fire clay or some mixture of it will make better blue tiles than any other, and the danger of overburning is a small factor. Bluesmoking is an excellent means of disguising underburned tiles. They all come out one color, and the bad ones look as well as the good ones, but that need not mitigate against the process, which is an excellent one if the ware is burned properly. In preparing the clay for tilemaking it is important that it shall be ground and screened finely, using a No. 20 or 24 screen, and thoroughly pugged and worked through an auger mill into slabs a little less in area than the tile—say one inch less at each side, one-half inch less at each end, and thick enough to contain a little more clay than the tile. The surplus overflows, and a fin is left around the edges that must be trimmed off. The pressure is not necessarily very great, and as the press runs almost idle during its revolution, except at the point of greatest pressure, it will be seen that very little power is required.

I have mentioned that the clay should be ground and screened finely. This can only be done by working it dry, and it may in some cases involve the necessity of drying artificially. But there is the alternative of washing or slumming it to get the grit out of it. Anyway, there must be no coarse grit in it, or it will destroy the dies rapidly by lodging in the parting of the dies. As the clay is pressed downward in the dies it spreads outward in all directions, causing a crushing friction of all its particles, whereby it is thoroughly welded, as it were, into a homogeneous mass, without the possibility of lamination. Therefore, tiles made in overflow dies may be relied on to be without flaws. It is important to note this action of the dies in thus crushing and welding the

clay as it flows under pressure, in contra distinction from that of a repress, in which there is no overflow, and only an embossed impression can be had. With the latter all the laminations and other imperfections are pressed into the tile, it being well known that pressure alone will not reduce laminations. Hence it will be understood why overflow dies are used; and, further, that the very action that insures the clay to be homogeneous defeats the use of metal dies by wiping the oil off as the clay flows over the metal surface, and causing it to stick, it being well understood that metal dies can only be used under any circumstances with plenty of oil. Plaster of paris being the only known material on which clay flowing under pressure will not stick, it becomes a necessity to use it for making the dies. The maintenance of dies is the most difficult part of tilemaking, and it would be desirable, if it were possible, to discover some more substantial material for the purpose. Various schemes have been tried to harden the plaster to make it more durable, but so far very little has been gained. It must be borne in mind that the porous quality of the plaster must be maintained perfectly. Any application to the surface to harden it destroys its porous nature and defeats the object sought to be attained. The dies consist of shells of iron fitted to the press and to each other in exact register. To fill these dies with plaster it is necessary to have a matrice, or model tile, set in plaster in one of the shells. Then mix the plaster by sifting it into the proper quantity of water in a bucket, using a fine sieve. When the plaster is filled up to within one-half inch or less of the top of the water it is to be thoroughly stirred and mixed, using the bare hand. It should be as thick as possible, yet flow freely in pouring. It is now to be poured into the iron shell, filling every part up to the parting line. Leave it stand until nearly set, then place the matrice with its shell on top of the plaster, one shell guiding into the other. Now place it under a press and screw down steadily, and slowly, if necessary, to get a smart pressure on the plaster to bring the dies together. Leave it stand until it becomes warm, or longer, before taking apart. Trim the edges and it is ready for use, except that it is safer to dry first. When ready to use it, place it in a tank of clean water until it stops bubbling, then place it on the press for use. If not quite wet enough, apply more water with a sponge. Too much water is as bad as too little. When the dies are in good condition the tiles drop off readily; there is no sticking to the plaster. When the dies come together under pressure there is still a film of clay between the iron shells. This film sticks to the iron, but as there is a margin of plaster between the tile and the iron shell to which the film does not adhere, the weight of the tile, together with its centrifugal force in revolving from one position to another, breaks the film loose from the thin edge of the iron shell. The films have to be trimmed off as the tiles come from the press. This is done by placing the pallet, with the fresh tile, upon a very small revolving table, using a bow-shaped knife with a fine wire cutting edge. This work is done by boys or girls.

Tiles are generally burned in square up-draft kilns, but there seems to be no good reason for adhering to this plan. The modern down-draft kiln would appear to be the ideal kiln for tiles as well as for brick. However, the most important factor in the process is the ability of the burner. Opinions are divided as to burning in seggars or without. It is a safe plan to use seggars, but it is equally certain that tiles can be well burned in tiers five feet high without.

Numerous objections are urged against tiles for roofing by those who know nothing about them, the principal ones being: They are heavy and require a strong building to support them; they require more rafters or stronger ones; they will accumulate ice and snow, overflow and leak; they cost too much, and all that.

The fact is, they are not heavier than a good slate roof, and the rafters ought to be strong enough for any good roof. They do not accumulate ice to cause overflow, and no icicles accumulate at the eaves. They do cost too much, but when they become better known and more largely used they will become cheaper and in greater demand, and afford a greater aggregate profit to the manufacturer. (Applause.)

SIDE ISSUES.

Secretary Orton: This question of roofing tile is one which I have taken some little pains to secure for the discussion of this Convention, for the reason that it has been intimated to me, in the course of the last year or so, that drain-tile makers are commencing to look rather anxiously for what the traveling salesman would call a "side line." The industry of drain-tile making I am hardly prepared to admit has reached the climax. There are certainly vast quantities of arable land in this State which would be the better for underdraining. But I do think it is probable that in tolerably large sections of the State, at least, underdraining has been carried on to a larger extent in the last ten years than it is likely to be in the next ten years. The greatest consumption of drain tile in these districts has already been witnessed, and as it has been, in most cases at least, well and thoroughly done, it is unlikely that much of it will have to be replaced, and the trade must therefore depend on extensions rather than for renewals for business. We have in Ohio something like five hundred drain tile companies, whose trade will have to decrease rather than increase, unless they find for themselves some business into which they may profitably direct a portion of their energy. I am not altogether clear in my own mind that roofing tile is

the one which drain tile men should undertake, but it has been intimated to me that this is what they are looking toward. So I have tried to have the subject introduced in order that you may argue it from your standpoint and from the standpoint of the roofing-tile maker. I think we will agree that Mr. Bleininger's paper is a most exhaustive one. I am proud to say that Mr. Bleininger is a pupil of mine, but I dare not claim that I taught him what he has just presented to us. He has learned that from other countries. He has had the opportunity to learn the extent to which they are used abroad, and their methods of manufacture, which I have not.

Mr. Eudaly: I think these are two magnificent papers. I do not know when I ever heard two better papers on any subject read in this Convention. It is an unusual thing for so much valuable information to be given. Clayworkers are not always willing or able to give information in such a clear and concise way, especially when they think they have a good thing. In speaking of this question of making roofing tile in connection with a tilemaker's business, etc., I am of the opinion that the drain tile business in this country has just begun. I do not believe that the drain tile business in this country has reached the top. I believe the farmers and drain tile manufacturers of this country are learning more and more every year of the use of drain tile and the necessity of having it. I know quite a large farm now that has very little drain tile on it, but which will be drained pretty thoroughly this season. And while I am on that subject I would like to talk with any one here who thinks he could furnish good drain tile at Hamilton, O., at reasonable rates. I believe that drain tile manufacturers, as in other lines, have their ups and downs, dull and good seasons. I predict for the drain tile manufacturer very excellent business for a number of years, beginning now soon; perhaps not this season, but within a year or two. I believe that as farm products become cheaper and more is being raised, the farmers will learn that they have to raise their crops cheaper, and that they must get their lands in better condition for farming, so the farming will not cost so much and they may get a greater yield. I believe, also, that the drain tile manufacturer will learn rapidly in the next five years better methods of manufacture, so the ware can be made cheaper and handled with less loss. The business is gaining for itself a better system, and therefore I predict for the drain tile business better times. I believe, however, that the time will come when drain tile manufacturers and brickmakers will make different lines of wares. I believe the time is coming when the drain tile manufacturer will make roofing tile, hollow blocks and brick, and all kinds of wares to supply the demands within his reach.

Mr. Billingsley: I suppose, when the drain tile business is called into question, one would naturally suspect I would have something to say. There are reasons for a depression in the drain tile business. One is that we have had a series of dry years the country over. But that is not the only reason. I would like to know what is the trouble with the brick business? It has certainly not been drought in that case. I might ask that question in regard to a good many other lines of business. What is the matter with them? We are experiencing a general depression in trade, with the exception of a very few lines. I am situated so as to know as much, perhaps, in regard to the drainage interests of the country as almost any one, and I never, at any time in the history of my experience along this line (which covers some twenty years), received more inquiries in regard to the benefits of drainage and regarding the future of the drain tile business. And this has been from unexpected quarters, including States which have not heretofore taken any interest in this matter. Large areas of the country are taking this matter into consideration. I grant you, Mr. President, there are localities in this State, Indiana and Illinois where the business, to some extent, has been overdone, and quite a good many tile manufacturers have gone out of the business, partly on account of lack of demand for their products and partly on account of a general depression in business.

But I do not suppose that because there is a depression in the brick business now we are going to quit using brick in Ohio, or that because there is a depression in the tile business, on account of general depression of business and on account of recent dry years, we are going to quit using tile. I believe the time will come in the near future—I believe I will say during this administration, Mr. Eudaly—during this administration just coming in (for I understand McKinley is in favor of tile)—when the drain tile business will become active again and the times be favorable to most of us. There is one other point I would like to speak of, and that is in regard to side lines. Professor Orton has spoken of the probability of successfully making the manufacture of roofing tile a side issue. I have made some little observation along this line for the past ten years, and have known a number of tile manufacturers to undertake the manufacture of roofing tile. There are only a very few clays that are adapted to this business. I know of quite a number of men who undertook the manufacture of roofing tile who did not make a success of it because their clay was not adapted to it—that is, with the brain power which they possess. I know one or two men now who are attempting to manufacture drain tile who are not succeeding, and who are not likely to succeed, for want of a proper mixture.

Mr. Eudaly: Notwithstanding the administration?

Mr. Billingsley: Notwithstanding the administration. I do not believe the incoming administration will ever see success for them. My advice to every tile manufacturer would be to go slow in regard to making roofing tile a side issue until very sure of your clay, and your ability as well. (Applause.)

Mr. Darnell: I have been reading a good bit on the subject of roofing tile, and it was through Mr. Eudaly's influence I did not get nipped last spring. Some men in his town wanted to contract with me for fifteen carloads of roofing tile. We agreed on everything except one point—that of payment. They wanted me to ship to them as they wanted the goods, and let them pay when they got the money. I told them (after writing Mr. Eudaly as to their standing) that I could only sell for cash, and have heard nothing of them since. My clay has been pronounced very fine for roofing tile. I believe that, with suitable clay and a little extra expense, the tilemaker can manufacture roofing tile as a side issue and there would be money in it until the tile business booms again, if it ever does. But I think the bulk of tile business has been done; I know it has in my part of the country.

Mr. Eudaly: How well is that country tiled? How close are the strings of tile?

Mr. Darnell: Not one-half of the tile is down, but the rush is over. If it had not been for making hollow block I would not have done any business at all this year. I had a good hollow block trade. I closed down in August last year and this year at Christmas.

Mr. McClure: I am to be classed with the manufacturers of tile who are not particularly stuck on a side issue. Any clay-working line demands attention, but if this roofing tile business, which has heretofore not been successfully worked, can be made successful by tying it on to a drain tile factory, of course that is all right. But I do not see why, if men with excellent facilities, men with brain and the clay, do not make a roofing tile that can come into general use—a tile down in price and weight, straight, uniform and glazed properly—if they cannot overcome these difficulties, how are we to do it? Why is this difficult piece of ware better adapted to be made by the drain tile manufacturer? It is my opinion that when there is a great demand for tile roofs there is going to be an increasing demand for the line of wares we make. I want to know further, as you say this is so well adapted to our business, what machines are necessary? You say it requires a stiff mud machine; I suppose the majority of drain tile manufacturers have it. I would like to know what they will bring when put on the market, and what the cost of manufacture? You talk about buying a few tables. Of course, tables do not cost much; machine men know that. If something can be brought

before the Convention which is practical for us to deal with, I would like to hear it. I would like to know why the drain tile manufacturer is so much better adapted to make this difficult piece of ware and put it on the market? What has given the drain tile manufacturer all this prominence lately? If some gentleman will answer this and other questions I desire to ask, I will be obliged. And I want to say that I do not think our business has gone up the flume at all. We are here, and will be all right if we just manage our business properly.

Mr. Ashby: Mr. President, I do not know whether there are any readers here of the paper which I am associated with, but if there are any present it will not be necessary to say how thoroughly I am an advocate of the manufacture of roofing tile, not only by drain tile manufacturers, but by all clayworkers. But I do think that the drain-tile maker has, perhaps, some facilities or advantages greater than those of other clayworkers, inasmuch as he already has and is used to burning in the kiln which is most suitable for roofing tile—I mean the down-draft kiln, round or square. About the development of this business, I will confine myself to the other side, though not either to France or Germany, which do not seem to touch us so much as the practice in England. When I was a boy, in fact, the only roofing material of that country was a tile, and was called a pan tile or Dutch pan tile. The way the reader of the first paper used the term "pan tile" is not quite correct in speaking of the German tile. The pan tile is in the shape of the letter "S," and was used generally on all the houses in Holland. The Dutch pan tile was the tile in common use in England, when I was a boy, on nearly all kinds of dwellings in the cities. I lived in a house in the center of London that had a pan tile roof. Some thirty years ago I put about three hundred squares of pan tile roofs on a number of small buildings, and afterwards had the mortification, some ten years ago, of seeing all those pan tiles replaced by corrugated iron. The whole secret of that is carelessness, lack of attention, and, I will say, dishonest work on the part of the roofing-tile maker. These tiles were so commonly delivered warped, underburned, made of badly tempered clay for the purpose of excessive cheapness, that in the end slate roofings for the better dwellings replaced the pan tile, and corrugated iron replaced it for industrial buildings. About ten or fifteen years ago a new kind of tile, a lock joint tile, which, I believe, we owe originally to the French, was introduced, and this, with the better workmanship of the new article, the better form of the roof produced by means of it, makes it far and away superior to anything else, and has brought roofing tile in favor again in England, and they were making a great deal of it at the time I left the country for good. I think that should be a lesson for our tile-makers and those who propose to become tilemakers in this country, although it is necessary to make them cheaper, for not many people can pay \$40 a square for roofing materials. I can tell you of buildings in Chicago where \$40 a square was paid for roofing tiles. But they ought to be made cheaper, and at the same time made well enough to give complete satisfaction and be permanent.

Mr. Darnell: Professor Orton made a remark which does not seem to find much favor here. I suppose I should be the last to hint or believe that the drain tile business is declining or should decline, but I do take side with Professor Orton to this extent, and I think all may fairly do so. We all know that clay wares, whether brick, tile or what not, can only be transported a certain distance. There is a certain radius within which a factory must work. Outside of it the cost of transportation kills the profit. Many drain tile manufacturers have filled up their radius. While there are large tracts insufficiently drained, or not drained at all, yet there are centers which are sufficiently drained, or nearly so, and to those I think Prof. Orton's remarks would, in truth, apply. Inasmuch as these centers are about finished, something else, as the manufacture of roofing tile, the use of which has not yet commenced here, might with profit be taken up by makers of drain tile or other clay wares. As to the price of tiles, this question was dis-

cussed at the Buffalo Convention last week, and it seemed to me that the consensus of opinion was in favor of the smaller enterprises taking up the making of roofing tiles on a small scale as a side line. But one gentleman, a friend of mine, and a maker of high grade roofing tile, spoke on this point, and endeavored to be as impartial as he possibly could, but the tendency of his remarks was unfavorable to it. But then he is a maker of roofing tile himself at a high price, and it is perfectly natural that he would not be in favor of a lot of small manufacturers springing up and making it at about a twentieth part of what he gets. Nevertheless, if roofing tile is to take the place of wood shingles or slate, if roofing tile is to be the popular material, it must be made at a popular price, and at a fair living profit, which, I think, is all any of us want. I see no reason why the same ratio of price should not obtain as it does for brick. And if that be done, whether as a side line or as the sole industry, it is sure to be a success.

Secretary Orton: Before we pass this I want to correct one or two impressions that seem to have gotten out. I thought I made my language guarded enough, but it seems I have given rise to some little misapprehension. I did not intend to have the gentlemen of this Association think I imagined the drain tile business dead and buried. I wanted to say that in the nature of the case it would come to a maximum point some time, and at that time, owing to the durability of the article, the business will commence to decline. I have been told—and I am glad that Mr. Darnell seconded my remarks on this point—that this condition, in certain portions of Ohio, at least, is already upon us. I do not make drain tile myself, and do not get in touch with those that do much oftener than once a year, when I meet you, and so I have taken the statements of those in the industry, and that report has been brought to me by men in the business. For that reason I have taken the action I mentioned towards having this subject discussed. Mr. McClure wants to know why we are taking such a pressing interest in forcing off this business of roofing tile manufacture on the drain tile men, and he evidently thinks there is a "nigger in the wood pile." Roofing tile may be of several grades. Bricks are made in several grades, from the common building brick, at about five dollars a thousand, to the fine high grade bricks used as veneering material for the best grades of city buildings, which bring all sorts of prices, multiples of five dollars five, six or seven times. Because some bricks bring this high price is no reason all should, and because some bricks sell for five dollars, it is not necessary that all should sell for that. There is room for gradation in roofing tiles, and, as stated by Mr. Bleininger and Mr. Crawford, the roofing tile industry as practiced in the old country is strictly on a par with the common brick business. It does not require more intelligence, the grade of ware is not higher, the kind of kilns used are identical and the value of the product is commensurate. That is why it is suggested that this Association can profitably look into the matter. You work common clay by the stiff mud process; you have dry houses of ample room in which roofing tile could be safely and conveniently dried as well as the material you do make. These are some of the reasons why we are bringing this forward. There is roofing tile of a very high grade made in this country. I have seen some of it, and heard the gentleman who makes it talk about it. It is a work of art, and he gets fancy prices for it. I do not advocate that each one of you should try to get into his business. You could not if you wanted to, unless you went through the experience he has gone through. But I have suggested that you take up the manufacture of a ware easy to make and bring it into use in this country, which you can do if it is put on the market and pushed. The demand is created by the product in almost all lines of industry, and so it would be with this; and if the facts reported to me are true, I think it would be a good plan for some of you to look this matter up.

Mr. McClure: If you will continue reading papers like the last two I will agree to stay until next week. I asked the questions I did to get just this information, for I thought it

would be the best way to get it. So far as I am concerned, I wish we might continue to probe it a little deeper.

THE QUESTION BOX.

Secretary Orton: The first question in the question box, I confess, I put there myself, and I am sure there are men here who can answer it. The question is, "Is Porosity a Benefit or a Detriment to a Drain Tile?" I have heard arguments on both sides.

Mr. Billingsley: I think the question of porosity of drain tile is like the old saying about a chip in the soap—the soap is just as good without the chip, and it is just as good with the chip.

Mr. Wilson: I believe I remarked incidentally, in speaking of grading of the ware on taking it out of the kiln, that you will have soft burned tile which is called more porous than the hard, flinty body, and you will always have a customer for that kind of tile. I have found that some farmers will not have a hard burned tile; they think a soft burned tile is more porous and will take up the water better, and I do not discourage them, though it is not in accordance with my views. If I take a few cents less on the rod for this class, and it is what he wants, it aids me in cleaning up my yard. If he thinks that class of tile is best for his soil, I think so, too, for his money is just as good to me as that of those who want the hard burned tile.

Mr. Eudaly: I do not believe the distinction between porous and non-porous tile should be made by stating that a porous tile is a soft burned tile and a non-porous one is hard burned. I do not think that distinction will hold good always. Two or three years ago I bought a great many tile and planted a lot of them. I had some of these left over, and they are still standing in the lane, where they have gone through two winters, some three. These tiles were not made by the same manufacturer, nor from the same clay, and some, when hauled to my farm, I was not pleased with. My judgment in condemning them, to a large extent, came from what I had learned at these Conventions. One lot were lighter in weight, were porous and hard burned. They seemed to be of more of a sandy texture and took water quickly. The other tiles were flinty, burned very hard and took very little water. Now, these tiles which I felt like condemning, though they were good enough for drain tile, have laid right along in the same lane where the other tile have laid. A few months ago I was having them gathered together, and my attention was called to the fact that the tile which were so solid and dense were, many of them, breaking to pieces where they laid on the ground, with the freezing and thawing, and these porous tile, so called, lying on the other side of the lane, were not damaged. It was a new idea to me, for it has been advanced in this Association time and again that porous tile, on account of taking up more water, is more liable to freeze and burst to pieces.

President Bigelow: I knew of an instance near Oak Harbor, O., of a tile made from a certain clay which could not be burned hard enough that it would not crumble in freezing and thawing.

Mr. Wilson: I have experimented with making porous tile, preparing the clay by mixing it with sawdust, putting in from 20 to 50 per cent. of sawdust. I made a porous tile which was very light, but at the same time I never could get the farmers to use them for the reason that they thought the others were good enough. So I abandoned the making of them, though I tried it thoroughly and effectually.

Mr. Eudaly: You do not mean to have us understand, then, that a tile is porous because it is poorly burned?

Mr. Wilson: No, sir. A drain tile does not drain land by filtration; the water goes in at the joints. But many farmers conceive that idea and believe it, and they want what they call a more porous tile, so that the water may go in faster and out faster.

Mr. Ashby: I want to call your attention to a definition of porous. Making clay material mixed with sawdust produces

what is called porous brick, but it is not porous in the sense of being penetrable with water. You may make tile porous with sawdust by producing cells, but the tile will be just as impermeable to water as without it. To make a porous tile the clay is mixed with sand. That makes a porous tile—a well-burned tile, not an underburned tile.

Mr. Wilson: The nearer all sand the better for a porous tile.

Secretary Orton: The next question is, "Will Coal Slack, Mixed in the Clay in Making Brick, Help in the Burning to as Good Advantage as if Used in the Fireplaces?"

Mr. Eudaly: That depends very much upon the kind of slack and the kind of clay you have. I would not advise mixing slack with most kinds of clays. To mix hard coal slack with clays is very profitable as they use it in the East, but in this country I think you should use the slack on the fires.

Mr. Wilson: I will say that I tried that experiment, too—that is, mixing slack with the clay in molding—and I never thought it amounted to much. I think the fire wants to be in its proper place, and not in the article burned.

President Bigelow: The next question is:

WHY DOES A GLAZE COMPOSED OF ALBANY SLIP NEVER CRAZE?

Mr. Eudaly: Is it a fact that it never crazes? The question would imply that somebody thought an article glazed with Albany slip never crazes.

Mr. McClure: What is crazing?

Mr. Eudaly: Little cracks on the ware.

Secretary Orton: I would like to hear from some of the stoneware men present on that question—if it is a fact.

Mr. Martin: I was just going to ask if Professor Orton could not give us an answer.

Mr. Kent: I never saw any Albany slip craze; I do not know why.

Secretary Orton: Have you ever seen a piece of ware glazed with Albany slip craze from any source?

Mr. Kent: No, sir; I never saw any break.

Mr. Eudaly: I understand what is meant by "craze" is the cracking of the glaze after it is burned. I believe it will craze, or crack. There might be clays you would use it on that would not craze, but the expansion and contraction of a great many clays is such that I believe it would crack Albany slip.

Mr. Billingsley: The craze may not come to the surface at all. The ware would be just as good.

Mr. Kent: On our milkpans the body is thin, probably not over a quarter of an inch thick, and I have seen them cracked through and through, but I do not understand that to be crazing. Crazing is just the cracking of the slip, while the body remains intact.

Mr. Ashby: Crazing, I take it, is the very fine hair lines that sometimes are scarcely visible to the naked eye. I have examined specimens of tiles in which there seemed to be no crazing, but under the glass, by moving it sideways, I found there were almost invisible cracks, crazing. That crazing is due to the difference in expansion of the glaze and body of the ware upon which it is placed. That is the whole secret of it. I have seen specimens of Albany slip used on stoneware and never have seen a specimen of crazing, and I do not think it can be found. Other glazes exhibit it constantly.

Mr. Long: I am told by stoneware manufacturers who have noticed the action of Albany slip that it does craze. The reason why it is supposed not to craze is the very dark color, and it is not easily noticed; it is hard to see. It has been discovered on pieces of ware which were very cold and taken into a warm room, where the steam very plainly showed the crazing. It seems that on general principles Albany slip brought to the fusing point should craze on a body not its equal in point of expansion, as well as any glaze.

Mr. Gorton: It is because clay itself is of an aluminous nature, and Albany slip itself is a clay.

Secretary Orton: In other words, it is a very excellent slip?

Mr. Gorton: Yes, sir. The formula of Albany slip approaches very nearly that of Seger cone No. 2, and requires a heat of about 1170 degrees.

Secretary Orton: I will ask Mr. Burley if, in his experience, he ever saw a case where Albany slip crazed on a piece of stoneware.

Mr. Burley: I have not noticed it in my experience. I never saw a piece of Albany slip crazed.

Secretary Orton: I never saw a piece of Albany slip craze but once. I was working with a body, a dry, porous tile, one day in the laboratory. I had a little extra space left in my muffle and I dipped this half tile into Albany slip, shoved it in, and, without further thought, sealed up the muffle. The fire was sufficient to burn the Albany slip to a bright color. When it came out there was no crazing on it, and I was surprised later to see that the Albany slip had crazed as other glazes do. It was simply a case of gross misfit between the body and glaze. There seems to be a great difference in the elasticity or strength of these glazes. Now, if we pursue the subject a little and make some investigation, we will find that Albany slip is a clay, and, like most clays, contains quite a noticeable percentage of alumina, while the more fusible ones, used on the lower classes of ware, as a rule, are quite low in alumina. So far as I see, it is a mere matter of elasticity of the glaze, due to high clay contents, rather than to its really violating the laws of crazing. If the body and the glaze do not expand together there will be crazing. If the glaze is elastic it will stand more strain; therefore, we have little trouble with Albany slip. Stoneware, on which Albany slip is the characteristic glaze, is always pretty hard burned. It has to be in order to be serviceable, and much of it, in the old times, was thoroughly vitrified. It is only in late years that we have seen much stoneware not vitrified. Now, when ware is vitrified, it begins to assume the condition of glass itself, and there is not the difference in behavior in heating and cooling as when of a soft, porous, open nature. Therefore the glaze and body tend to contract and expand in unison, and if the body is comparatively vitreous the Albany slip is not subject to the strains that other glazes are on other bodies. So we cannot say that Albany slip does not craze, for I have crazed it myself, but owing to the fact that it is usually burned on a vitrified body it very seldom gives trouble.

On motion the meeting adjourned until 1:30 p. m.

SECOND SESSION.

The meeting was opened by President Bigelow, who announced the first number on the programme to be a paper, entitled "Our Association," by E. F. Darnell, Grove City, O., and the paper was read by Mr. Darnell, as follows:

OUR ASSOCIATION.

The Ohio Tile, Brick and Drainage Association was organized Feb. 10, 1880. Mr. J. J. W. Billingsley, editor of the Drainage Journal, corresponded with a number of tile manufacturers, and, at their request, a meeting was called. There were fifty-four charter members who signed the Constitution, and many of them are still active members of the Association. The first officers elected were: President, A. M. Titus; Vice President, Philip Swartz; Secretary, Daniel Hess; Treasurer, W. S. Postle.

All of the meetings have been held in Columbus, with the exception of the sixteenth, which was held in Cleveland. In 1881 the second annual meeting was held Feb. 8-9, S. N. Titus President, Philip Hess Secretary pro tem.; forty-nine members present. Third annual meeting, Philip Swartz President, A. O. Jones Secretary. At the fourth meeting there were seventy-five members present; J. G. Wagner President, A. O. Jones Secretary. In 1884 the fifth meeting was held. This was when the tile business was at the top of the boom. All of the members present reported large sales, and could not supply the demand. Since that time many new factories have sprung up, and there has been no trouble in supplying the demand.

It seems to me that it would have been better had these reports been suppressed. The machine men used them to encourage beginners, and many men were induced to go into the business who saw their mistake when it was too late.

The sixth meeting was a large one, with about the usual report; same officers. The seventh, same officers, only forty-three

members reporting. The business was not so good as formerly. Eighth meeting, the usual report; same officers. At this meeting the propriety of identifying the brick manufacturers with the organization was discussed and finally agreed to.

At the ninth members reported as before; W. A. Eudaly President, D. C. Postle Secretary. Tenth, same officers; same report of members. At the eleventh the report of the members was more encouraging; same officers. Twelfth meeting, W. A. Eudaly President, R. G. Farnham Secretary. Up to the thirteenth meeting the only report of the Association was through the clay journals. At this meeting and the two following years a complete report was printed in pamphlet form, each member receiving a copy.

At the thirteenth meeting fifty-eight members paid their dues; J. W. Everal President, I. M. Justice Secretary. In 1893 the fourteenth meeting passed off as usual, without any excitement. The members mostly boomed the business, and reported much more business than they really did. Only forty-eight members felt able to pay the annual dues; same officers.

In 1894, at the fifteenth annual meeting, seventy-four members squared up for the year. At this meeting a committee of five were appointed by the President to formulate a bill and present it to the Legislature, then in session, providing for the establishment of a technical school for the education of clayworkers at the Ohio State University. A. O. Jones, of Zanesville; W. B. McGowan, Mt. Gilead; J. G. Wagner, Covington; W. A. Eudaly, Cincinnati, and Theodore Rhodes, Columbus, were appointed. They met and elected J. G. Wagner President and Prof. Edward Orton, Jr., Secretary. It was through this committee's untiring efforts that the school was established.

In the year 1895 the Sixteenth Annual Convention was completely swallowed by the National Brick Manufacturers' Association, the officers concluding to hold the meeting in Cleveland at the same time. It proved a failure, only thirty-four members reporting; same officers.

In 1896 the seventeenth meeting was held at the old headquarters, in the City Hall, at Columbus; W. B. McClure President, I. M. Justice Secretary. Fifty-two members were present.

The number of members reported is not all that are present; there are generally twice as many in the hall as report. This is one thing that we cannot avoid. Persons will come and get all the benefit of the Convention, and do not contribute one cent towards its support.

The good work that the Association has done in the past and the work that there is for it to do in the future should inspire us to perpetuate it. Many of the tilemakers are quitting the business, and we should interest other clayworkers to take their places.

In the past seventeen years the Association has had about the same number of members at its meetings; some years there would be a few more than others. Out of the 2,500 clay industries in the State, about eight hundred of them are tile factories. Why is it that only about fifty attend our meetings each year? Let us consider a few reasons why we should have a larger Convention.

First—Ohio is the greatest clayworking State in the Union. Its product in 1895 reached a value of nearly \$11,000,000. Millions of tons of Ohio soil are annually worked up into articles of utility and beauty, from the coarsest clay product to works of art, which find a market in many parts of the world. We rank well to the front in every line of comparison. In clayworking Ohio is first. In the pottery industry we make over half the white ware, one-half the yellow ware and three-fourths of the stoneware of the whole United States. Even in the line of ornamental pottery Ohio has the proud distinction of maintaining the first and only American art pottery. We not only rank first in the sewer pipe industry, but we have the three largest factories the world ever saw. In paving brick we are not only the pioneers, but the leaders as well.

East Liverpool enjoys the distinction of being the oldest center and of producing the men who have established many of the most successful potteries in every section of the United States.

Second—This Association, I believe, is the only Association of Ohio clayworkers that meets for the purpose of mutual improvement and discussion of the various complex problems which arise in the path of the clayworker more than almost any other craftsman. Does the Association represent all the clayworkers of the State? No. Why not? Because they are confined to one narrow branch of the clay industry in which any person can engage with very little experience.

Third—Is the work of the Convention progressing favorably? No. Why not? We have met for the past seventeen years and discussed the manufacture of drain tile and drainage. If you could read the proceedings of the Conventions it would be a reproduction from year to year. There are very few brick manufacturers that are members. The tile business is talked out; there is nothing new to say on that subject.

Fourth—What is the trouble? We have too narrow a field to draw from. What is wanted is more men, wider range, different business interests and more interest in the technical part of the work.

Fifth—How can we get it? First, by changing the Constitution and adopting a name and principles wide enough to bring in every one who is interested in the working of clay. Second, by meeting in new places and trying to get a local following in every place we meet. Third, trying to make our work up to date, and having new programmes and new subjects at each meeting. Fourth, by making visits to plants and learning by observation. (Applause.)

Secretary Orton: Mr. President, it seems to me that this is too important a matter to allow to pass without comment. If no remarks are forthcoming it must be because Mr. Darnell has quite taken our breath away. He has given a good descrip-

tion of the policy which has been dominating this society for years past, and from the progress of events the indications are not more hopeful at the present time. In fact, the last few meetings have not been as strong as for some years before. I do not think we can afford to pass this without discussion. We ought to develop the sentiment of the Association as to whether we are doing the best we can do, and, if not, whether we are willing to put a shoulder to the wheel in a new line.

Mr. Eudaly: Mr. Darnell has written a paper a little bit along the line I have, though I knew nothing of what he was going to say; and I thought it might be well, perhaps, to defer discussion until mine is presented.

It was decided to hear Mr. Eudaly's paper before further discussion of the subject, and the same was read, as follows:

THE CLAY INDUSTRY—NOW AND THEN.

In thinking of a subject about which I might say a few words at this time, it came to my mind that it might not be out of place to take a few field observations.

In hurriedly writing our Secretary that I would speak of "The Clay Industry—Now and Then," I did not stop to think I was putting myself somewhat in the same position as the schoolboy who chose for his subject "The Past, Present and Future," to be treated in a five-minute essay.

To my mind, it is well for us clayworkers to occasionally view the past that we may think well of ourselves. We should take stock to know our present strength, and speculate as to the future that we may become encouraged, so that "Now and Then," translated by the wide-awake clayworker, means literally "The Past, Present and Future."

If we undertake to retrace our steps in the clay industry we will find that for the first ten years, from 1880 to 1890, the descent is very rapid; that from 1880 to 1870 the decline is still rapid, but with long, irregular and uncertain strides. The ten-year period down the scale from 1870 to 1860 is noted as the standstill age of brickmaking, with, perhaps, here and there, a spasmodic effort along the line of improvements in methods and appliances.

We are now well on in the last period of the ten years closing the nineteenth century. It is said that the last half of the nineteenth century will go down in history as the great age of invention. In the past, war, poetry, literature and statesmanship have each, in turn, claimed the attention of man, and, in turn, each has produced her heroes. But it is in this, the last half of the present century, that man's inventive genius has eclipsed all his other achievements for the real betterment of the world.

In these wonderful strides of invention and improvement the clay industry has received its full share. While the making of States, the building of canals, railroads and many other betterments began in the East, the improvement in agriculture and agricultural implements, the advanced method of brickmaking and brickyard appliances began in the Middle and Middle Western States.

The strokes of improvement which began twenty years ago, dropping into the old-time hand yards, with their surface clays, soak pits, tempering wheels, drying yards and scoved kilns, have sent rivaling waves in quick succession to the lakes, gulf and oceans.

Did you ever stop to think that most all the great improvements in clayworking appliances for the last twenty years originated, practically, in about three of the Middle States, and that Ohio, Indiana and Illinois were the first to organize brick and tilemakers' associations, and that the National Brick Manufacturers' Association grew out of the idea of a Tri-State Association comprising these three States?

True, associations among potters, sewer pipe and fire-brick makers had been previously organized for the purpose, largely, of establishing uniform prices.

It must be remembered, however, that this Association has for its principal object the discussion of better methods of manufacturing, together with now and then an excursion into the fields of science in order that we may become more familiar with the great variety of materials with which we have to deal. In thinking of the subject in hand I wrote quite a number of manufacturers of clayworking appliances, with the request that they furnish me with one each of their oldest and latest catalogues. When I made these requests it was with a view of rehearsing, in short, some of the characteristics of the principal improvements made by each. But on receiving the catalogues, with, in some instances, kindly suggestions as to the leading features for "Now and Then," I found myself overwhelmed with the vast amount of useful and valuable data on the subject. Until then I had an idea I had kept pace with most of the leading improvements, but in this I found myself somewhat mistaken. In fact, there are so many improvements that I was forced to abandon the idea of even taking up the most important feature of each manufacturer's appliance, and, therefore, will be contented with a casual mention of some of the leading features of the clay industry.

CLAYS AND PREPARATION.

Thirty or twenty, perhaps even as late as fifteen, years ago but few, if any, of those manufacturing brick or drain tile thought of using any but surface or plastic clays, consequently such a thing

as a dry pan or large, heavy crushers and disintegrators were scarcely known.

Potters, fire brick and sewer pipe men were, however, using small wet pans and some other wet-grinding machinery.

Many of you remember, during the first years of this Association, the question of the advisability of using any kind of grinding machinery was often discussed. Many were the hours spent in discussing the digging and weathering of clay. Soak pits and grinding wheels were then considered among the higher arts of the clayworker.

Following the wheel came the smooth roll crusher, then the conical, corrugated, fast and slow speed, and many other shapes and styles of rolls and crushers. These improvements tempted the manufacturer to use more difficult clays. These, in turn, demanded heavier and different grinding machinery. Then came further developments in disintegrators, grinding mills and dry pans, so that now the prospective clayworker would just about as soon locate his plant beside a mountain of shale and rock as in a valley of loamy or sandy clay. In fact, for most kinds of brick, he would prefer the hills to the valleys, or, more correctly speaking, the hard, compact, shaly clays to the soft, sandy, plastic varieties.

These great changes have been brought about because of the willingness of the inventor to keep pace with the demands of the ever restless and dissatisfied clayworker. Whoever saw a clayworker that was altogether satisfied with himself or his results, except when arguing in our Conventions or when standing before a prospective customer or contending with a competitor?

KIND OF BRICK.

Then we had the soft mud brick, made by hand; now soft mud and stiff clay machinery takes the place of the hand molds, and the dry press is substituted for the click of the old soft mud repress.

With the introduction of dry presses came failure after failure, largely because of the very imperfect knowledge of the importance of properly selecting and preparing the clays, to say nothing of the very disastrous failures caused from imperfect burning, or, rather, in most instances, no burning.

I believe that if the inventors of dry press machinery had, at the first, understood how to properly select and prepare the clay for dry press brick this branch of brickmaking would have fared much better during the early stages of its introduction. The time was that from the very name of a dry press brick it was understood that they need not be dried before being set in the kiln. Now it is understood that all clay wares should be thoroughly dried before being set, and dry press brick offers but few exceptions.

The stiff clay brick grew largely out of the desire of drain-tile makers to utilize their tile machinery when not engaged in the tile business proper. Well do we remember when the enterprising tile-maker first began to explain in our Conventions the ease with which a brick die could be attached to the plunger or auger mill for making brick.

Then followed in quick succession the brick die, with its numerous improvements, including hot and cold water, steam or oil lubricators. These soon caused the necessity for converting the old stationary drain tile cutting tables into modern automatic end and side cut brick tables, which latter are just beginning to crystallize into perfect shape.

I warrant but few of the everyday users of these improvements have but a vague idea of the hours, weeks and months of time, to say nothing of the thousands of dollars, that have been spent in order to bring these numerous improvements in stiff clay machinery to their present state of development. While this vast amount of money was being expended in the machine shop, the venturesome clayworker on the brick and tileyard was fast adding craze to his brain and gray hairs to his head. But for the willingness of the manufacturer to experiment and the inventor to invent the clay industry of this country could not have attained the high state of perfection to which it has arrived.

Time will only permit a hasty mention of the wonderful development in drying from the old luted yard to the present tunnel system, with all its modern improvements and advantages.

Who does not remember when it was seriously thought that brick dried by artificial heat were not so strong and durable as sun or air-dried brick, to say nothing of bad color, whitewashing and molding, which artificial heat in a drier was supposed to produce. Now it is found that artificial heat, when properly applied, puts old "Sol" to shame, and that many clays which will not stand sun drying can be brought to a high state of perfection by artificial heat.

Modesty forbids much more than a mention of the wonderful improvement in kilns and burning. The improvements along these lines made the dry press possible and profitable. Also the paving brick industry, which of late years has made such rapid strides, owes its success largely to recent improvements in the burning and annealing of clay wares.

While the machinery man has been kept busy forging along the line marked out by the manufacturers' demanding more and better materials, the manufacturer himself has not been idle. To his courage and skill we are largely indebted for the great varieties of clay products. Where but only a few years since we had only ordinary brick, we now have innumerable shapes and colors, both in brick and terra cotta. Should the man of twenty years ago suddenly return to this earth he would not recognize the clay products in one of our modern brick and terra cotta buildings. The improvements along these lines have been so rapid of late years that one could scarcely take a trip around the world and know his own town on returning.

We have often heard the clay manufacturer grumble at the ever

persistent machine man, with his "new and better-than-ever appliance," but what of the poor consumer or the old-time, helpless architect, who stands bewildered in the presence of the great and never ending varieties of reds, buffs, browns, old gold and iron spots of the present day?

We'll do many of us remember the little concern the selecting of a new suit of clothes gave in the days of "blue jeans the year round." But now it often takes longer to make a selection from the great variety of suitings of the piece we prefer than to earn the money with which to make the purchase; so it is with the man who builds a modern house with modern materials. All this is brought about by the ingenuity of the manufacturer.

Another very important business, or, perhaps, branch of clay industry, which should not be overlooked is the part played by the trade journals which are devoted especially to this line of manufacturing. Only a few years since there was no such thing as a reliable publication to which the clayworking public could go for information, but now this branch of industry is as well represented as any other of the many trades and industries, and better than many. The clay journals have kept pace with the times and offered a convenient medium for the exchange of thought, which, to a great extent, has made it possible to know what our neighbor is doing, and with skill to keep pace with or even outdo him in the race. Journalism, like the varieties of brick or kinds of brickyard appliances, offers no exception to this wonderful age of improvement. Clay journals, like standard brick, terra cotta, machinery or kilns, have grown to be a necessity. We can no more do without the one than the other.

These are the mediums through which we make our wants, likes and dislikes known. These columns, when properly supplied from month to month with clear and accurate descriptions of the latest and best methods and improvements in the trade, become great educators. We should learn to give and take. That is, give the public the benefit of any new and valuable experiment or discovery we have made, and, in turn, expect and receive the same from others.

I hold that, generally speaking, any trade journal which is not a success owes its lack largely to a failure on the part of the particular trade it represents to give it good, wholesome support.

While patronage, as every one knows, is all-important to the machine man or brick and tilemaker, it is also very wholesome and desirable food for these great educating mediums, the trade journals.

Referring again to the work of this Association, it is well to remember that it was in our Convention three years ago that, by resolution, the first active steps were taken looking towards the establishing of a clay department or school in the Ohio State University. As a result of this move our State Legislature was induced to make an appropriation and authorize the establishing of the proposed clay department, or school, and the work was begun under the direction of Professor Orton, who was placed in charge. Through his efforts we are proud of having the best—in fact, the only—school of the kind in this country.

Formerly the clayworker began his apprenticeship in a crude way, with neither theory nor practice. This, in the very nature of the case, necessitated many years of weary plodding and toil before accomplishing much of value. Now the ambitious prospective clayworker has at least an opportunity to gain a knowledge of the theoretical principle of clay and clayworking, which, when properly put into practice, will doubtless mark many milestones on the road to a practical success in actual business.

The future—what of it? No one can tell. Doubtless many of the things now known will, in a few years, pass to the realms of the unknown and uncertain. Many of the now valuable appliances will doubtless be discarded by the beginning of the twentieth century. Notwithstanding all our knowledge of clays and improved methods, we believe there is still room for larger knowledge and more and better devices. We have only just begun to find out some of the most simple principles and requisites necessary to the proper handling of the vast mountains and valleys of clay covering our State and country.

Doubtless in the lives of many of us burned clays will be put to many uses of which we would not now even dare to dream. Are we perfect? No, not now; neither can we be so long as there remains one foot of unexplored territory in this wide domain of the science of clay, clayworking or clayworking appliances.

We need, therefore, to broaden our sphere of action and to quicken our pace of progress. What part will this Association play in this onward march of improvement? Do we not think the time has come when we should take an advance step? Would it not be wise to open our door to new thought and new energy along these lines? To my mind the time has come for a wider exchange of thought among the clayworkers of Ohio, or of the Nation, for that matter.

Suppose we adopt a new name, one which will include every branch of the clay industries of this State, now and for all time. For instance, suppose we name this Association "The Clayworkers' Association of Ohio."

In conclusion, with your permission, I offer this resolution: "Resolved, That this Association be hereafter known as 'The Clayworkers' Association of Ohio,' and that a committee of three be appointed to amend the Constitution and report the same at this meeting." (Applause.)

A NEW NAME.

President Bigelow: Gentlemen, the papers are before you, and are well worthy of discussion.

Mr. McClure: We have certainly no room to take exception to Mr. Eudaly's paper; clayworking is clayworking. To

bring the matter before the house for discussion, I move you that the resolution offered by Mr. Endaly be adopted.

Motion seconded by Mr. Darnell.

Mr. Endaly: I understand the only change in the Constitution to be made is a change of verbiage to accord with the change in title and consequent eligibility for membership. It has been discussed and decided from time to time that we should under no circumstances discuss wages or prices, but that our discussions should lead to the scientific side of the question, and for my part I have no idea of making any change along that line. We ought to meet for the purpose of discussing clays and the best methods of handling them, and not for any other purpose.

Mr. Billingsley: I have only this to say: I do not know what is intended by the resolution, whether it is to cut off all discussion in regard to drainage, but that is what it leads to.

Mr. Eudaly: I had no thought of that.

Mr. Billingsley: A very strict reading or interpretation of the Constitution, which includes only clayworking, would be construed that way.

Mr. Eudaly: I would not think so.

Mr. Billingsley: It is true that when the Association was first organized the only interest considered was that of making drain tile, and the uses and benefits resulting from drain tile. But it is very clear that we have grown in these eighteen years. A little further along, after we had met two or three times in annual meeting, we included the brick interest, and that has since become an important interest. A little further along we have included other clay interests. So far as those who are making drain tile are concerned, the matter of selling drain tile is very important. The same is true of other clay products, yet it is not expected that the means of selling brick and pottery ware of different kinds will not be discussed, and for that reason I conclude that, in a measure, interest in the draining of land would lose its place in this Association. I think I can read the handwriting on the wall. We have papers on drainage every once in awhile, but land drainage and its benefits were the leading discussions in the former history of this Association, and, Mr. Chairman, great good has grown out of it. The daily papers, in the early history of this Association, were full of reports in regard to your State Drainage Association, and created a great deal of public interest upon this subject. I am not sure that the manufacturers of drain tile, in this change, will give to their industry as important a place in the future as they would like to have. I agree with what has been said on this floor that the clayworking industry of this State—not only of this State, but of all States—is of great importance, and should be represented by an organization. If, in changing from the Brick, Tile and Drainage Association of Ohio to that of the Clayworkers' Association of Ohio, you can carry with you the importance of land drainage in the future, as in the past, I should favor the change. You may do it for a year or two; you may inject land drainage into the programmes of this Association, but I anticipate that in a few years you will lose sight altogether of the drainage side of the question. I may be mistaken. It is not for me to say, however, for, while I am a member of the Association, in this matter of change you should look altogether to those who reside in your own State.

Mr. Eudaly: As I wrote this resolution without consulting any one, I will explain it. It is not for the purpose of making any change in our method of preparing programmes, discussing papers or interests. If we take the name of "Clayworkers' Association of Ohio" there is no reason why we cannot, in the preamble to the Constitution, specify what the objects of the Association are, and one may be the use of clay wares. Take drain tile, and there is but one use, so to speak—that of farm drainage. You cannot separate its use from its manufacture. Our National Brick Manufacturers' Association meets to discuss brick, but a large per cent. of the discussion is as to what can be recommended in the way of using brick to advance our interests. So I do not apprehend any trouble

along this line in the least. There are different lines of manufacture in this State, and we want to know more about clays. There are lines of manufacture in this State that have facilities for finding out more about handling clays than is possible for the average tile manufacturer to find out. We have a school in this State, which we are all anxious to support, which has the facilities to find out about the manipulating, the handling of clays, and we have large brick industries, potteries and many other institutions handling clays in the State which have more opportunities of finding out about the different kinds of clays than the tile manufacturer has. My idea is to broaden or name and call ourselves "Clayworkers' Association of Ohio," or any other name which might be decided on, so, if possible, to draw into the Association other clayworkers, who may be able to teach us about clays and the uses of clays. I would not vote for any change in our Constitution which would lead us from the discussion of drain tile and drainage, but I would like to hear discussions of the uses of brick and different classes of machinery, the handling of different kinds of clays.

Mr. Darnell: I do not see that the name of "Clayworkers' Association of Ohio" would debar any one from discussing drainage. As far as drainage is concerned, I think the farmers' institutes should take care of that. I do not see the need of bringing the discussion of drainage on the floor any more than the using of brick. But I do not think this would bar any tilemaker or user of drain tile from discussing drainage.

Mr. Halbeisen: I do not see a man here from a place nearer my section of the country than the President, though I devoted several days to an attempt to bring a club of clayworkers down here to attend this Convention. But I found my efforts useless, for they seemed to think the drain tile question talked out and no benefit to be derived from attendance at the Convention. I think we have as many tilemakers in our part of the State as in any part, having nine or ten in our county. The opinion prevails that since the adding of other clay industries the drain tile business has been lost sight of, and I think we should adopt some plan for the discussion of drain tiles and benefits of drainage in our Association. If we could only get prices in some shape, the business could hold out. The low prices are a great detriment to the drain tile business in my part of the country. For my part, I believe if we adopt this new plan it will result in driving the drain tile men out of the Association altogether.

Secretary Orton: Mr. President, this is a subject which I have held in mind a good deal in the last six months, not only as Secretary of this organization, but in my regular daily work. I suppose there is nobody here who has as much interest in keeping together some technical organization to consider technical problems arising in clayworking as I have. With me it is a matter of daily importance; with you a matter of importance, so far as the Association is concerned, once a year. I have the most urgent need of the formation and maintenance of an Association which shall help, in an educational way, the clayworkers of Ohio. I have undertaken what I was told beforehand would be a very difficult problem. I have undertaken to do that which it was freely predicted could not be done, viz.: the establishment of a school for the special purpose of teaching the technology of clayworking. I have been meeting with a measure of success, sufficient to encourage me so far as the school is concerned. I have demonstrated that these subjects can be taught in schools, and my boys have gone out and proved it in a practical way. But the school is only half of the work I would like to do in this State, in this country. I would like very much to maintain this kind of a school for those who are too old to attend school now, and who have been so unfortunately situated in the past that they could not avail themselves of the kind of education which the young now have an opportunity to acquire. Our opportunity for actual schooling is past, and we must gain what we can by mutual exchange of thought and experience in places of this sort. Now, then, I want to deal honestly with the Association. I came in in time to hear a part of Mr. Billingsley's remarks,

and, though I heard nothing Mr. Eudaly had to say in his paper, I have gathered the drift of it from his later remarks. I think Mr. Billingsley has a correct foresight as to what the change will be. I think farm drainage and the effect of that science will unquestionably take a back seat if other clay industries are invited to come in, and we broaden the Association so that it becomes the exponent of Ohio clay industries. As he said, we might inject something of the old topic into the new order for awhile, but the influence would die out in time. The question is, ought it to die out? I must be perfectly frank again: I think it ought, at least in this Association. From my point of view, this Association is one which should consider these problems from the manufacturing standpoint. We should consider the technology of the business, and while the use of products is quite closely interwoven with it, and the man who knows the one side should know the other, I think the farmers' institutes ought to study and discuss the question of uses of tile. If we keep to the manufacturing side of the question this Association will be in harmony with every branch of the industry in the State. A paper on the suitable clays for making stoneware will find an answering interest in the minds of those who are making all sorts of other wares. A man cannot listen to a paper on a subject connected with one branch of clayworking without finding something to help him in his own line. The clay industries in Ohio, while diversified, are none too wide to form one good, strong Association. I am free to admit that I am working for that end. I want to see the clayworkers of Ohio band themselves together in such an Association. I want to see the matter of price and commercial matters practically left out of the field of discussion in such an Association. I have noticed in this Association and in the National Brick Manufacturers' Association that the minute commercial matters are brought up, that minute trouble begins. They have tried in both organizations to adjust the minds of the majority to some certain notions of how to handle trade problems, but have never succeeded. A man must manage his own business affairs for himself; but there is a common ground on which clayworkers are able to stand, and that is the purely technical one of manufacture. The problems which the maker of fire brick has to solve are not essentially different from the problems of the paving-brick maker, so that the makers of paving brick and of other brick, the potters and tilemakers, and all branches of clayworking, can find pleasure and profit in a meeting of this kind. If this Association can make up its mind to broaden out and take in all lines of clayworking, I, for one, am willing to do all I can to help such an organization along, and it means a good deal of hard work to open up such a campaign. Illinois has such a strong organization, though it stands far below Ohio in diversity of clay work. Now, as to whether this organization is the one to take up this work or not is a question this organization will have to decide for itself. If the Association decides to broaden its scope it will be taking what, in my judgment, is the proper stand. If you think in so doing you will break up the old organization and make a new one of no use to you or anybody else, it is in your hands to act as you believe best. But I feel that I must put my work on building up a technical organization which shall help us all, and to that I am willing to pledge myself. But I cannot say that I am willing to continue to use my efforts for the building up of an organization which takes in but one small fraction of the field, and which mixes matters purely agricultural and matters purely commercial with technical matters.

Mr. Eudaly: I think it is clear to be seen that we are—

Mr. Billingsley: At the forks of the road—

Mr. Eudaly: —at the "forks of the road." (Thank you, Mr. Billingsley.) I think this is the fifteenth, at least the fourteenth, Convention of this Association I have attended, without missing one, and in all that time I do not remember missing a single discussion. I think I have heard every paper and the discussion on it for fourteen years. Now, I say to you that in the discussion of the manipulation and handling of clays this Association has not advanced as it should have done. For a

few years we made a great advance, but for the last several years we have not progressed as we should. Three years ago this Association took a very wise course in declaring in favor of a clay school in connection with our State University and appointing a committee to bring the matter to the attention of the Legislature. Now, in the very nature of things, unless we broaden the scope of this Association, we will, in a short time, lose all our connection, so to speak, with this school. This school is not going to stand as still as we have stood along the line of the science of clays and clayworking. It cannot do it; it will die if it does. That being the case, as sure as we are living, unless we broaden out and take these things in and use them, some other institution will. That is the way I feel about it. We have the pleasure of knowing that our Association was the originator of this school, the only one in the country, and we want to keep pace with it and get out of it all we can—make it useful to us. We are the largest clay manufacturers in the world, I suppose, for the same territory; at least we have the greatest clay State in the Union, and we ought to have an Association broad enough to take in all these industries. In making the change of name we would not be casting anything out. I believe in the survival of the fittest, and I believe the subjects will be discussed which are of the greatest interest, and, possibly, in that way some branch of the industry might be shelved for a time.

Mr. Billingsley: As I said before, I do not wish to attempt to control the action of the Convention in regard to the proposed change. It is very clear to my mind that the result will be, in the course of two or three years, to drop the discussion of drainage altogether. If you will take this programme and look it over you will find papers and questions for discussion which have been wisely prepared, so far as the clay industries of this State are concerned, and which certainly embrace as broad a field as Professor Orton could wish, all under the present name or Constitution, without any difficulty attending it that I know. It just comes to my mind, as an outsider, why cannot you go right on in this way, and if the drain tile interest drops out altogether, if the time has come for it to drop out, that will settle the matter. But this is not very probable, for there are here quite a good many who are interested in the manufacture of drain tile who would, in the future meetings, drop out themselves if they felt that the interests of drain tile were lost sight of. I believe that Professor Orton has been fair and honest in his view of the matter, and I think it is the correct view. There is no displeasure on my part with him for wanting to secure as far as possible in this organization a leadership in the clayworking interests. That is right. I believe another thing he said is true: that is, that the question of land drainage, in a large measure, should be left to the farmers' institutes. Yet I know it to be true in the history of this organization that many papers have been prepared and read which have been of incalculable benefit to the drain tile interests and agricultural interests of this State. I know much of the drainage literature has gone out from this Association and worked much good. So I rather regret to see that we have come to the forks of the road. I would rather have avoided it, if possible.

Mr. Rumsey: I cannot for myself see why the change would necessarily drop drain tile manufacturers. If necessary, the Convention could be continued one day longer and give them a chance to discuss their interests, at the same time bringing in enough other clay industries to make it interesting to all classes. I am sure it is interesting to any man in the clayworking industry, if it be but the manufacture of common drain tile, to listen to papers upon any subject connected with clay work. I do not see why a few drain-tile workers should bar all others out of the Association.

Mr. Ashby: It has been well said that this question has brought us to the forks of the road, and that reminds me that our forefathers chiefly used that place for hanging up people, and perhaps that is where I ought to be for being an Illinois man and talking on this subject. With all deference to this

Association, I think the most successful State Association is that of Illinois. Three years ago, I think, they changed their title and dropped the drainage question out of their programme, calling themselves the Illinois Clayworkers' Association. That has not interfered with their success and it has not interfered with the subject of drainage, in so far as last year, their second meeting, they had a paper on drain tile and drainage which was so good and so impressed the members that by a vote of the meeting it was decided it should be printed for general distribution. That thing has not been done since I have been a member of this Association. What I am calling attention to is the fact that this has been done in Illinois under the change and has not been done here in the same time. On this programme there is but one item relating to the drain tile business, and, if we go back to last year, my recollection is that in the discussions and the papers read there was no reference at all to drainage or tilemaking.

Mr. Eudaly: One of the most interesting discussions we had last year followed Professor Orton's explanation of the methods of measuring heat, and a number of tile men queried whether or not it could be applied to their tile kilns.

Mr. Ashby: That talk on the treatment of clays could not be counted as essentially belonging to drain tile manufacture. The point I wish to make is this: the mere change of title will not prevent the subject of drain tile being discussed so far as its interest merits, and retaining the title as we have it now will not keep that before us unless we feel inclined or interested enough in the matter to discuss it.

Secretary Orton: I want to say just a word more. The members of the Association may, perhaps, be interested in knowing what this programme means. This has been the first occasion I have had to act as Secretary, and is the first attempt I have made to get up a programme. Mr. Billingsley finds on it very little of drainage, and the programme at present is as broad as could be desired. This programme represents quite a little hard work on my part, and it is mainly due to personal influence which I brought to bear at the cost of much time and trouble that I was able to get up as good a programme as I have. It was not secured on the merits of the case, but I have gone to men and said: "Here, I want you to write on this subject as a favor to me," and if I had not done that we would have had no programme at all. I wrote to members of the Tile Association, and, except from a few to whom I addressed specific appeals, I received no response at all. There has not been a single query addressed to me from any of the members of this Association during the whole year. Under these circumstances, it is plain that the Tile Association is not in a very lively state, and if the work of the Association must be done by other heads, and still retain the present name of the Tile Association, it is an unjust state of affairs. If the papers come from those not interested in drain tile—and a majority of these are not—they should be consulted. If the drain tile people could come to me and say they had not been given a fair show it would be different; but I have begged for papers from them and received a "stone" in reply.

Mr. Wilson: I do not want to use time for more than a word. I am Superintendent of a business which originally started as a drain tile and brick business. I have been in that position for years. At the end of the first year I urged my company to diversify their business. The demand for drain tile was good—I did not complain of that—but our capacity was much greater than the demand, and it was necessary to do something, and I urged them to diversify the business. About every twenty years we run a generation in this country. This Association has existed about this length of time and has made wonderful progression. I attended the first Convention, and whenever I have been in the clay business I have been here. I have also attended the Indiana Conventions. I would not give a cent for a drain tile man who had not learned anything since he has been in the business. I have experimented with clays in the making of drain tile, brick and nearly everything that I could make out of clay. I am ready to take into the

Association every kind of clayworker, and I am not going to let him tramp on my toes, either, because it is a question of my bread and butter. I will be willing to come and learn something. Let us take progression right with us; let us change, expand and extend a helping hand to every worker of clay. This is what I have wanted and hoped to hear. It is time to launch out and let in every clayworking individual. (Applause.)

Mr. Rumsey: I did not attend the first meeting of this Association after I went into the business, but I commenced in 1882, and I will say that at that time I knew nothing about the business. I came off the farm and invested in the tile and brick business. While I am interested in all other clayworking, I am not manufacturing anything but common tile and brick, and I cannot see why any should object to a change of name or working in a larger branch of the industry. I think it would be a great benefit to us; and if, as our Secretary said a minute ago, more tilemakers are not interested in the work of this Convention, why is it? If the other branches of clayworking have crowded themselves forward and presented papers and worked up their interests it is because the tilemakers have been dormant and have not taken the active part they should in this work. And even if other branches of clayworking are brought in, tilemakers will have just as much right to bring in papers as they have now, and it will give us a chance to know something about other industries.

Mr. Halbeisen: While we are discussing other industries, is it not a fact that all these other industries are already organized, and that possibly we will not better our condition by allowing them to join us? I am very much interested in any clayworking industry, and like to hear all which may be said about clays, and am ready to abide by what the Association decides to do in the matter.

Mr. Billingsley: I do not wish to stand in the way of the change. I have no objection to the change, but I thought it might be well to discuss the subject and take in the field. After that has been done I am perfectly satisfied. I think it would be quite well, perhaps, to broaden the field.

Mr. Ashby: Would it not be possible to make a title that would differentiate from that of the Illinois Association?

Mr. Eudaly: There is one very great distinction: this will be the Ohio Clayworkers' Association.

Mr. Ashby: I would suggest that you call it the Clay Ware Manufacturers of Ohio to distinguish it from the Illinois Association.

Mr. Eudaly: What do we care for Illinois? We have a very great difference of title; this is Ohio.

Thereupon the motion of Mr. McClure to adopt the resolution offered by Mr. Eudaly was put to a standing vote and declared by the President to be unanimously carried.

COMMITTEE ON NOMINATIONS.

President Bigelow announced the Committee on Nomination of Officers, as follows:

Messrs. W. A. Eudaly, W. C. Wilson, Geo. J. M. Ashby.

Secretary Orton: The first question in the question box for this session is:

DOES REPRESSING INCREASE THE WEARING POWER OF A PAVING BRICK?

This is a matter that it is important for paving-brick makers to know. I will ask Mr. Turner for his opinion on that subject.

Mr. Turner: I did not come to talk; I came to hear. It is my opinion that it improves it. That is the way we make them, which is the reason I express my opinion that way.

Secretary Orton: I do not like to do all the talking, but I finished some work for the National Brick Manufacturers' Association a short time ago and presented my report to them at their last meeting. The work is the first practically finished under their new system of taking up scientific problems and getting to the bottom of them. This Association has not got that far along hardly. The National Brick Manufacturers' Association

has been undergoing a sweat similar to our own. It seemed that they had said about all there was to say on brick-making. They had, as far as off-hand opinions went, but they wanted facts. A commission was appointed to investigate paving brick testing, and as an outgrowth of that I was told by the commission to take up this subject and investigate it. If the gentlemen here would like to spend a little time on it I will show them what we gained. They may be thus the gainers of what the National Association paid for.

Thereupon Professor Orton made a detailed statement of the work done under this instruction of the commission, explaining by means of a chart the results obtained. The original articles, with chart and table, may be found among the proceedings of the National Association in the clay journals. Continuing, he said: I do not claim this is conclusive. I would like to hear from others.

Mr. Wilson: I would like to ask a question. With either end cut or side cut brick, of course, you get the best results from repressing?

Secretary Orton: No, sir. The end cut is improved and the side cut is hurt by repressing. Perhaps I failed to make clear that the relative length of these lines (indicating chart) indicate the relative size of the losses.

Mr. Wilson: You say that end cut brick, repressed, are made better, and that it is a disadvantage to repress side cut brick?

Secretary Orton: That is the result on that clay.

Mr. Wilson: But you don't say it is proof for anybody else's clay?

Secretary Orton: No, sir; not till we have tried it on enough other clays to enable us to generalize. Mr. McManigal, cannot you give us a little light on this subject?

Mr. McManigal: I have been in the brick business for some time, but I did not come prepared to say anything upon that question. I think Professor Orton has given us a very fair exposition of the experiment there. I have been under the impression that repressing always helped brick. I know it it does not in one way it does in another: it improves the appearance of the brick very much, and in going into the market, if your brick do not look well, it makes no difference how good they are. In that respect the repressed brick has a decided advantage. My opinion has always been that the end cut brick is best repressed, and I have recently been experimenting along that line with some others and trying to solve the same problem demonstrated here with another clay, and as far as I have gone the indications are with our clay that side cut brick show less laminations than the end cut. I probably have different clay from that which Professor Orton used in his experiments. But I think the repressed brick is always preferable and of more ready sale in the market than that which is not repressed.

Mr. Eudaly: This subject, as presented to us by Professor Orton, gives us some idea of the possibilities along lines of investigating clays and brick. I feel that we have not been doing enough along these lines all these years. The facts which Prof. Orton has given us, as developed from testing a particular kind of clay, have been discussed pro and con in this and other Associations for years. I have heard the advantages and disadvantages of end cut and side cut brick, repressed and not repressed, discussed for the past six or eight years, and I always took the ground that an end cut brick was the best, and I based my reasoning upon the lay of the laminations or strata of clay in the brick. I have been strongly opposed in that view by a number of gentlemen who know a great deal about brick, and I must confess that in the last two or three years I have been partially convinced that I was mistaken, and that side cut brick are best, for the reason that so many manufacturers of paving brick are using side cut tables and repressing the brick. Not only this, but in the East, especially, I notice that engineers and committees appointed by City Councils to investigate brick very often specify side cut repressed brick, and I take it for granted they know what they are talking about. So I gave up

my pet theory about end cut brick. Now, I believe that every manufacturer of brick using a stiff clay machine would do well to purchase a rattler and test his clays and brick himself. I do not know what a rattler of this particular dimension would cost, but not a great deal.

Secretary Orton: One hundred dollars.

Mr. Endaly: I believe they will be made for less than that when the foundries get to making them. I believe when a man manufactures brick to any extent he should have one of these standard rattlers to test his clays both ways. I think a great deal along the line of what clays will do and what we can do with them will be brought out in the next few years by Prof. Orton's school and in other ways. I expect to find at the next National Convention a number of gentlemen ready to demonstrate that this test will not hold good with their clays, but, in the main, I think likely it will hold good. But I heard a number state that they propose to get rattlers themselves—with a nod of the head—and see about this. Professor Orton is not going to have all this business, by any means. I know a manufacturer in the great State of Illinois, in which Mr. Ashby boards (he wasn't born there, neither does he talk like a Sucker), a large manufacturer, who had in his works, in a concealed place, a rattler, which I think was not quite so large as this, from the time he manufactured brick. He rattles his brick once a month, and gets samples from competitors and compares them. I think the tile manufacturer should have some method of testing his tile also, and I think some method will be adopted in the near future.

Mr. Wilson: I want to ask one more question. Can you tell us what kind of a machine your end cut brick was made on? Was it an auger machine or a plunger?

Secretary Orton: They were all auger machines.

Mr. Wilson: All auger machines used in making the brick used in those tests?

Secretary Orton: Yes, sir.

Mr. Wilson: Then you had no means of testing a plunger brick?

Secretary Orton: I tried to secure the aid of companies who use plunger machines, and, after many refusals, I got one man to make and send me some, but they came too late to be tested. The chart on the board represents end cut and side cut auger bricks only.

Mr. Wilson: I suppose others have observed the same thing I have in condition of machines at the time tests like this are made. I have tested clays myself, and I have found in my own manufacture that the auger machine, with the same clay, the same mixture, from the same strata, will work different at times. An auger which is badly worn does not make good ware nor as much of it in a given time. I have also used a plunger machine, and am partial to brick made with this machine. But I think we should be more careful to observe the condition of our own machines.

Secretary Orton: Does that tendency exist as much in running brick off the machine as in small sections of tile? Is the difference not greater on tile than on brick?

Mr. Wilson: No, I think not. If the auger is perfect, the corners true and full, we get the full pressure of the auger, and if it is in good condition it is doing good work. If it is worn, we must be careful. With the plunger it is pressed out in one solid body and has no laminations. Therefore, I think it would have made quite a difference if you had had plunger brick in the test.

Mr. Endaly: I think the matter largely depends upon the condition of the clay when it is run through the machines. If the clay is in excellent condition there will not be so much trouble.

Mr. Wilson: It depends on the excellent condition of the machine also.

Mr. Ashby: Do you not find, Mr. Wilson, that the plunger machine has difficulties of another kind—if not laminations, that there is trouble from air in the clay?

Mr. Wilson: Yes; I never saw a machine perfect in every

way. We have air to contend with in the plunger machine, but I do not know whether it is much worse than the laminations in auger brick or than the effects of a worn-out auger.

President Bigelow: Does the tile blister when made on an auger?

Mr. Wilson: I never had any trouble of that kind with an auger machine—that is, blisters on the inside. I have had more trouble with blisters on the outside caused by air. I always aimed to get first-class plastic clay for making drain tile. I would not make it unless I could get first-class plastic clay; neither would I make brick unless I had first-class clay, then, if I did not make good brick, it would be my fault.

Secretary Orton: I would like to ask you one question, Mr. Wilson. Is it your opinion, sir, that lamination is more likely to occur in the structure of the auger brick than the plunger brick?

Mr. Wilson: That is my experience, Professor Orton; the greater trouble has been with the auger machine. At the same time, when the auger machine is in good condition, when it is new and in perfect trim, as a machine should be kept for making a good article of drain tile or brick, it does not occur so much. Lamination is worse when the clay varies in temper too much and the machine is badly worn. I would like to have known more about those conditions in the brick used for that test. Some of those machines might have been worn more than others; some machines may have been new. As Mr. Endaly says, we, as jurors, are likely to quiz you to death.

Secretary Orton: That is what I am after. I want to get you people to working for yourselves. I have set this up for a sample, and if you do not believe in the results, you may go home and do better.

Mr. Wilson: You see where you might be misled. We all know what difficulty we have to contend with in these machines wearing out; not so much that we discard the use of them, but they get rougher and make the ware a little imperfect, just as might have been the case with some of that.

Mr. Endaly: While I do not want to question this test in any way, yet when it was read before the other Convention there was something I saw about it which I apprehended might possibly have happened and which would not have been in any way under the control of Professor Orton. We know that to make a repressed brick more beautiful it should set a little while after it comes from the machine. I know a manufacturer who always allows the brick to stand in the bins before repressing. I have found that a brick made on an auger machine and allowed to stand a few hours or half a day before repressing will not make anything like as strong a brick as if repressed immediately from the machine.

Mr. Wilson: You believe that, do you?

Mr. Endaly: I believe it because I have tried it, and I think I know what I am talking about. I believe that is a fact, and if you take a side cut brick and allow it to dry partially, and then repress it, the structure of the brick will undoubtedly be damaged more than in the case of an end cut brick repressed in the same way. I am thoroughly convinced of that, for I have tried it. Now, perhaps, in order to make these brick very nice and beautiful, they may have been dried a little before being repressed. It is easier to make a smooth surface than if taken from the machine and immediately repressed. In that event the side cut would suffer more than the end cut brick. I do not say this is true, for nobody knows, and I do not suppose it could be found out. If it had happened, I think the test would have been much against side cut brick.

COMMITTEE ON CONSTITUTION.

The following Committee on Change of Constitution was announced by the President:

Messrs. W. A. Long, Frank Halbeisen, E. F. Daruell.

Secretary Orton: The next question is:

WHAT IS THE CHEAPEST GLAZE FOR ROOFING TILES?

Mr. Bleininger gave formulae of glazes this morning, but

he did not specify as to the cheapness. Perhaps he can tell us now.

Mr. Bleininger: I cannot say as to the cheapness in this country, but in Germany the second one I gave is supposed to be the cheapest, where the clay is mixed with the glaze, and I think they figure it down as low as about 3 cents a pound dry.

Mr. Eudaly: How much would a pound glaze?

Mr. Bleininger: I could not tell that exactly. I think it requires about sixty pounds for a thousand ordinary roofing tiles. I cannot say whether that is accurate or not, but about sixty pounds.

Mr. Wilson: What is the size of those tiles?

Mr. Bleininger: The size is about 14½x6.

Secretary Orton: There are some parties here who can enlighten us on that subject, I think. Mr. Long, can you give us something along that line? You know how to make a very fine glaze, I know.

Mr. Long: I do not know; I never had any experience with the cheaper ones. I understand the German glazers use the lead ore, a cheap form of lead, of course. I think that would form as cheap a glaze as any that could be made. I do not know the cost, however, or how much glaze it would take. That would require some calculation.

Mr. Gorton: It seems to me that if you could use a salt glaze it would be the cheapest. But if the clay would not stand the heat for a salt glaze, then take part of the body and use enough lead as a flux, and it would be about the cheapest glaze you could get. The cost would be about the same as Mr. Bleininger has given—about 3 cents a pound.

Secretary Orton: Take a part of the clay composing the tile itself?

Mr. Gorton: Yes, sir.

Secretary Orton: I will say that that is the original glaze our earthenware potters began on in this country. The only sample of it I ever saw was one old piece of ware made up near Ashtabula early in the century. There was a little pottery there, in which the owner probably turned his own ware, kicked his own wheel and burned his own kiln as often as he had enough ware accumulated. This was a small fruit jar, covered with a clear yellow glaze. The grandson of the man who made it had it, and he told me his grandfather's receipt was to take half and half of clay and red lead, using the same clay that he made the ware of. In that case it made a very good glaze. But I do not think that could be laid down as a general rule, for there is too much diversity in the clays.

Mr. Geysbeek: Take one-half part of lead and a half part of Albany slip and it makes a good glaze and a cheap one, for the Albany slip is a glaze in itself.

Secretary Orton: The last question on the programme for this session is:

DOES THE SPEED OF DRYING AFFECT THE "WHITE-WASHING" OF BRICKS?

Mr. Eudaly: In my judgment it has a great deal to do with it.

Mr. Ashby: In what way?

Mr. Eudaly: The query comes to my mind whether it is necessary to discuss that question. Perhaps there are gentlemen here who are ready to maintain that it makes no difference whether the brick or tile are whitewashed; and, if so, there is no use wasting time discussing that question.

Mr. Halbeisen: It got out that whitewashed tile were always sufficiently burnt, and some of my customers take them in preference.

Mr. Eudaly: They like them better?

Mr. Halbeisen: They do.

Mr. McClure: We do not make whitewashed tile; we dry thoroughly before we put tile in the kiln.

Mr. Darnell: I say that drying tile has nothing to do with whitewashing.

Mr. McClure: Is it good burning?

Mr. Darnell: No, sir, it is not good burning. When I see whitewashed tile in my kiln I find "shelly" tile in the bottom; they go together.

Mr. Eudaly: I would like Mr. Darnell to explain that.

Mr. Darnell: When we raise our fires too quick we find whitewashed pieces at the bottom, which were set when bone dry. It is caused by the vapor not being taken off quick enough and it settles to the bottom of the kiln. It is nothing but water, and a little will not hurt, but some are as white as that box (indicating).

Mr. Halbeisen: In our clay the whitewashed tile is not "shelly."

Mr. Darnell: What kind of clay are you using?

Mr. Halbeisen: We are using common washed clay from the river bottom; different grades of clay, black and yellow.

Mr. Wilson: Our whitewashed tile are not shelly. I have never yet seen a well-whitewashed tile come out of the kiln that any farmer need be afraid of taking on account of it being a soft piece of clay. They are not whitewashed until thoroughly burned.

Mr. McClure: Do I understand Mr. Wilson to say that his whitewashed tile are always on the bottom.

Mr. Wilson: That is the rule. The bottom is thoroughly burned and afterwards the whitewash gathers on the outside. I never saw it in the top, but on the bottom always. Sometimes, if the clay is green and damp, it will be on the second course. I have never seen a whitewashed tile not thoroughly burned—that is, a thoroughly whitewashed tile.

Mr. McClure: This tile in the bottom of the kiln is thoroughly burned, and afterwards the whitewash gathers on the outside? I do not understand that line of philosophy.

Mr. Wilson: I do not pretend to say when this whitewash gathers; but I never saw a piece of clay whitewashed but what it was thoroughly burned.

Mr. Halbeisen: Did you ever see a soft tile whitewashed?

Mr. McClure: We never whitewash tile. We haven't time.

Mr. Mentzer: I had an experience in this line, and I blamed it to the water with which I wet the clay. We wanted to clean the boiler and wet the clay with the water. We made it into tile, and when we came to burn them nearly half were white as the wall. Some tile men claimed it was the result of magnesia in the water, which made a smoke and burned on them. I use a Stewart kiln and make hollow block. I never have whitewashed tile on the bottom course; it is always the second, third and fourth courses. The top and bottom courses are never whitewashed.

Mr. Wilson: Is it a down-draft kiln?

Mr. Mentzer: Yes, sir. I would like to know whether anything in the water was the cause of that, or whether it was in the burning.

Mr. Wilson: I will not say I will answer the question; it is what we call one of the "deviltries" of clay. The mixing of your boiler water with your clay might have had its effect, but the reason your whitewashed courses are further up from the bottom is that you did not get your bottom courses hot enough to whitewash.

Mr. Halbeisen: I think the gentleman is not familiar with the principles of that kiln. The tile is burned last in the center. In this kiln the heat comes to the center, or, rather, the third or fourth course from the bottom, and the whitewash is in that part of the kiln.

Mr. Mentzer: The fire is on one side and goes under the floor and comes up, and that helps to heat the bottom course, and we never have soft tile on the bottom. If the burn is good, it is all good, and, if bad, it is all bad.

Mr. Wilson: Combustion takes place right at the top, under the crown of the kiln?

Mr. Mentzer: Yes, sir.

Secretary Orton: It seems to me a very pretty illustration which this gentleman has brought forward. I could not understand when he said his bottom course was never white-

washed, but that the second and third courses were, in a down-draft kiln. I can see now how this bottom course is heated first and thoroughly dry, so there is no opportunity for it to absorb the steam which brings out this efflorescence.

Mr. Endaly: Let it be understood, Mr. President, that this question of whitewashing has not been settled.

Mr. Billingsley: I wish to mention an observation made at a tile factory where the tile is always whitewashed, wherever the fingers have pressed the tile, all over the kiln, from top to bottom. Does this pressure of the fingers on the tile increase the capillary attraction so as to bring out the moisture and leave the salts there which we call whitewash?

President Bigelow: Isn't it a fact that some clays are difficult to burn without whitewashing?

Mr. Halbeisen: I think the whitewashing can all be prevented if you put the ware in the kiln thoroughly dry and give it plenty of time to watersmoke.

President Bigelow: I think there are some clays that this would not help.

Mr. Endaly: I want to ask if any gentleman has had finger marks showing on drain tile made from a sandy, loamy clay, or whether it does not come on a fatty or greasy clay, if I may be allowed that expression?

Mr. Rumsey: I had two different clays, one a fatty and the other a sandy, loamy nature. In the ware made from the sandy clay I never saw any marks; in the larger tile, especially, made from the other clay, we meet with finger marks.

Secretary Orton: I was reading a short advertising article a day or two ago, in which was published an extract, a translation from the German, written by a well-known German authority. He says: "Where I see finger marks on tile or other goods, it is to be concluded therefrom that the soluble salts that make the efflorescence come from the water supply." I do not apprehend, on the face of his statement, just how he proves that.

Mr. Endaly: I do not think he does.

Secretary Orton: But he makes the statement, nevertheless, that if there is efflorescence generally distributed on the surface it is due to soluble matter in the clay; if there are finger marks, look out for the water supply. I have had nothing in my experience that would lead me to see why he makes the statement, but I am inclined to give it a little weight on account of the authority that backs it. In regard to finger marks, I have puzzled a little over the question. It seems to me that the suggestion of Mr. Billingsley might explain it. The skin or surface of the clay is slightly abraded by the fingers, a dew or blush on the surface of the clay ware is disturbed by the action of the fingers, and what little water is in the clay ware evaporates more rapidly from that place, and what saline matter is in the brick will be found in greater quantity at that place.

Some further discussion was had along the lines already covered, but offering nothing new toward a solution of the problem presented.

Secretary Orton announced the time of departure of the excursion train on Saturday morning as 7:30, the members of the society only being expected to go as guests of the Zanesville committee, members to be identified by their badges, which could only be procured upon payment of dues. The Secretary also stated that he had with him copies of the specifications for testing paving brick, adopted by the National Brick Manufacturers' Association, which those who desired copies might have.

In answer to a query from Mr. McClure, the Secretary stated that he had received no report or communication from the committee appointed at last meeting to report on the subject of hollow block, and had no notification of its existence.

On motion the meeting adjourned until 7:30 p. m.

THIRD SESSION.

The last session was called to order at 7:30 p. m., and was opened by the reading of the following paper by the Secretary:

POROSITY AND FROST RESISTANCE IN CLAY WARES.

Mr. President and Gentlemen:

The subject of the paper has been suggested to me by several things which have occurred in my work in the last few months. One of these matters involved the production of a body with the greatest possible porosity, and some interesting features were developed in a study of the case. But the principal matter directing my attention to the subject lay in the recent action of the Testing Commission of the National Brick Manufacturers' Association, which reported to the Convention at Buffalo that they believed that no paving brick which would endure reasonable mechanical tests would ever fail owing to the action of frost.

This opinion, coming from a body like the commission before mentioned, is worthy of serious consideration and analysis, but, since it is contrary to most of the opinions on this subject which have been held for years past and which have been growing in strength, it should not be accepted without such consideration and analysis.

To begin with, let us briefly review the fundamental facts in the case before we attack the arguments in detail.

What, then, is the cause of porosity in burnt clay wares?

The investigations of the scientists have shown us a good many interesting facts about the structure of clays. Foremost of all of these scientists, perhaps, in regard to the physical structure of clays, is Dr. Aron, for a long time the associate of the world-famous Seger, to whom is due the honor of being the greatest of recent ceramic chemists.

Dr. Aron has shown us that a clay, in the plastic condition, is to be likened to a vast number of bodies of unequal size suspended in a fluid medium. The particles of the clay are supposed each to be enveloped in a film of water. In fact, there is enough water present when the clay is in the plastic condition not only to float each particle of clay, but also to allow a sensible space to exist between each.

When a plastic clay is allowed to dry out in the open air it shrinks more or less in this drying. And, if it is made the subject of trial, it will be found that the shrinkage and the loss of water by evaporation keep pace with each other for awhile, but that after a certain stage is reached the shrinkage ceases, while the loss of water by evaporation proceeds for a long time after. Dr. Aron tells us that during this gradual loss of water by evaporation the particles of clay are approaching closer and closer to each other, and that as they do so the clay becomes less plastic and stiffer in consistency, until, when the shrinkage ceases, the clay particles finally touch each other, and the water envelope, which has hitherto kept them apart and lubricated their motion, one on another, is finally broken.

But while shrinkage must now cease, since the particles are touching and crowding each other, still a great deal of water remains in the clay, filling all the interstices between particles. The clay particles cannot fill the space wholly any more than grains of wheat can fill a bushel measure fully. The time comes when no more wheat would go in the measure, but several pounds of water would go in without crowding any wheat out. Similarly, no more clay will go into a cubic inch when it has ceased shrinking, but there is room for water in its pores, just the same.

If, now, the evaporation be continued, this water continues to escape until finally the clay is wholly dry. The water which holds the particles of a clay in suspension and enables them to move freely on each other is called plasticity water or shrinkage water. That which remains in the pores when the clay ceases shrinking is called pore water. The numerical amount of either of these is easily measured by any one who will take the time and pains to measure and weigh a plastic piece of clay every few minutes from plasticity to complete dryness.

But some one will want to know if this water is all one kind or if this water and the combined water of the clay are the same. Shrinkage water and pore water are both the same; they are free and uncombined water, whose action is purely mechanical and which can be added and expelled at will. The chemical water of constitution of the clay is quite different, indeed.

Now, when a plastic clay is thoroughly dried, its loss of water from the point where shrinkage ceases is often very large—from 10 to 20 per cent. of the weight of the clay. What, then, is to be inferred from this? Obviously that the spaces between particles of the clay must, when added together, make quite a serious part of the volume of the clay. For instance, if a clay contained 20 per cent. of pore water and the clay had a specific gravity of 2.20, then it would be composed of 65 per cent. of clay and 35 per cent. of pore spaces, not taking into account the weight of the air in these cells. So we see that, entirely irrespective of the mineral ingredients of a clay, we always find quite a large proportion of its dry bulk is made up of air cells or pores, which communicate freely with each other.

Aron has also shown that the greater the size of the grains of the minerals and the less rich in clay substance the greater will this percentage of porosity be, while the greater the clay substance and the less of sand grains the clay contains the higher will its specific gravity be.

Now, when we burn clay wares, they have always, when they are placed in the kiln, this porous structure which we have just described. And as the heat rises in the kiln the loss of water from the pores becomes complete. Then, after the kiln begins to attain redness, the clay begins to change its chemical nature, and the loss of the water of constitution begins to take place. After the completion of the watersmoking, when the kiln has become full red in color, the clay will not have changed in volume, but it will have changed materially in weight.

This means that still further porosity will have been produced,

for, if water is expelled and no shrinkage occurs, it is evident that the clay must be more porous afterwards than before. In fact, if we take a piece of clay which has been burnt to this stage only we will find its porosity or cell structure greater in volume than at any preceding or subsequent point.

Now, let us investigate a little further the effect of a higher heat in the burning of the clay: If we put a number of small trial pieces in a kiln, and, after suitable watersmoking, we raise the temperature gradually, withdrawing pieces at intervals of an hour or so, we will note that their porosity begins to decrease rapidly as the heat rises, and, if the temperature is not driven up too fast, a point will be attained in most clays where the porosity has nearly altogether disappeared and where the ware will hardly absorb water in any degree; ink or other dark colored fluids will dry on the surface and leave no mark.

What has happened to our cell structure in this process? It is what in the trade we call vitrification, but which is really a process of incipient or partial fusion. The clay particles and sand particles are generally infusible by themselves, but, when heated with iron and other fluxing minerals, such as occur in nearly all clays, these two materials begin very gently to combine and soften. The cell walls thus break and fuse fast, one to another, and the inclosed air and gases are constantly and gently expelled by the rising heat and the loss of their old chambers, and the clay settles together, shrinking a second time under the action of heat, just as in the first time when the water was flowing out of it and its particles were approaching each other.

As the clay becomes more and more dense and less and less porous, its hardness, its strength and its toughness constantly increase, and all of these qualities arrive at their maximum together. At this stage all but the coarsest pores are closed up and eliminated and the few that are left are generally blind passages, ending with a cell wall and without communicating with other pores.

If, now, the heat be still further increased, what happens? The clay begins to soften as a whole, instead of in particles, and the combination between the particles of clay and lime and sand and iron becomes more perfect still, so much so, in fact, that the mass begins to act like a very stiff fluid, and begins to settle out of shape, even when it has no other weight than its own to carry. Lastly, if still more heat is used, the clay becomes a real fluid, flowing like a glass or glaze over its supporting objects.

Some clays, however, do not come to this kind of fusion until another stage has been passed through. In fact, only the limy and feldspathic clays do so fuse, while the great majority of ferruginous or red-burning clays, instead of fusing quietly to a glassy mass, puff up and swell into a veritable sponge, sometimes so light that it will float freely on water.

Here we have a new kind of porosity. The first porosity, which we saw was due to the spaces between the original particles of mineral of which the clay was composed, disappeared at complete vitrification, and this new cell structure only begins after complete vitrification. To what it may be due is still an open question, but we think we know some of its causes, nevertheless. Any gas generated in the clay during burning, after vitrification has taken place on the surface of the mass, will find trouble in getting out, just as carbonic acid gas finds trouble in getting out of a loaf of bread as it is rising in the pan. In fact, in both cases, the gases expand as the heat rises, and swell and puff up the tough, pasty mass inclosing them.

In brick clays the gases which can be present at these heats are few in number. Carbonic acid gas, sulphuric acid gas, steam and possibly oxygen will probably comprise the list. Whatever they may be, they all produce a cell structure very different from the first porosity of the clay. The cells are nearly spherical in form, and do not necessarily communicate with each other, so that the mass may be so porous as to float on water, yet it may only absorb a very small quantity into the interior of the mass, so that these two porosities must be kept clearly distinct and separate in the mind, as their effect and consequences are not at all similar. Having thus explained roughly that which I do not doubt all of you knew before, I will take up the next feature of the case.

Water, as you also know, when it freezes, undergoes at the instant of crystallization a sudden expansion of volume. It actually increases about one-eleventh in its bulk, and with such prodigious force does this expansion take place that nearly any object which confines it will be bursted. The old story of cannon balls, or shells, rather, being burst by freezing is well known, as also, I dare say, is the instance which our plumbing affords after a sudden or severe spell of weather.

Now, if a porous structure like brick or stone be filled with water and frozen, one of two things will happen. First, the water, expanding as it solidifies, will tear asunder the particles of the clay, crush in the cell walls which confine it, and, when the thaw ensues, will leave the material rotten and soft and useless for purposes of construction; or, second, the water, expanding in the pores, will meet such resistance from the cell walls that simultaneous freezing cannot take place, and the water remains fluid in part, though chilled several degrees below the freezing point. Under these conditions the internal pressure of the water is great, and it tends to exude from the pores of the clay all over the surface, and as it does so it generally solidifies into ice at the same instant and sticks out from the surface in millions of little needles or rods.

After thawing out, the clay in this case will not be perceptibly injured, and its strength will still be ample for the wear to which it is subjected.

That is to say, if any plastic clay structure is burnt to the right point it will have so few pores and its cell walls will be so strong that it is not possible for the water which it will contain to disrupt it in freezing. At least it does not do so quickly, though when

we think of the action extending over periods of time amounting to millenniums we are obliged to admit that nothing known to man can possibly stand unaffected by this simple but powerful force.

There is, then, practically speaking, for every clay, a point at which it will be impregnable to frost. Below this point we know that freezing will ruin the structure. The temperature and time required in burning clays to this point of safety is very different in extreme cases. Some clays, like the Albany slip clay, so well known to the stoneware potters, arrive at this point of safety at low heats, probably below 950 degrees C. Other clays do not sensibly fuse at even very high heats, but they gradually harden and strengthen till frost resistant.

No law can be laid down as yet defining the temperature necessary for a clay, even if we have its analysis, for the size and shape of the grain and the state of distribution of the fluxes may make very great differences in clays whose chemical analysis is quite closely similar.

But is this point at which the clay particles become so firmly knitted as to stand the strain of frost a narrow one? In other words, after this point is reached does the clay begin at once to become porous a second time, and thus become liable to destruction by freezing a second time? Here is another point of uncertainty which makes it difficult to judge of one clay by the actions of another. Some clays, like the Albany slip before alluded to, do not sponge up or become porous a second time, except when burnt in large masses and very quickly. Our common glacial drift clays often are calcareous enough to show a similar action; they pass into a black, glassy condition, and finally fuse and flow without sensible assumption of the vesicular stage. But a great majority of clays do not melt until after they have puffed up into a regular cinder or sponge, and this process is apt to start slowly and increase gradually, just as the loss of the first porosity begins and proceeds slowly by vitrification.

Between the point where frost safety is first reached and where frost safety is lost again by the gradual growth of the vesicular state, in good red brick clays free from lime, is a wide range of temperature, sufficient for all practical purposes in burning the ware. It may be in limy clays reduced to as little as 50 or 100 degrees, while in fire clays the distance may be extended to even 600 degrees.

This being the case, it would seem that there would never be any trouble in getting bricks past the danger line and stopping before they got into danger from too much fire or the vesicular structure which it produces. From whence, then, does all this popular idea come that frost resistance is a point which requires close watching in paving and other bricks?

I have so far based all my remarks on the idea that we were dealing with plastic clays, molded by hand into trial pieces and burnt as described. But in actual working conditions we often have to deal with clays which have been plastic once, but now are somewhat stony and hard in nature, and which we cannot make really plastic again without spending more money on them than is profitable.

All of our old or fossil clays, geologically speaking, such as the fire clay and shales of this State, are now only partially plastic. Many of them are so stubborn that we cannot work them without the use of at least 25 per cent. of soft, plastic, alluvial or glacial clays to help them out. Some of them, like the flint fire clays, are clearly non-plastic, and cannot be made so by any commercial means.

Now, when we make a brick from a shale or fire clay mixture which is not thoroughly plastic and which only runs through our machine dies by virtue of the plasticity of the bond clays we have used with it, the conditions which were described in the earlier part of this paper are but partly fulfilled.

To begin with, the pores are now much larger and the lumps of non-plastic shale are but poorly bound together by the plastic bond clay. Also, as the heat rises in burning, it often happens that the bond clay shrinks at a different rate from the shale, and hence bonds originally strong enough are broken by contraction in heating. Also, the shale sometimes will not stand the same temperature as the bond clay, and hence if one is burnt hard enough the other is apt to be spongy from overburning.

Under these conditions and others that all of you can picture for yourselves you can see at once that at a degree of porosity which would be well within the limits of safety of a soft, plastic clay brick, a stiff mud shale brick would perhaps be readily disintegrated by frost. Similarly, in a dry pressed brick, whose structure is purely mechanical, and in which no plasticity has ever been produced, each particle may be completely vitrified and nearly ready to swell, while no single grain will be attached to its neighbor by any bond but the proximity imparted under the enormous pressures of the die. Unless the grains actually soften and begin to adhere by reason of the plasticity due to heat we can hardly imagine dry press bricks as showing strong bonds when exposed to the action of frost.

These considerations make it very much more plain why a rather light red soft mud brick can often stand 12 or 13 per cent. of water and be frozen and thawed all winter without result, while a shale building brick, obviously much harder burnt, and stronger when tested by rattler or cross-breaking, will go down ignominiously with the first hard freeze. Also, when a dry press brick, burnt in a kiln of stiff mud pavers, so that every grain is clear beyond the point of dangerous absorption of water, will still fail if tested by frost.

It is therefore obvious that one cannot lay down arbitrary rules on this subject. We have seen that clays vary greatly in their frost resisting power at the same heats, or, rather, that very different heats are required to bring different clays to the point of immunity from frost, and also that the same clay will be very

materially affected in its frost resisting power by the method used in making it into merchantable wares.

Can limits be assigned to cover these various points? Not yet. Before this can be done some one must make a long and elaborate series of tests. So far but little really careful work has been done. I find a record made last year in the testing station of the Royal Porcelain Factory of Berlin, in which the writer, Dr. Hecht, shows that he obtained tiles which were frost resistant while showing a water absorption of as high as 18.5 per cent.

He further found that with each sample of clay tested the resistance to frost increased more rapidly than the percentage of absorption decreased. That is, tiles which burst at 22 per cent. absorption, when burnt at 850 degrees C., stood much better at 18 per cent. absorption, when burnt at 950 degrees C., and resisted frost perfectly at 15 or 16 per cent. absorption, when burnt at 1075 degrees C.

From this he draws the conclusion that the absolute porosity is a poor guide to the power to withstand frost, and that the real power to resist frost depends on the strength of the pore walls and the degree with which the various parts of the clay combine, rather than the degree to which the pores are closed up by consolidation of the mass.

In our present stage of knowledge we certainly know that water absorption is not a guide to the probable strength of the brick, unless considered in the light of a full knowledge of the clay used and the process by which the brick was made. For instance, if we know that a soft mud brick from alluvial clays absorbs 10 per cent. of water, it would be comparatively safe to assume it safe from frost. But if it were a stiff mud brick of the same clay it would be hardly safe to allow it over one-half of this per cent. of water absorption. If dry pressed from the same clay, 2 per cent. of water would be as much as I should be willing to see it absorb.

The most patent conclusion of all, however, is that to make any decisions at all of value on this subject a practical test must be instituted and the per cent. of safe absorption determined by actual trial.

To test a paving brick thoroughly in regard to this point I should take some green bricks, fresh from the machinery, and cut them up into sections of 2x4x3, or thereabouts. These I should burn, after careful drying, in a kiln up to a low red heat, or about 800 degrees C. Then, after cooling and opening the kiln, I should burn the tests, two or three at a time, in a small test kiln, temperatures as follows: 950 degrees C., 1000 degrees, 1050 degrees, 1075 degrees, 1100 degrees, 1125 degrees, 1150 degrees. The bricks from each set, after measuring their hardness, I should then soak, and, after determining the per cent. of water absorbed, freeze hard for several hours. After two or three freezings the bricks standing the test would clearly show for that clay and that kind of machinery where the limit of safety stands.

In regard to paving bricks now in the market made by the stiff mud process it can be truthfully said that practically no soft material is seen. The tendency is on the side of overburning, and many a thousand bricks are laid whose cindered, weakened structure is sure to fail under abrasion and frost from too much rather than too little fire.

The stand taken by the Paving Brick Commission is a bold one and in the face of all common opinions on the subject. But not only did all their work on the subject of absorption and loss by rattling fail to show any relation existing between these two tests, but the united experience of all the members could not develop a case of a paving brick failing by frost which could possibly have stood an ordinary rattler test. For that reason the commission decided to make one test the real test and abandon all others as immaterial.

Hearty applause followed the reading of this paper, which the President announced was open for discussion.

Mr. Darnell: I have seen it demonstrated that the frost will affect a machine made brick much quicker than a soft mud brick. I never could understand why it was, but suppose it is because of the difference in construction of the brick. I would like now to ask Professor Orton about his cones—what success he has had with them in burning.

Secretary Orton: I would be glad to tell the Convention anything they may want to know about those cones, but this is hardly the time. The cones are simply a means of perfecting the burning to any temperature at which it is desired to stop. How many have noticed the difference between the point at which a soft mud brick and a stiff mud machine made brick will stand frost? Or have you ever noticed that one will stand more water than another?

Mr. Darnell: I have.

Secretary Orton: Up to two or three years ago I had absorbed most of my knowledge along this line from paving-brick makers, and I had been educated to think that if one knew how much water a brick would contain he had all the data needed to tell its strength. About that time somebody called my attention to a soft mud brick which had been lying out all winter and had not been hurt by the frost, and which would take between 10 and 11 per cent. of water. Since then

I have found out the facts set forth in this paper.

Mr. Darnell: Why will a drain tile stand frost better than the brick made on a stiff mud machine and burned to about the same hardness? I know that to be a fact.

Secretary Orton: I cannot answer that question.

Mr. Halbeisen: I have observed that a drain tile which has been under ground, excluded from the air, and which was very soft, might freeze there two or three winters and remain in its natural condition until uncovered and exposed to the air, when it would collapse.

Mr. McClure: I would like to know how Mr. Darnell knows that his brick and drain tile had been up to the same degree of heat? Upon what basis do you form your opinion?

Mr. Darnell: When I burn it in the same kiln and with the same fire I never have trouble with the tile, but with the brick I do. My theory is that the clay is pressed more solid in the tile, owing to the core in it, than it is in the side cut brick. I notice with the hollow brick I never have the trouble of spoiling from frost, but the solid brick will not stand the frost.

Mr. Rumsey: Mr. President, I will say that I have been making the hard pressed brick, the stiff mud brick, and I had to quit manufacturing them. They would laminate and go down, while the tile, made from the same clay, from the same pit, would stand. I went to making soft mud brick with the Martin mill, and am making them successfully.

Mr. Darnell: You used a lubricating die?

Mr. Rumsey: Yes, sir.

No further remarks being forthcoming on the subject under discussion, the following paper by Mr. Geysbeek, of Zanesville, was read by the author:

DIFFERENCE BETWEEN POTTERY BODIES AND COMMON CLAYS.

Thinking that the subject of "Pottery Bodies vs. Common Clays" will be of some interest to the brick and clay manufacturers here present, I invite your attention for a short time to a paper prepared on those lines.

Nature supplies the body, both for the brickmaker and the pottery man, the difference lying in their selection and method of preparation. The question that clay men generally ask themselves when they contemplate starting up in a clay line new to them is, "What clay shall I use?" and in the majority of cases the answer is, "Well, let us try this, that or another clay." They hardly know how to try, and their experiments are made in a haphazard way. Generally they try for the color, and perhaps for the heat the clay requires, very seldom taking notice of the plasticity, shrinkage and the way in which the clay behaves during the drying process.

Many thousands of dollars could have been saved in the clay business of this country if the inexperienced would-be pottery man or brickmaker had asked advice of some person experienced in the line of business in which he expects to embark, or had sent his clays to some practical chemist and had a thorough physical and chemical test made. But they generally say in answer to the first, "We can't get anything out of the pottery man." In any case, by making use of a good chemist you will, in the end, save yourself a great amount of worry, time and good American dollars.

In selecting clays for brickmaking or compounding a pottery body the very first thing to be done is to make a thorough selection of the material which will be used. For brickmaking the tests are taken over the whole area of the new clay bank; for pottery bodies these tests are made with different samples, which are obtained from the dealer in pottery raw material. When a clay will not stand a thorough test it will never pay to use it for any purpose. After the samples are taken, a thorough investigation is made as to their value. A test is made to show its plasticity, its toughness, its shrinkage, its behavior in the burning, its color after the burning and for its physical and chemical qualities. If a chemical and rational analysis is made of the clay to be tested it will assist very much the investigating parties. The chemical analysis will be of more benefit to the brickmaker, while, on the other hand, the rational analysis will be of more value to the potter. The chemical analysis will tell the brickmaker how much iron, flux and other ingredients his new clay contains—if it is high or low in silica and alumina. The rational analysis divides the clay into clay substance, sand or quartz and flux, and from that the potter can better judge if the clay is valuable to him or not. But it always must be understood that both parties know how to appreciate the value of these analyses, and just there I strike a very weak point in the minds of both.

The value of analysis to the ceramic industry in the United States is not generally understood and is not what it should be. A great deal of money is annually lost through small leaks in the starting points of the clay business, which, if the clay men in general would understand better the benefit of physical and chemical advice, could easily be saved.

After having tested the clay on its different qualities, the next thing to be done is its mixing, in case this is necessary. Here, again, the value of good understanding is of importance. By

chemical or rational analysis it is easy enough to mix two different clays so that they will be suitable for the purpose required. Of course, trying and finding out is a good plan, but it takes time and money and is less practical.

Having given now some points about clays in general, I will come to the subject proper of this paper—the difference between pottery bodies and common clays.

The difference between these two is very great, as everybody knows. Good brick clays will never make a good pottery body, and a good pottery body will never make good paving, building brick or tile. The brickmaker has to deal with clays which he finds in nature prepared, while the potter must prepare his body just to suit his needs. Speaking of potters and pottery bodies in this paper I do not include the red ware, yellow ware and stone-ware potters. They find their clays, like the brickmaker, in nature, and it is only through a more careful preparation of their material that they obtain their bodies for manufacturing purposes. But potters who make white ware, C. C., white granite, semi-porcelain, hotel china and porcelain cannot find in nature a clay which will serve them directly for working purposes. In some parts of China and Japan, however, we find small veins of such bodies which can be used directly for pottery purposes, but these are exceptions to the rule.

A brickmaker who selects a clay for his purpose has to look first after the color to which his clay will burn. Iron, which gives him the best color, is, therefore, welcome to him. Iron is objectionable to a potter, and he has no use for it in his body. Iron will color his white body yellow, will give black spots and specks, and gives his white ware an appearance of dirty clay.

Mica in clay is, to a certain extent, bad for both; however, the brickmaker will care less for it than the potter.

Lime and magnesia are found in small quantities in nearly all clays. When present in the form of pebbles they do great harm, but otherwise their effect is not noticeable.

Organic matter is frequently found in natural clays, but is of no importance.

PREPARATION OF THE BODIES.

Common clay is dug from the hill or bank, or it is mined and brought to the factory, where it is ground in dry pans, sieved through large screens, prepared in a wet pan, and run off by certain means to the brick machine or press, where it is formed into brick, pipes or tiles. This way of preparing a body is quick, and with a little experience on the part of the man who does the tempering everything goes all right.

The potter, however, cannot prepare his body in such a short way. His clay ought first to be brought in a liquid state in order that he may be able to sieve it through a very fine screen or sieve to purify it from all dirt and sand, which are objectionable for his purpose.

The potter uses, in preparing his bodies, different ingredients—kaolin, ball clay, Cornish stone, feldspar, flint, or quartz and whitening. The ingredients are weighed or measured out, put into a big tub, called "blunger," and mixed with water and blunged into a thin slip. This slip is run through a shaking screen. The sieve in use varies from 60 to 120 meshes to the inch, according to the impurities the clay may contain and the fineness of the ware which is to be manufactured from it. The slip which comes from the shaker is run into a cistern. From there it is pumped to the filter press. A filter press is a machine, as its name already tells, by which the water is filtered from the clay under pressure. A filter press is composed of a number of chambers, which are lined inside with heavy canvas, through which the water is pressed, and by which means the clay remains back. The clay forms cakes, which are taken out as soon as the press is full. These cakes are then worked up in a pug mill to the right consistency necessary for shaping the clay in the molds. When the Association visits our factory, the J. B. Owens Pottery Company, I will, in a more practical manner, explain to you the different processes which are used in making pottery bodies.

The difference next in common clay and pottery bodies is in its handling while the ware is manufactured. The brick are run off the presses, put on the trucks and put in the driers, the pipes and tiles on dry floors. The handling of the same requires little skill. In pottery bodies the clay is put in plaster paris molds, on turning wheels or jiggers. The molds give the ware the outside shape and the "shoes" the inside shape. The ware which is formed in this way is taken out of the molds and put on boards to dry. Afterwards it is finished up with sponge and knife and ready to be burned.

The drying of both pottery and common clay ought to be done with great care. One clay will stand more heat in drying than another, owing to the difference in their physical properties. Some systems may be all right for one clay which would not be suitable for another.

The burning of the wares is the next step of the process. Both pottery bodies and common clays are burnt in kilns. The kilns in use are quite different from each other, although the system is the same. In both of these branches of the ceramic industry up and down-draft and continuous kilns are in use. The up-draft kiln prevails in potteries. In our factory we use both systems, up and down-draft, and the results are in favor of the down-draft. The continuous kiln for pottery purposes has, as far as I know, not been introduced in the United States, but in Europe we find several potteries where such a kiln is in use. Down-draft and continuous kilns are mostly used in the brick and tile industry.

The setting of the kilns is different. Ware made of common clay is set open in the kiln and is subjected to the smoke and coal dust and to the influence of the kiln gases. In pottery ware, however, we cannot set the ware open in the kiln. The ware, there-

fore, is burnt inside boxes, made of fire clay and grog, which are called "seggars." The seggars are set in rows, one on top of the other, in the kiln. Necessary room is left for the gases to escape and to assist the draft. The greatest difference in pottery and common clay is that the former are burned twice and the latter, with some exceptions, only once. The first burning of pottery ware is called "biscuit" and the second fire "gloss," or glaze burn.

Pottery ware and such made of common clay are usually burnt by trial. However, in some establishments the system of burning by Seger cones has been introduced, and has proven to be far superior and more accurate than the trial system.

The heat by which pottery bodies and common clay are burnt is very different, and depends mostly on the ware which is manufactured from it.

The way of handling common clays after they are burnt is quite different from the handling of pottery bodies. Pottery bodies are to be handled more carefully, as the ware is much finer than that which is manufactured from common clay. Brick, tile and pipe are usually shipped direct from the kiln after drawing, with only a few exceptions, as fancy building brick, glazed brick and terra cotta.

Pottery ware is packed carefully, is shipped in boxes or crates, and the breakage of the latter is far greater than common clay goods.

Taking all things into consideration, we find that the manufacture of pottery ware requires more experience and closer attention to its manufacture, handling, burning and so on than common clay ware.

However, these two branches of ceramic art, the common clay industry and the pottery industry, require both a great deal of practical, scientific knowledge and experience, and a good brick, tile or sewer-pipe maker stands just as high in the ceramic industry as a good and practical potter.

The evident interest with which this paper was listened to was shown by the close attention during the reading and the applause following its close. The President's invitation to a discussion of the subject at first brought no response, the matter being out of the usual line of subjects discussed by the Association.

Mr. McClure: This is an excellent paper, and if there are any pottery men present it ought to be discussed. It is foreign to the rest of us, but we would be interested in hearing a discussion of the subject.

Mr. Wilson: When a subject is treated as fully as that has been, and with the amount of intelligence which that conveys, the ground is fully covered in every sense, and I do not see what is left for us to say. Like Mr. McClure, I have nothing to offer, because the paper is full in itself, but it is one we should like to have to refer to if it is published.

Mr. Darnell: There is one thing I want to hear about, and that is Seger cones. They are mentioned in this paper, and I think that burning by cones is the only true way to burn.

PYROMETRIC CONES.

Secretary Orton: I am actually ashamed to rise again to speak, but Mr. Geysbeek brought out points in his paper which I think it eminently interesting for this Association to consider. I remember some time ago, before I began the special study of clay industries, a pottery body seemed a marvelous thing to me, and altogether different from the clay with which we are all so familiar. Mr. Geysbeek shows us a very close relationship existing between the potter's body and the clays which the rest of us deal with; and this, perhaps, is more clearly visible when we come to handle the two substances, side by side, in the rational analysis. When investigating a natural clay by that process we find we can separate it analytically into clay substance—that is, "real clay," sand and fluxing matter. When we take white ware or china body, if, by hook or crook, we can obtain a piece from the man making it, and submit it to the same test, we find it will separate into the same things. It mainly differs as to color. For instance, I have had occasion to examine stoneware clays chemically, and also had occasion to examine white granite bodies. I can turn to the pages in my note books where I can see the compared analyses of these two things, and if I would hold a piece of paper over the line showing the percentage of iron I do not believe there is a man here who could tell which is which. A good stoneware body and a good white granite ware body have almost identically the same percentage composition, except that stoneware contains more iron than the other. If that is so, there is not so much mystery about a potter's body after all, and when we

come to investigate the way the potter makes his body and investigate the way the natural clays are grown in the hill we are bound to admit that the potter is only doing for himself, in a clean, workshop manner, what nature has done by exactly similar methods. The potter buys from the dealer white china clay and ball clay, which is more plastic than china clay. He finds they are too shrinking in nature to use alone, and he buys fine white quartz or sand, crushed to a powder. He finds the body mixed from these two substances is too dry and does not harden properly, and he buys white feldspar, crushed to a powder, and puts it in for a flux. He has clay substance, quartz and fluxes. What do we find in nature? We find in every common clay, when we examine it, first, clay substance; next, we find sand, which is quartz; lastly, we find different minerals which act as fluxes, largely feldspar supplemented by iron, some lime and sometimes magnesia, and occasionally other things. Nature has prepared this mixture by millions of tons and laid it down in the hills, while the potter mixes his clay in a batch of a ton at a time in the blunging tub. We ought to feel much indebted to Mr. Geysbeek for bringing this out, and it ought to make some of you potters feel a little bit more charitable when you have to talk to brick men, if we have this common basis for our business. In answer to what Mr. Darnell has inquired about, since he seems desirous of getting some information in regard to this subject, I would say that last year, when we held the meeting at the University, I gave you some little talk on the subject of measuring heat by the process of Seger cones. I also showed you some of the cones, and how they were melting by heat. I do not know that I can add anything to what I told you at that time, except that since then I have made more general use of the cones and the University has taken up the manufacture of them in a small way and is trying to introduce them generally among pottery and clay men throughout the country. We think, with good reason, that it is by all odds the simplest, readiest and most accurate means of controlling temperature. For instance, in making the tests mentioned in the paper read to-night the temperature was controlled by consecutive numbers of the cones. I take a cone which melts at the point desired and put in with the test. If I burn it until the cone is melted I know that it has had that temperature. If I want 50 degrees higher I take the second higher number in the series. The difference in temperature by the eye would be very hard to distinguish. So other ordinary tests, as cutting with a knife, looking at the ware or testing with the tongue to see how it sucks water, and so on, are not accurate or satisfactory. But in using the cones one has simply to look into the kiln and see whether the cones are standing or have gone down. If they are down, you will know the temperature has reached the point represented by the cone. It is such a simple, convenient and accurate way, and affords such excellent opportunities to compare results. If one man is getting effects that another man wants, and the first is willing to impart his knowledge, the cones make it possible to give a clear understanding to the other. The University has undertaken the manufacture and sale of these cones, not for the purpose of making money, but with the idea of introducing them for the good and help they will yield to clay-workers. The price at which they are sold barely covers the cost of the cones, certainly not over 10 per cent. more than the cost of production—nothing more, indeed, than to insure us against possible loss. They cost about a cent apiece to make them on the scale we make them now. If a potter has four peep holes in his kiln and uses three in each peep hole, it would cost a mere bagatelle, and I think any one can illustrate for himself that their use can be made satisfactory by giving them a patient trial. Does this answer your question, Mr. Darnell?

Mr. Darnell: Yes, sir.

President Bigelow: We will proceed to take up the questions in the question box if there are no further remarks. The Secretary will read the question.

A Member: I will ask, first, whether your cones can be used in burning common drain tile?

Secretary Orton: Yes, they can be used in burning anything. All that is necessary is to set them where you can see them during the progress of the burn. One man might set them where they would get the highest heat and another man where they would get the lowest heat. The success of the system depends upon always doing it the same way to get consistent results. It is simply a development of the trial pieces which you use. These cones are simply trial pieces, made to melt at certain heats, instead of being taken out to look at. They are always made in the same way, of the same materials, and will melt at the same temperature in each burn.

THE QUESTION BOX.

The first question is: "Can Hollow Block, 8x8x16, Be Repressed and Then Dry Straight?"

Mr. Wilson (after a long pause): Nobody seems ready to answer that question, and I think it is a question which is a little difficult to answer. I never had any experience with repressed hollow block, and never saw a press made for that purpose, yet I do not know why it could not be repressed, and I see no reason why it would not dry straight if it was repressed. It might conflict with the shape of the inside, but still leave the chambers large enough.

Mr. McClure: I asked that question, and am interested in getting an answer, if possible. I do not expect an answer from anybody's actual knowledge, but I would like to have the opinion of practical men, first, as to whether it is practicable to repress them, and, if so, whether the greater pressure on one side than the other will cause the one side to dry slower and warp it.

Mr. Eudaly: What you want is to repress to make ornamental block?

Mr. Wilson: The American Clayworking Machinery Co. makes a roller ornamental process machine, which requires a slight pressure to make the indentations as it rolls from the machine. I have never seen the operation, although I have thought we might get one when the demand would justify the expense.

Mr. McClure: Can you get it when you want it?

Mr. Wilson: No—

Mr. Darnell: I guess Mr. McClure does not want to pay that half-cent royalty.

Mr. McClure: I want to know if every one can get one of those machines? I do not think every one can get them if they want them.

Mr. Warstler: That can be had by any one outside of a special territory in which the license to manufacture has been sold.

Mr. McClure: That is why I am interested; I am in that territory.

Secretary Orton: The next question is: "What Is the Best Way to Set Hollow Block in the Kiln so that It Will Burn Straight?"

Mr. Eudaly: I would not set it at all. I would stand it up.

Mr. Darnell: I guess Mr. Eudaly has answered the question. There is only one way to set it to keep it from checking, if you put any number in the kiln. You can lay one or two rows down on the side like a brick, but if you put any weight on them the lower blocks are going to separate and crack. If you burn them on end you will get a uniform color and no loss in burning. I have tried both ways and abandoned the first. At Westerville they burn on the side, but you will find there any amount of cull blocks.

Mr. Wilson: The reason I asked the question is that my experience has been that it is best to burn them on end, though I have experimented a little with setting them sideways. I visited the Westerville works last fall and observed that Mr. Everal was burning blocks, 16-inch, setting them on the side, but I noticed that his cull pile was large. I do not know whether it was the fault of burning them that way, or the pressure in the die, their length, or what; but I thought he had most too many culls.

Mr. Darnell: I will say for Mr. Everal that he cuts his

blocks by hand, which any one knows cannot be done accurately. Of course, they cannot be set on end unless just exactly the same length. I use a patent cutting table, and it cuts every tile just alike, and there is no trouble to set them in the kiln. There is not an eighth of an inch variation in the tile or brick. They are cut square and have no finger marks on them; the operator does not touch his fingers to the sides at all.

Mr. Wilson: What do you lubricate with?

Mr. Darnell: Cold water. I have it on the third floor to get the pressure. When I first went to making blocks I thought steam was the right thing, and so it was with the clay I was then using. But with the clay I am now using I cannot use steam at all. The die heats and the clay rolls up. I use a barrel at the third floor and a pipe carries the water down to the die. I do not use over two gallons a day, making two thousand blocks—not a big factory. I sell for \$25 a thousand, cash. I have to compete with two hand-made-brick yards.

Mr. Halbeisen: When you used steam as a lubricator did you use it hot or condensed?

Mr. Darnell: I used about twenty feet of steam pipe; it was condensed to some extent.

Mr. Mentzer: I have had some experience in making hollow block. I made nothing else all last summer, except one kiln of tile. I found the best way to burn them is to burn in twelve-inch tile, putting four in each tile. The hull on the tile and the hull on the brick are the same thickness. Burning inside the tile, I hardly ever spoil a brick. I put the last courses on top of solid brick, placing them just so they do not touch. We lay the floor with hollow brick about four inches apart. It is a tight floor. We cut differently from the manner which has been described. We use a side-cut brick table and use steam as a lubricator.

Mr. Wilson: In regard to your steam lubricator, how long is your pipe to the boiler?

Mr. Mentzer: Fifty feet. We just turn on a little steam. We shut it off at the boiler and turn the valve just so the steam will work through.

Mr. Bigelow, Jr.: Has any one tried to work without a lubricator? We work without a lubricator, and get smooth, nice brick in every way.

Mr. Balmot: We have been making hollow blocks for many years at Louisville, and I never heard of lubricating the dies for hollow block. We make ten a minute, and never think of the dies getting warm. We have the clay thoroughly pugged and find no trouble. Our people universally stand the block on end to burn, make 16½ inches in length and burn five courses high in the kiln. We fill the kiln throughout with blocks, but burn small size drain tile inside the blocks if we want to. Burn two-and-a-half, three or four-inch tile inside the square blocks and they pay for the kiln.

Mr. Wilson: Do you use an auger mill?

Mr. Balmot: Yes, sir.

Mr. McClure: What do you glaze with?

Mr. Balmot: A salt glaze.

President Bigelow: If there are no further questions we will listen to the reports of the Secretary and Treasurer.

Thereupon the Secretary read his report and that of Mr. Hagy, the Treasurer, who was unfortunately ill and unable to be present. The reports were ordered accepted and filed.

ELECTION OF OFFICERS.

Report of Committee on Nominations being called for, Mr. Endaly, as Chairman, reported that President Bigelow had refused to allow his name to be considered for renomination, as also had the past Treasurer, Mr. Hagy, in emphatic terms. Therefore, they recommended the election of the following named officers:

President—Ed F. Darnell, Grove City.

Vice President—J. D. Rumsey, Stryker.

Secretary—Prof. Edward Orton, Jr., Columbus.

Treasurer—W. B. McClure, Warsaw.

On motion of Mr. Endaly, seconded, the rules were suspended and the President instructed to cast the ballot of the Association for the officers recommended by the Committee on Nominations.

President Bigelow cast the ballot as directed, and declared the above named officers elected.

Mr. Endaly was chosen to install the newly elected officers, which he did in his inimitable manner, his remarks and the replies of the officers creating great good humor among the audience.

The Committee on Change of Constitution reported, recommending the following changes, which, upon motion of Mr. Endaly, were adopted. The report was read by Mr. Long, Chairman:

CONSTITUTION AND BY-LAWS.

Article I. This society shall be known as the Clayworkers' Association of Ohio.

Art. II. The annual meeting of this Association shall be held at such time and place as the Executive Committee may determine.

Art. III. Any person identified with the clay industry, either as a manufacturer of clay wares or an employee of a clay works, or a maker of any machinery or appliances used in the clay industry, or any person associated with the technical publications or schools devoted to the clay industries, shall be eligible to membership in this Association, and shall be entitled to all its privileges on payment of the annual dues and registration by the Secretary.

Art. VI, Sec. 2. The officers of the Association and the last preceding ex-President shall constitute the Executive Committee.

W. A. LONG,
ED F. DARNELL,
FRANK HALBEISEN,
Committee.

Upon motion the Secretary was instructed to send to the Zanesville Board of Trade, through its President, Hon. E. M. Ayers, a copy of the following resolution:

Resolved, That the thanks of the Clayworkers' Association of Ohio are hereby most cordially rendered to the officers and members of the Board of Trade of Zanesville for the use of the Board of Trade Hall, which was freely furnished at a time when its occupation involved some sacrifice on the part of the board, and also for the elaborate arrangements made for the entertainment of the Association while in the city, and for the very cordial welcome extended to them during their stay.

Also, on motion, the Secretary was instructed to send copies of the following resolution to Mr. C. M. Bennett and Mr. Samuel Wade, of Zanesville:

Resolved, That the cordial thanks of the Clayworkers' Association of Ohio are due to Mr. C. M. Bennett, of the Cincinnati & Muskingum Valley Railway, and to Mr. Samuel Wade, of the Columbus, Sandusky & Hocking Valley Railway Company, for the delightful excursion over their respective lines to the great clayworking establishments of Zanesville and Roseville. The Association wishes these gentlemen to know that it appreciates to the full not only the public spirit and ready interest in technical affairs of their respective corporations which caused them to proffer such a trip, but also the extremely efficient and skillful manner in which the affair was handled, thus making it possible for so large a body of people to inspect in comfort and ease such a large number of diversified industries in so short a time.

Also, on motion, the Secretary was instructed to send copies of the following resolution to the various firms who joined with the Board of Trade and railway companies in making their stay at once so instructive and agreeable:

Resolved, That the thanks of the Clayworkers' Association of Ohio are hereby rendered to the officials of the American Encaustic Tiling Company, the Mosaic Tile Company, the J. B. Owens Pottery Company, the South Zanesville Paving Brick Company, the Roseville Press Brick Company, the Roseville Paving Brick Company, the Midland Pottery Company and the Roseville Pottery Company for the warm welcome extended to them on the occasion of their visit to these respective plants; and also to the T. B. Townsend Brick and Contracting Company, the A. O. Jones Brick and Terra Cotta Company, the Oakland Pressed Brick Company, Messrs. W. B. Harris & Bros., the S. A. Weller Pottery Company, the Zanesville Stoneware Company, the Mercer Pottery Company and other clayworking establishments whose invitations to visit their plants were received, but which, on account of time, could not be formally accepted by the Association.

Also, on motion of Mr. Ashby, a vote of thanks was tendered the retiring officers for their work in behalf of the Association, with special mention of the Treasurer, Mr. Hagy, who has served the Association so faithfully for many years.

Thereupon an adjournment of the business session was

taken, the members of the Association to meet Saturday at 7:30 a. m., at the C. & M. V. Depot, for the excursion arranged by the Board of Trade.

VISITING ZANESVILLE'S CLAY MANUFACTORIES.

Promptly at 7:30 Saturday morning the excursion train of two coaches, furnished through the courtesy of Mr. C. M. Bennett, of the C. & M. V. Railway Company, and under his personal charge, pulled out from the depot, bearing a full representation of the members of the Association and quite a gathering of the Zanesville clayworkers.

It was agreed by all that it would be best to proceed to the furthest point first and return to the local establishments later in the day, so that those who wished could drop out for early trains. Accordingly the first stop was made at the plant of the Roseville Pottery Company, situated in the pretty little village of Roseville, about nine miles out from Zanesville. The officers of the company were promptly on hand to usher the excursionists through. The output of this concern, which is the pioneer in its line, consists of earthenware goods, largely decorated with unfired paint. Their methods of manufacture are modern and their output large. After a pleasant half hour the train pulled up and the excursion proceeded to the plant of the Midland Pottery Company, an extensive concern, in the north end of Roseville, making a specialty of stoneware cooking utensils.

On disembarking, the managers, Mr. McCoy and Mr. Cole, stepped forward and conducted the party through their plant. The ware of this establishment is made largely from a very silicious clay, which presents the appearance of a sandstone. By careful grinding, however, a body is secured strong enough to resist hard usage and porous enough to resist rapid changes of temperature on the top of a stove. The glaze is Albany slip, and is absolutely impervious to liquids.

At 9 a. m. the train conveyed the party to the plant of the Roseville Paving Brick Company, into whose works the cars were backed. The genial Manager, Mr. Myers, was on hand promptly, and showed us rapidly, but efficiently, through the plant, calling attention to the striking features of the same. The use of the waste heat in drying is especially noteworthy, being the only establishment in Ohio making use of this system. The same plan is very generally adopted abroad.

All too soon the bell of the engine warned us to get on board. Our next stop was made at the large establishment of the Buckeye Pressed Brick Company, about a mile north of Roseville. This plant is situated on a private switch about a half mile from the railroad, and presents an imposing appearance against the hillside, with its numerous kilns and buildings.

On first reaching the plant the extensive stock sheds were visited, where we saw the various lines of brick of which this company makes a specialty. Passing through the kiln yard, where the distinctive type of the kilns was made the subject of special notice, the party proceeded to the factory, and, lastly, to the clay bank on the hillside above. The clay vein here worked is about twenty feet thick, of a soft and plastic fire clay. From other veins near by they obtain the material for making first-class "speckle" brick. Before we left this establishment it became evident that Mr. Ashby could no longer be restrained from taking a photograph. The party, therefore, draped themselves artistically on the hob of a down-draft kiln, all of the homeliest ones in the most prominent positions, and "looked pleasant." After this operation we re-embarked for South Zanesville.

The only clay plant in operation at this point now is that of the South Zanesville Paving Brick Company, of which Mr. John S. Bolen is the Manager. After a short stop, since the factory was not running, we proceeded to the Mosaic Tile Company.

Up till this time we had been traveling on the line of the C. & M. V. R. R. Co. altogether, but we now were switched over on to the Belt line tracks, under the care and pilotage of Mr.

Samuel Wade, who looked out for us royally while on his dominion.

On reaching the tile works we were ushered at once into the store and packing room by Mr. Mueller, the Superintendent. Mr. Mueller had kindly set up a number of very fine exhibits of his ware in anticipation of our visit. Among these a large panel to be used in the mural decoration of a brewery was the most striking and beautiful. No attempt can be made to describe the numerous excellencies of this unique establishment. Its processes and its results belong distinctively to it, and will doubtless receive a much fuller mention elsewhere than can be now accorded to it. One thing which especially awakened the interest of the clayworkers was the sight of the well-equipped chemical laboratory, which, in this plant at least, has been made the regular means of securing technical control of their work. On departing each visitor was given a souvenir tile.

The next stop was at the J. B. Owens Pottery Company, where we were met by Mr. Owens and Mr. Geysbeek. The original product of this plant was similar to that of the first establishment visited, consisting of painted earthenware. Later, however, they have embarked in the manufacture of glazed jardinières and fancy articles, and are now engaged in bringing out a brand new line of art pottery, which, judging from its appearance, is destined to make a hit.

By this time the morning had flown, but it was decided to push on and make one more stop before returning to Zanesville. Accordingly, the railroad officials were requested to take us to the works of the great American Encaustic Tiling Company, located a mile or two north of Zanesville. Arriving here just as the employes began to work after the dinner hour, we were shown through department after department, until there was no room left for fresh surprise. Although we walked constantly, we were on foot nearly an hour and a half, and then felt as if we had just begun. The glazed ware of this establishment was a marvel of beauty, there being practically no limitations to the variety of the decorative effects obtained. Their color card alone contains seventy-two shades, and when to this is added the use of gold and the skillful blending of tints by their corps of trained artists, it will be seen that no one-hour trip was adequate to gain even a faint conception of the capacity of this plant. The impatient tooting of the engineer's whistle called us reluctantly together again, and one-half hour later we were shaking hands and saying good-bye at the Zanesville depot once more.

It is but fair to say that the Zanesville Board of Trade were only half through with us when we had to stop. They had projected a continuation of the trip to the brickyards and other plants on the east side of the city, and were determined to take us there, but owing to the time schedule of trains leaving Zanesville a majority of the members of the Association had to leave early, and the trip was reluctantly abandoned.

The new feature of the work of the Association was most auspiciously begun in this excursion. Many of the members found the experience entirely novel, and its great value as an aid to the work of the Association and a means of self-education were at once appreciated. It is safe to say that it will become a permanent feature of the work of future Conventions, though it is by no means sure to fall into the hands of such genial and efficient conductors or to visit spots so replete with attractions as Zanesville.

A GOOD EXAMPLE.

Publishers Clay-Worker:

Inclosed please find check for \$2 for Clay-Worker for the year 1897. We took advantage of the dull times and added new kiln, new boiler and sander to our plant, and are now ready for business. We put in a Monarch machine two years ago, and are well pleased with results. We could not do without the Clay-Worker, and wish you the best of success, which you certainly merit.

DALTON BROS.

The Nebraska Brick Manufacturers Association

THE FAITHFUL pioneers of progress among the brick-makers of Nebraska, weak in numbers, but strong in enthusiasm for all that stands for advancement in clayworking, assembled the second time in Annual Convention, Tuesday, Jan. 19, in the audience room of the Capitol Hotel, at Lincoln. President George F. Cotton, of Table Rock, called the Convention to order, bade the newly enrolled members a cordial welcome and addressed the Convention as follows:

PRESIDENT'S ANNUAL ADDRESS.

Gentlemen of the Convention:

One year ago a few brickmakers gathered in this hall, and, although the past had been almost disastrous, the present and the future looked dark, they still had courage and hope.

In organizing, your humble servant was chosen President, an honor which I consider far greater than would be given under ordinary circumstances.

When the clay industries were all making good profit on their output, then most of us could say, "All hail to the clay industry!" On the contrary, when we see what little we had accumulated in years previous slowly but surely going to balance our ledger, then is when it tries men's souls.

Now, gentlemen, if you will bear with me for a few moments, I should be pleased to advance a few ideas and recommendations for the Convention of this Association, which, in my opinion, will adjust matters both with the citizens of our State and the clay industry.

The price of brick has been reduced to such an extent that the manufacturers are compelled to make more in number in order to make their business a success, hence the question arises, How can we double our sales?

Our duty is, first, to try by every possible means to improve the quality of our ware; second, the hollow block question should be carefully considered, and plans for dwellings and the cost of same should be submitted and published with our proceedings, and mailed to every farmer in Nebraska.

I hear some of you say: "Who will furnish the money for this?"

In answer I will say that our legislators are now in session, are able men, and all feel interested in the welfare of our great State.

It is my judgment that this humble body will appropriate \$1,000 each year for the term of two years for the purpose of printing and distributing these proceedings and figures.

It is our duty as brickmakers to show plainly that Nebraska can furnish her own building material at the same cost as wood, thereby furnishing more of our citizens with work and keeping our money within our own State.

The clay industry is merely in its infancy in Nebraska, and I look forward in great faith that at no distant day brick dwellings will dot our broad prairies from the Missouri river to the Colorado line.

Now, brethren, let us be broad-minded with each other, and try and promote each other's interests, as well as the interest of the people where each one of us is located.

I feel gratified that so many of our fellow-craftsmen are here with us to-day, when we consider the fact that only a few of the brick plants in Nebraska have been running the last year and money so hard to get, but remember the old adage that "it is darkest just before day." While our cities will not likely do much paving in new districts, they will be compelled to repair some of

their streets which have been paved with cedar block; this will in itself help us out; besides, there is no brick in stock. In fact, the future looks bright for us.

I will close by saying that I hope every member here may be benefited, and that we may all feel well repaid for our attendance. (Applause.)

REPORTS OF COMMITTEES.

The President's address was listened to attentively, and at its conclusion reports of committees were heard and approved, including that of the Committee on Legislation, which stated that a bill had been formulated and put in the hands of Representative Clark, who had promised to use his best endeavors to get it through the Legislature. The bill reads as follows:

Be it enacted by the Legislature of the State of Nebraska:

Section 1. That there be and is hereby appropriated out of the general fund of the State the sum of two thousand dollars (\$2,000) with which to defray expenses of printing the proceedings of the Nebraska Brick Manufacturers' Association, and to further print and circulate general information regarding the brickmaking industry of the State of Nebraska.

Sec. 2. The appropriation hereby made shall be in full for the two years ending Jan. 15, 1899, and the said sum of two thousand dollars (\$2,000) shall be paid out of the State Treasury upon the presentation of vouchers duly itemized, shown to and approved by the Board of Directors of the said Nebraska Brick Manufacturers' Association.

Sec. 3. Whereas, an emergency exists, therefore this act shall be enforced from and after its passage.

The Convention then adjourned until Wednesday morning.

SECOND SESSION.

The Wednesday morning session was called to order promptly at 9 o'clock by President Cotton, who announced as the first order of business a paper by Mr. Carl F. Kaul, of Madison, Neb., entitled "Setting and Burning Brick."

SETTING AND BURNING BRICK.

Gentlemen of the Convention:

Success in the manufacture of any kind of clay ware consists largely in the setting and burning. Considering the close competition of the present time, every advantage tending towards economy must be strictly observed, and the most improved methods in the manufacture of brick should be secured by all brickmakers.

There are several varieties of kilns now in use in Nebraska, but the kind most largely used is the Dutch or clamp kiln, the operation of which I will describe to the best of my knowledge. As a rule, the kiln should be built with a view to ease in operating it, which lies in building it the proper width; the floor of the kiln should be perfectly level, paved, and kept absolutely dry, and sound brick should be used. Only dry, sound brick should be used in setting the kiln. I have found it best to set the benches so that there will be free circulation across the bench, setting brick on brick, setting a lattice binding tier across the entire bench; this gives free fire into the benches, and between them the heat is thus distributed more easily to the center of the benches. The overhangers should be set two-tight straight on each other, leaving a space for draft between every two-tight brick in the overhangers; the third or fourth course should close the crown of the arch; the next course should be a half skintling along the crown, the joining brick to be set lengthwise on said skintling, and be continued in this manner from crown to crown, which finishes the tight course above the arches; the kiln is then set skintling, with one or two binders set evenly all the way up and about five-eighths of an inch apart. If pressed brick are set, they are set one upon the other, with five brick across on two. Care should be taken that the brick next to the wall are set more loosely, as it requires more heat for the walls. If cracks occur in the wall they should be closed. A kiln set in the above manner offers opportunity for excellent draft through the arch and benches and all the way up.

The next to put on is the platting. In a State like Nebraska, where fuel is high, every plan to economize in the matter of heat



GEORGE F. COTTON, President.

should be used. Careful attention should be used in putting on the platting, as the finish of the burning depends largely on laying them. A row of brick should be laid end to end from the heads to the center, one-half brick apart, which builds a flue across from head to head, and a light platting is put on these running crosswise; after the entire kiln is platted, then take up one brick for draft flues, say two feet and six inches apart, in such a manner as to secure an even draft. Along the center double the flues and lay a ring of four brick around each opening, which forms a flue the size of half a brick, then take up, say, about four feet from the heads, one brick along the kiln on each side, between every row of flues, until the center is reached, where two or three bricks are taken up. The kiln is now ready to start fires in preparation for firing. The fire is started as usual and kept up for about thirty-six hours. After this the fire may be increased as the material may require, but not hot enough to make the black smut blister off the arches, but until the water steam is all off the brick. Care must be taken that after the first row of openings in the platting on top becomes dry they should be replaced from time to time as the brick become dry, until the center is dry, then the top is covered with a layer of earth on the platting, leaving the flues open; by this time the fires should be slowly increased until the center of the arch becomes of a dark red color; then the furnace doors are to be closed; the heat is kept up until the black smut loosens on top of the kiln; care should be taken that all flues draw evenly; those that draw too strong should be partly closed; the fire is now increased until it reaches the high temperature necessary to burn the brick. Care should be taken to keep the heat even until the entire kiln has settled.

The arch brick can be improved by extending the furnaces out so that the grate bars do not reach the inside of the kiln. After the top is entirely burned, close up the furnace and ash pit doors and then the flues on top of the kiln, which finishes the burning.

It should be borne in mind, no matter what kind of kiln we use, that to secure good results we must have our brick set and the draft controlled so as to secure even draft through the entire mass of brick in the kiln. To secure the largest amount of properly burned brick with the least amount of fuel we must construct our kiln in a manner that the heat passes the longest way through the kiln before leaving the interior. By so doing we utilize all the heat.

I have seen a good many yards which I considered very successful, also a good many I deemed failures. Some men, when they put up a continuous tunnel and a stack in the center, with openings for draft in the floor, think "Now we have got it," but when they attempt to operate it find it an elephant on their hands. The continuous kiln builder is usually faulty in not constructing the flues in the right place, at proper distance apart and of the right size. It is the same with a continuous as with any other kiln, in that we have to control the draft horizontally through the entire mass of brick; as in any other good kiln that requires a down-draft to keep the heat along the floor and an up-draft to keep sufficient heat in the upper part, the stack is placed in connection with the flues to secure proper draft. In a high wind, however, the draft in a stack of 100 to 200 feet high would be similar to a small cyclone if not controlled by an automatic draft regulator, which has the effect of preserving an even draft in either windy or calm weather.

Good burning depends largely upon keeping uniform draft. Some kilns are fired by vertical flues set in the brick, and others by furnaces in the floor—the down-draft continuous. There is a great difference in the coloring and discoloring of clay in the burning. Some require more heat than others, and in the building of kilns the kind of material to be burned must be taken into consideration. The continuous kiln, however, will be the leading kiln when brickmakers fully understand the construction and operation of such a kiln.

For common building brick uniform skintling is the easiest and quickest setting and easiest to take from the kiln. Front or pressed brick should be set five on two, crosswise on two lengths.

To commence firing a kiln on the grate bars it is started nearly in the same manner as in a clamp kiln, first drying and then gradually increasing the heat until you secure a red heat several yards rearward; by this time the firing may be commenced on top through the vertical flues. Small shovels should be used, as, on the contrary, by using a large quantity of coal a too large amount of fuel would fall down on the floor and create a gas, which would check the brick. As every one of us knows, in firing a clamp kiln, wherever coal lodges against the brick in the arches the brick will check.

A more uniform color will be secured by a kiln fired by furnaces either entirely horizontal or down-draft. I do not consider it necessary for me to consume any more time in recommendations of the down-draft, as it is already universally recognized as the best by the clayworking fraternity.



C. F. KAUL.

The clamp kiln is used in the majority of yards in our State, and some discussion may arise as to the methods of brickmaking herein described, but the plan I have outlined here has been more productive of success than any other I have tried during my experience as a brickmaker. (Applause.)

After a brief discussion of Mr. Kaul's paper, President Cotton introduced W. H. Bushell, of David City, Neb., who spoke on "Mixing and Drying Clay," as follows:

MIXING AND DRYING CLAY.

Gentlemen of the Convention:

In reading this paper, I thought it best to take up our Nebraska common clay, which most of us are working. I shall try to give you my experience in preparing clay for making brick. I think a good discussion on the subject from members of more ability than myself will be good for all, so that we may go home and mix our clay in better shape and make a better brick.

In the first place, we must remove the black dirt or soil to within three or four inches of the clay, say a space large enough for a season's run, and remove the three or four inches of dirt every day that we left on (as we need to have the clay out); by so doing we keep the clay bank from drying and getting hard on top. After the clay bank is opened up we should manage to cave off the clay from top to bottom of the bank; to do so we must undermine the part we wish to throw down, and cut in a straight line up and down the bank, about eighteen inches deep, on each end of the space we have undermined. Now we go on top of the bank with a heavy iron bar, with a sharp point on one end, and make several holes down about eighteen inches deep, in a line right over the place we have undermined, and we throw our clay in this way, and we have clay enough thrown to make several thousand brick, mixed from top to bottom of the bank in nice shape to load on cars or cart.

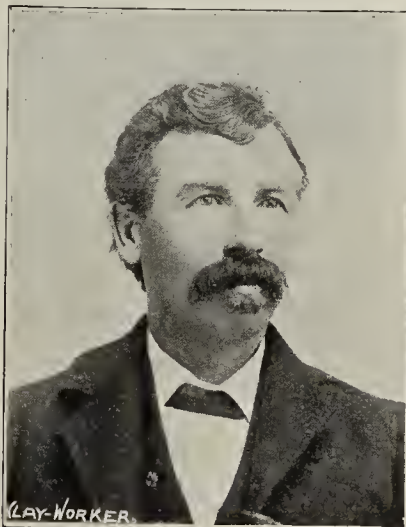
In working the bank see that you keep the walls of the bank about straight, or as near plumb, and the bottom level as possible; it makes the work of mining much easier.

If you are feeding your clay direct from the clay bank to the brick machine or crusher, then it will be well to handle the clay differently. I would make the clay bank on an easy grade, so that a team can plow it. Plow your clay bank from top to bottom, but only plow enough at one time to run a quarter of a day; in that way you keep the clay from drying out and getting lumpy; if it has rained during the night and the bank is wet, then plow enough for a half day's run, and your clay will work about right for a stiff mud machine. It is bad policy to leave out a lot of plowed clay over night; if it should rain, you have a lot of mud; if not, it gets dry and lumpy.

In hauling clay to the machine a team and wheel scraper is much to be preferred; it is the cheapest way, and you can dump the clay at about the place you want it. In hauling in the clay to

mix it, take one load, commencing to load at the top of the bank, and fill the scraper as you go down, and the next load take from the bottom of the bank, and so on right through.

I find it best to keep clay enough at the machine to make a half day's run ahead; then the men that feed the machine do not have to use the clay direct as the teams haul it in, but it lies there awhile and gets tramped over and the dry and wet clay are mixed together. By so doing the machine runs easier and the column of clay, or bar of clay, comes out much better. I would prefer to run the clay through a disintegrator and open top pug mill before going in the brick machine, and add sufficient water to suit the clay. With careful work by the men that attend to the tempering the brick machine



W. H. BUSHELL.

will run right along making good brick and do the work with much less power, and the output will be one-fourth more in a day than if you work your clay direct from clay bank to brick machine. Your brick will not be so good if you work your clay direct from the bank.

I will say a few words on weathering our clay through the winter. Most of our Eastern brickmakers advise hauling out clay in the fall to freeze during winter. It may work in some of our clays to advantage, but my experience has been that it gets too tough and sticky, and we can scarcely make brick out of it. The machine will not make nearly so many brick with it in a day, and it takes considerable more power to run the machinery. The same thing we find in the spring, after our clay bank has been left lying all winter; the first few plowings we have the same experience as with clay that has been hauled out to weather. It will also pay to remove what clay you have left over at the machine in the fall, or it will keep you tightening belts, but after we run a week and get

the clay bank opened up again, then we can make a better brick and more of them in a day, and do it with less power.

You may say that if the brickmaker would clean out his machine and grease the knives and die, and see that all the machinery is laid by in good shape, he would not have any trouble with the clay in the spring; it is all caused by rust; but I will save you that excuse, because with us those things are all attended to in the fall. Fuel and labor cost money in Nebraska.

DRYING CLAY.

Drying some of our clay to get a good, sound brick is a problem, though some clay will dry without a check in it if exposed to sun and wind, but such clay is not to be found on every brickyard. In drying our clay, made by the soft or stiff mud process, the cheapest way is by the rack and pallet system, if your clay will stand it; some clay will not, if molded by the stiff mud process. Then the next cheapest way is the long, narrow dry sheds, where you hack your brick six or seven high. But before we put any brick in the sheds we must see that our hacking planks are down level and solid. The best way I have found to make hacking planks is to take 2x4 scantling and nail them on to 1x4 cleats. We make ours in sections; each section holds three hacks wide and twelve feet long, so we have three hacks on each side of the shed, with a space through the center for the wheelbarrows to run.

Now, the next thing, we must dash the sides of the sheds up tight, and leave the dashes up for a week to give the outside hacks time to dry sufficiently, so that the sun and wind will not cut them. If the wind gets to blowing hard or it starts to rain, we must put those dashes up again to save the brick.

We will now try artificial drying, and it is a good way to dry clay if your clay is tender, and if you make brick early in the spring or run late in the fall, or if we have seasons too wet, or if seasons are extremely dry, like we had two years ago; then the steam drier is by far the best way to dry clay ware. You have only to handle your brick once; that is, to load your car at the machine, until they are dry and delivered in the kiln ready for the setter.

If you have trouble with your brick breaking on the car, do not set them two over two; the space between the brick is too much; that is what makes bats; but hack your brick the same on the cars as you do in the sheds. It will take a little more time to dry but you will get a good, strong brick when it comes out of the drier. If you are troubled with breakage on the bottom course of brick on the car, you can stand your first course on end, and that will equal two courses; then the next course you make a skintle course, and that binds the brick on end together, and you will get the best brick off the car from the place you were getting your poorest, and I believe if we could dry all our brick standing on end we would get a stronger brick, because in drying the clay goes together; the brick, standing on end, is in a position to help itself go together in the center, just where we need the most strength.

In drying brick in a steam drier (our Nebraska clay I refer to) we must go slowly. The time we take is five days. The heat at the cool end we keep at 112 degrees and at the hot end 160 degrees. We draw a part of the steam out of the drier at the cool end, below the floor; that keeps the first courses of brick on the car, or bottom brick, moist, and warms them through the same as the top brick on the car. We do not use a draft strong enough to move all the steam from the center of the drier, but we have several small ventilator flues to carry the surplus steam just enough to keep the ceiling of the drier about dry; in this way we get our brick dry, strong and free from checks.

The dry house should not be less than one hundred feet long, and the cars should be built wide enough to receive two hacks of brick, with a three-inch space between the hacks. We put three hundred brick on a car. We use exhaust steam in daytime and live steam at night. (Applause.)

President Cotton: Our worthy Secretary has given us an interesting and practical paper upon one of the most important subjects pertaining to our business. If any of the gentlemen present care to give their experience we will be glad to hear from them; otherwise we will take up the next on the programme, which is an essay entitled "Hollow Ware," by J. E. Stockwell, of Lincoln:

HOLLOW WARE.

Mr. President and Gentlemen of the Convention:

Friend Cotton, also my friend Bushell here, placed the arduous duty upon me of writing an essay on hollow ware, simply because

I related my experience to them in making out a few thousand hollow brick for a dry air flue for the Telephone Building. The contractor remarked to me he had to send away for some hollow brick. I offered to furnish them; they thought it was all right if I could make them. I went home and fired up my blacksmith forge and fixed a yoke in the back of my end cut die, fastened some rods in the center of each hole for the stream of clay, with a square plate of iron the size I wanted the hollow in the brick. It worked all right, and in two days I had a sample of hollow brick, all but the burning, that was satisfactory to the contractor and superintendent.

The only mistake I made was in not getting quite enough sawdust mixed with the clay. After that I felt like kicking myself for not taking hold and making out the six thousand dollars' worth of fire-proofing that was used in the State Library Building and Telephone Building, but they had already ordered it before I got out my samples of hollow brick, for I am satisfied I could just as well have made it, simply by getting dies of the right pattern and mixing a little more sawdust in the clay, and my intentions are, if ever there should come a time that we are doing business and there is a demand for building material that it would be worth our while to look into the matter and get all the business we can, and making fire-proofing would be another branch of the business to help us out, for one-half of the freight on it from Chicago or St. Louis would be quite a nice profit.

I think the hollow brick like I made for the Telephone Building, leaving out the sawdust so they will have the full benefit of the strength of the clay, are strong enough to stand all the pressure necessary for our ordinary buildings, and are very much lighter to handle; they dry a great deal better, without cracking, and will burn much harder, and for foundations for frame buildings, if they will make thirteen-inch walls instead of eight-inch, as most of them do, will make a much drier and warmer wall, as the hollow in the brick acts as an air chamber all through the wall.

I have found it quite an advantage in making sidewalk brick to have a small core in the die, making a hole lengthwise of the brick only about one-half inch in diameter; it helps to dry them without cracking, especially if I make a large brick, say 8x8x2 inches. Where I have put the small holes through it was almost impossible to break the brick crosswise of the holes, and you will seldom find a broken brick in the kiln, while with the end cut brick you are liable to find a good many, unless you are very careful in drying. Now, that is all, as far as my personal experience goes in making hollow ware. (Applause.)

At the conclusion of Mr. Stockwell's paper President Cotton announced that it was the last of the formal papers prepared, and that a discussion of "Brickmaking in General" was in order, and called on Mr. John Edelmair, of Hooper, Neb., to lead the discussion, who did so in an interesting, though informal, manner.

OFFICERS ELECTED.

The election of officers resulted as follows:

President—George F. Cotton, Table Rock.
First Vice President—J. E. Stockwell, Lincoln.
Second Vice President—John Edelmair, Hooper.
Treasurer—C. F. Kaul, Madison.
Secretary—W. H. Bushell, David City.

Secretary Bushell read a communication from J. B. Jungblut, who was unable to be present, and a number of letters from other absentees, expressing regret at not being able to attend the Convention.

The Executive Committee was instructed to select a date for the next Annual Convention that would not conflict with other clayworkers' conventions.

The Secretary next read the following resolutions, which were unanimously adopted:

RESOLUTIONS.

Resolved, That the Executive Committee be and is hereby instructed to wait upon the Ways and Means Committee of the present House of Representatives and present their claim for a small portion of the money appropriated for the Transmississippi Exposition, to be set apart to defray expenses of the clay exhibit at said Exposition; and

Resolved, That we extend our thanks to the clay journals for the interest they have taken in our Association in publishing proceedings and dates of our Convention and furthering our cause, and that we do all that we can to get the clay journals in the hands of all Nebraska brick manufacturers; also to the press of Lincoln in the able way they publish our proceedings, and the State in general.

On motion the Convention adjourned, subject to the call of the Executive Committee.

LIKES THE CLAY-WORKER.

Publishers Clay-Worker:

Inclosed please find postoffice money order for \$2 in payment for the Clay-Worker for 1897. No money was ever more cheerfully paid. Wishing you the success that your good work entitles you to, I am yours truly,
J. W. McMILLAN.



J. E. STOCKWELL.

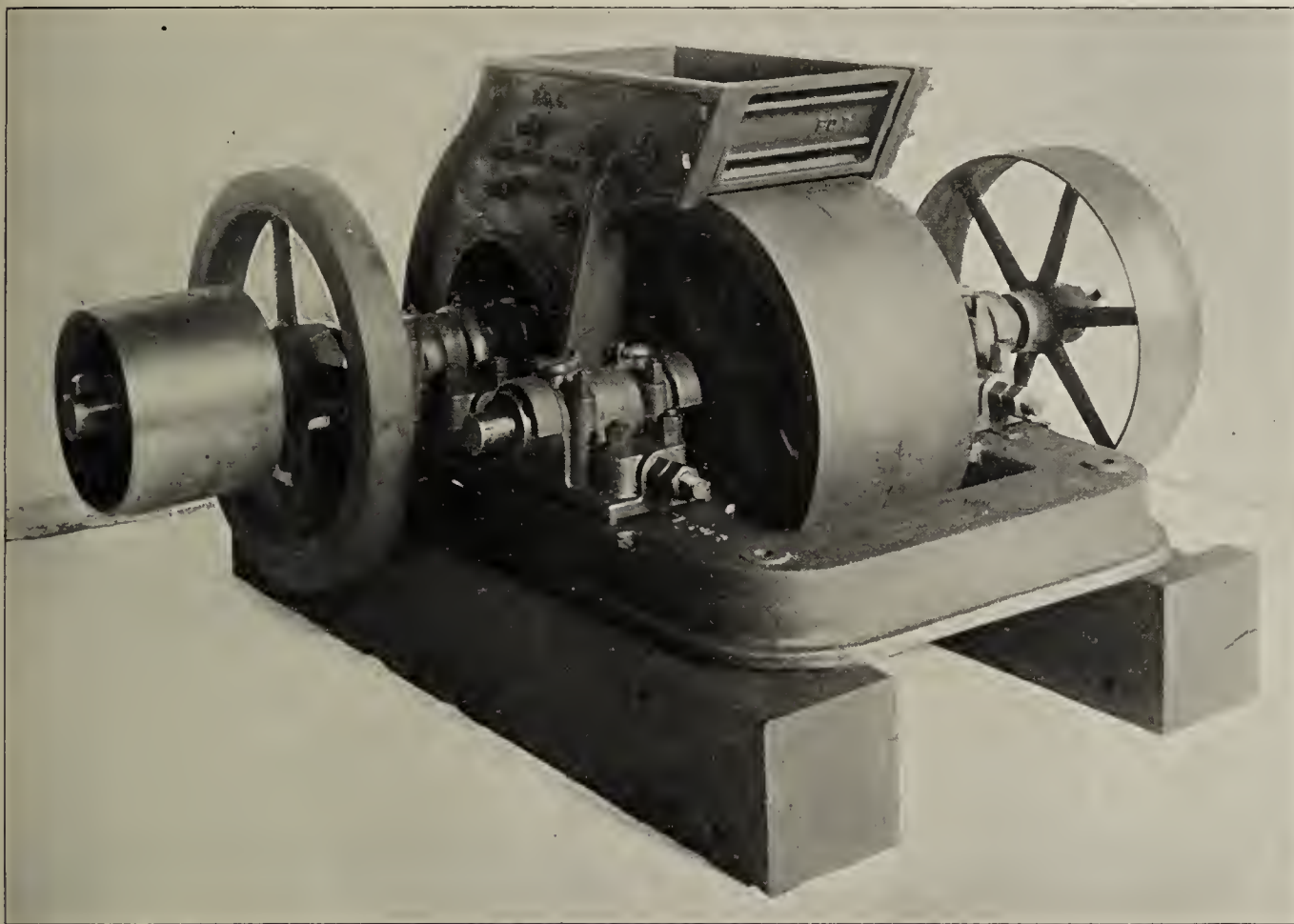
AN IMPROVED CLAY DISINTEGRATOR.

MESSRS. CHAMBERS BROS. COMPANY, of Philadelphia, Pa., are placing before the trade a new size of their heavy clay disintegrator, styled "No. 2 Special." Their observation showed that an excessively wide face of rolls was a disadvantage, and that by reducing the face to sixteen inches the rolls wore true all the way across, instead of hollow in the center, as is the case with wide faces, the bulk of the work being naturally done in the center. The feed roll is of large diameter, and turns quite slowly. The feed roll is very hard, has six cutting bars, and the construction of the machine is such that this roll has frequently been run between 700 and 800 revolutions per minute. The effect on clay is to chip it very fine and put it in good condition for tempering.

Among the superior features embodied in this clay preparing machine they invite attention to the broad heavy iron bed plate. The parting strain between the two cylinders is taken

SOMETHING NEW IN CLAY.

A chance for some large tile factories to make big money. I have letters patent on a burial vault to be built of hollow sections of burnt clay. Each section can be molded through a die the same as drain tile, and cut off in proper lengths. It is made in such a way that each joint on the inside is covered by a molded finish, thereby giving it a beautiful appearance. They can be made in different grades to suit the buyer. The cheaper grade will sell for \$10, so that most anybody can afford one. Another grade will be sold for \$25, to take the place of the \$40 stone vault. It will last as long, or longer, and will be much nicer and save the buyer over one-third in cost; and another grade for \$50. At the prices given the manufacturer and the seller will make large profits. I want parties to take hold of it that have the means of doing a large business. The right party may have as many States as he is capable of giving the busi-



CHAMBERS BROS. CO.'S "NO. 2 SPECIAL" CLAY DISINTEGRATOR.

by two heavy through bolts passing from one journal box to the other, and also affording means of regulating the distance between centers and the degree of fineness to which the clay may be prepared. All journal boxes are made in halves, poured with the best Babbitt metal, and those of the fast running cutting cylinder are provided with oil wells and means for keeping the oil flowing constantly over the journals whenever the machine is in motion. The surplus oil finds its way through channels at the ends of the boxes back into the oil well again. Liberal dirt caps are provided and protect all journals from dirt. The six steel bars projecting from the cutting cylinder are so made that two cutting edges of each bar may be utilized before it is necessary to renew them. An improved form of feed box prevents escape of clay at the sides of machine.

Look over the "Wanted," "For Sale," etc., columns if you want anything in the way of second-hand machinery, experienced help, etc.

ness proper attention in. I want them made on the royalty plan. In answering state what State or States is wanted and give description of factory and clay, also railroad facilities. The right in one State will be for sale. Any one wanting to buy had better apply before they are all let on the royalty plan. After answers are received I will call on the parties with models showing the construction of the vaults. Address

3 R 3 FRANK KAUFMAN, Rosedale, Madison Co., O.

THE GENUINE AND THE COUNTERFEIT.

A noted authority on publicity avers that the real trade paper has an intrinsic value that is far beyond that of the imitation trade paper which is, in fact, but a mass of bound circulars or a mixture of two kinds of advertisements—display ads. and reading notices, commonly called write-ups. Such papers are base counterfeits of the genuine thing, and, at best, poor advertising mediums.

TESTING PAVING BRICK.

THE accompanying specifications and tables are furnished by Prof. Edward Orton, Jr., and complete the report made by him to the N. B. M. A. at Buffalo. The value and importance of the information obtained by Prof. Orton's experiments are, we think, quite fully appreciated by all who have given the matter any consideration. His report, including these tables, will at once be published in full in pamphlet form for distribution among civil engineers and other municipal authorities. Those desiring copies will please address T. A. Randall, Secretary N. B. M. A., Indianapolis.

SPECIFICATIONS FOR A STANDARD METHOD OF CONDUCTING THE RATTLER TEST FOR PAVING BRICK.

I.—DIMENSIONS OF THE MACHINE.

The standard machine shall be 28 inches in diameter and 20 inches in length, measured inside the rattling chamber.

Other machines may be used varying in diameter between 26 and 30 inches, and in length from 18 to 24 inches, but if this is done a record of it must be attached to official report. Long rattlers may be cut up into sections of suitable length by the insertion of an iron diaphragm at the proper point.

II.—CONSTRUCTION OF THE MACHINE.

The barrel shall be supported on trunnions at either end; in no case shall a shaft pass through the rattling chamber. The cross section of the barrel shall be a regular polygon, having fourteen sides. The heads and staves shall be composed of gray cast iron, not chilled or case hardened. There shall be a space of one-fourth of an inch between the staves for the escape of dust and small pieces of waste. Other machines may be used having from twelve to sixteen staves, with openings from one-eighth to three-eighths of an inch between staves, but if this is done a record of it must be attached to the official report of the test.

III.—COMPOSITION OF THE CHARGE.

All tests must be executed on charges composed of one kind of material at a time. No test shall be considered official where two or more different bricks or materials have been used to compose a charge.

IV.—QUANTITY OF THE CHARGE.

The quantity of the charge shall be estimated by its bulk and not its weight. The bulk of the standard charge shall be equal to 15 per cent. of the cubic contents of the rattling chamber, and the number of whole brick whose united volume comes nearest to this amount shall constitute a charge.

V.—REVOLUTIONS OF THE CHARGE.

The number of revolutions for a standard test shall be 1,800, and the speed of rotation shall be 30 per minute. The belt power shall be sufficient to rotate the rattler at the same speed, whether charged or empty. Other speeds of rotation between 24 and 36 revolutions per minute may be used, but if this is done a record of it must be attached to the official report.

VI.—CONDITION OF THE CHARGE.

The bricks composing a charge shall be dry and clean, and as nearly as may be possible in the condition in which they are drawn from the kiln.

VII.—THE CALCULATION OF THE RESULTS.

The loss shall be calculated in per cents. of the weight of the dry brick composing the charge, and no result shall be considered as official unless it is the average of two distinct and complete tests, made on separate charges of brick.

SPECIFICATIONS FOR A STANDARD METHOD OF CONDUCTING AN ABSORPTION TEST FOR PAVING BRICKS.

1. The number of bricks for a standard test shall be 5.

2. The test must be conducted on rattled bricks. If none such are available, the whole bricks must be broken in halves before treatment.

3. Dry the bricks for forty-eight hours at a temperature ranging from 230 to 250 degrees Fahr. before weighing for the initial dry weight.

4. Soak for forty-eight hours, completely immersed in pure water.

5. After soaking, and before weighing, the bricks must be wiped dry from surplus water.

6. The differences in weight must be determined on scales sensitive to one gram.

7. The increase weight due to water absorbed shall be calculated in per cents. of the initial dry weight.

The following resolution was then presented, and after most

careful discussion of all the facts brought out by the data of Messrs. Harrington and Orton, was adopted unanimously:

"Resolved, That, in the opinion of the commission, any paving brick which will satisfy the requirements of reasonable mechanical tests will not absorb sufficient water to prove injurious to it in service. We therefore recommend that the absorption test be abandoned as unnecessary, if not actually misleading."

SPECIFICATIONS FOR THE STANDARD METHOD OF MAKING CROSS-BREAKING TESTS OF PAVING BRICK.

1. Support the brick on edge, or as laid in the pavement, on hardened steel knife edges, rounded longitudinally to a radius of 12 inches and transversely to a radius of one-eighth inch, and bolted in position so as to secure a span of 6 inches.

2. Apply the load to the middle of the top face through a hardened steel knife edge, straight longitudinally and rounded transversely to a radius of one-sixteenth inch.

3. Apply the load at a uniform rate of increase till fracture ensues.

4. Compute the modulus of rupture by the formula

$$f = \frac{3}{1} \frac{W}{b d^2}$$

in which

f—modulus of rupture in pounds per square inch.

w—total breaking load in pounds.

l—length of span in inches—6.

b—breadth of brick in inches.

d—depth of brick in inches.

5. Samples for test must be free from all visible irregularities of surface or deformities of shape, and their upper and lower faces must be practically parallel.

6. Not less than ten brick shall be broken and the average of all be taken for a standard test.

SPECIFICATIONS FOR THE STANDARD METHOD OF MAKING CRUSHING TESTS OF PAVING BRICK.

1. The crushing test should be made on half bricks, loaded edgewise, or as they are laid in the street. If the machine used is unable to crush a full half brick, the area may be reduced by chipping off, keeping the form of the piece to be tested as nearly prismatic as possible. A machine of at least 100,000 pounds capacity should be used, and the specimen should not be reduced below 4 square inches of area in cross section at right angles to direction of load.

2. The upper and lower surfaces should preferably be ground to true and parallel planes. If this is not done, they should be bedded in plaster of paris, while in the testing machine, which should be allowed to harden ten minutes under the weight of the crushing planes only before the load is applied.

3. The load should be applied at a uniform rate of increase to the point of rupture.

4. Not less than an average obtained from five tests on five different bricks shall constitute a standard test.

The following resolution was then presented and unanimously adopted:

"Whereas, from the experimental work done so far by this commission, or by others so far as is known to us, in the application of the cross-breaking and crushing tests to paving bricks, it is not possible to show any close relationship between the qualities necessary for a good paving material and high structural strength as indicated by either of these tests,

"Resolved, That for this reason the commission recommends that these tests shall be considered as purely optional in the examination of paving material, and not necessary as a proof of excellence."

A BUSY PLANT.

The Sheridan, Ind., Brick Company, with which "Brick-maker to the President" J. C. Adams was formerly connected, has been running right along through the winter. Mr. O. H. Root, who now presides over the company's destinies, states that while trade is by no means lively, they are selling all the brick they can make. He says the report that the plant was badly damaged by fire a month or more ago was an exaggeration. Neither did the fire originate in or damage their "Standard" drier. The latter, Mr. Root says, is one of the most valuable features of the plant. Without it they could not have run all winter, as they have.

A BRICKYARD ON CORBETT.

J. B. Gallagher, Prospect street, Pittsburg, it is said, wants to wager a brickyard, valued at \$3,500, against \$1,000 in cash, that Corbett will whip Fitzsimmons.

GALESBURG POTTERY.

"A little experimenting," says the Galesburg (Ill.) Journal, "is now going on at the plant of the Galesburg Pottery Manufacturing Company, and should the new scheme prove a success Galesburg pottery will lead them all for fine ware. The

company has engaged an Eastern expert, who is making tests of a new glazing, known as the Bristol glaze, and we are informed by the management that it bids fair to be a success. They are burning the first kiln at present. The idea is to put a milk-white glaze on the inside and outside of ware instead of black."

TABULATED RESULTS

OF A

SERIES OF TESTS ON THE EFFECT OF STRUCTURE ON THE WEARING POWER OF PAVING BRICK.

RATTLER TESTS											CROSS-BREAKING.									
Series Number.	Test Number.	Composition of Charge.			Percentage of Loss on 1000 Revolutions.	Percentage of Loss on 2000 Revolutions.	Average Loss of Test Brick in 1000 Revolutions.	Average Loss of Test Brick in 2000 Revolutions.	Description of Brick.	General Average of All Brick of One Type.	Number of Brick Tested.	Average Modulus of Rupture.	General Average of All Brick of One Type.							
		Standard Brick.	Other Brick.	Test Brick.																
I	1	8	0	5	14.13	21.41	15.59	21.43	End Cut, Repressed.	59 Bricks, made on 4 different machines, tested in 11 different tests, 18.23% and 26.67%.	5	2374	9 Bricks, made on 2 different machines, tested in 2 different tests, 2525.							
I	2	8	0	5	16.43	21.62														
I	3	0	5 X	8	16.21	21.27														
II	4	9	0	4	21.96	31.94	17.94	24.47			4	2710								
III	5	8	0	5	17.30	.....														
III	6	8	0	5	16.88	22.68														
III	7	0	4 IX 1 XII	8	19.63	26.27														
IV	8	8	0	5	17.40		19.45	28.13			5	2008								
IV	9	9	0	4	18.93	26.83														
IV	10	8	0	5	20.36	.....														
IV	11	8	0	5	21.11	29.44	17.29	26.14	End Cut, Plain.		5	2370								
V	12	8	0	5	14.68	24.47														
V	13	8	0	5	21.98	30.58														
V	14	5	0	8	15.22	23.39	25.90	34.02			4	2920								
VI	15	8	0	5	20.43	26.88								2	2497					
VII	16	8	0	5	27.30	.....														
VII	17	8	0	5	31.22	42.39	23.33	32.72			3	2497								
VII	18	0	6 XIV	7	19.18	25.65														
VIII	19	8	0	5	20.00	28.32														
VIII	20	11	0	2	26.67	37.13	Average of 106 End Cut Bricks—19.54 and 27.00.			Average of 23 End Cut Brick, 2463.										
IX	21	8	0	5	19.10		21.10	29.81	Side Cut, Repressed.	35 Bricks, made on 3 different machines, tested in 8 different tests, 26.51% and 35.30%.	3	1933	11 Bricks, made on 3 machines, in 3 different tests, average 2347.							
IX	22	8	0	5	24.81	33.43														
IX	23	0	III 8 XII 1	4	19.41	26.19														
X	24	8	0	5	24.60		32.19	44.07			5	2128								
X	25	8	0	5	44.11	52.31														
X	26	0	1 8	5	29.83	35.64														
X	27	0	IX 4 III 8	1	30.22	44.26	20.00	29.59			3	3127								
XI	28	8	0	5	20.00	29.59														
XII	29	8	0	5	25.50		21.23	21.27	Side Cut, Plain.		3	1973								
XII	30	10	0	3	16.97	21.27														
XIII	31	8	0	5	27.60		24.35	24.35			2	2775								
XIII	32	10	0	3	21.10	33.00														
XIV	33	8	0	5	23.88	33.25	23.88	33.25			2	3030								
XV	34	8	0	5	22.00									5	2126					
XV	35	8	0	5	22.49	35.83														
XV	36	0	7 VII	6	20.72	27.90	Average of 72 Side Cut Bricks—24.43 and 32.90.			Average of 23 Side Cut Brick, 2347.										
XVI	37	9	0	4	19.40	25.20	21.09	27.72	Dry Pressed, Coarse. Medium. Fine.	11 Bricks 21.09 and 27.72.	3	2507 2740 2687	2644							
XVII	38	10	0	3	23.80	28.26														
XVIII	39	9	0	4	20.07	29.71														
Average of 11 Dry Pressed Bricks—21.09 and 27.72.											Average of 9 Dry Press Brick, 2644.									



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

BUTTON-HOLE TALKS.

Editor Clay-Worker:

"I was so glad," said a corpulent brother, as he stood on my corns and leaned me up against a post in the hotel lobby, "I was so glad that Kimbell spoke as he did, in such a cordial manner, urging that any one who might wander off on the outskirts of the fold as far as Chicago should look him up and visit him in his factory.

"Kimbell don't make so much show up and down, don't brush many leaves off the high branches when he walks in the orchard, but, taken any other way, he measures a whole lot. Why, he has to measure a good ways around to hold his heart, you know. He don't pretend to hold his laugh, though, you notice, for he wears that on the outside, and it just ripples out and does good wherever he travels. Why, that laugh of Kimbell's will be one of the features of the Convention from now on, for Kimbell has come to stay. If he don't come after this we will go get him. Why, that laugh of his does most everything—sells brick up in Chicago right along, and sells lots of them, too. Folks go in feeling cross and ready to find fault, and ugly and mean, and they run into that laugh, and it tickles their sides, and the first thing they know they have their receipted bills and are going off happy. Why, that laugh of his is better than medicine. It has a contagion all its own, and he who hears it immediately goes down in the dust and moss of his system, hunting for his own old, forgotten, musty laugh, and hunts it out, and unties it, and brushes it up, and sends it out chasing Kimbell's. But, bless you, none of them can catch his. They just chase on after, limbering up their stiff joints and shaking out the creases that have come from long laying away, and they get to be really astonished to see themselves in action, and their owners have such a funny look, as though they hardly recognized their own belongings.

"Talking so much about his laugh, I don't need for a minute to call your attention to the fact that he always wears a very large sized package of ideas under his hat. Did you notice the cordial way in which he extended the invitation, 'excepting only in case of a strike?' Now, I will just bet you that in case of a strike visitors wouldn't just want to run up against Kimbell—not the visitors he did not want. Not very many, and not very much. Anyway, his having a strike is too remote a contingency, as I understand he has treated his men so fairly and they esteem him so highly that any one who tried to talk to them against him would have a hot time, indeed.

"Running one of the biggest yards in the country, he wears no frills, but just tends to business—makes brick, sells brick, and repeats it over and over, and all the while he is ready to take you by the hand and cheer you with that laugh so that you will really feel better for having seen him.

"No, Gates, we have lots of nice fellows, but only one Kimbell, and we have just got to have him every Convention hereafter."

GATES.

Philadelphia Brickmakers Get Together.

Editor Clay-Worker:

At a meeting of the brick manufacturers of Philadelphia, held at the Builders' Exchange on March 1, the Brick Manufacturers' Exchange of Philadelphia was reorganized and the following officers were elected:

President—James Dingee.
Vice President—Thos. H. Flood.
Treasurer—A. H. Keyser.
Secretary—Ed Flood.

A Board of Directors, consisting of nine members, to represent the different sections of the city, was elected as follows:
Northern Section—Charles Murtha, James Dingee, Thos. Flood.

Southern Section—Murrell Dobbins, Edwin Webster, W. H. Clothier.

Western Section—William Conway, Charles Kimbell, Samuel Lloyd.

The Board of Directors was empowered to act upon all matters pertaining to the business of the Exchange. The idea for forming a Board of Directors was that, being composed of a smaller number of the more active members, they would meet more promptly and act quicker upon any important question that might arise; that they could get together quicker upon shorter notice than the whole Exchange could, and that any important question brought to the attention of one of the members could be disposed of very quickly and then reported to the Exchange for approval.

The first important business was to try and arrange a schedule of prices that would come somewhere near pleasing the majority of the manufacturers of the whole city. The trouble heretofore has been the wide difference in the prices that were desired by the firms in the different sections of the city. The schedule, as finally agreed upon, was as follows:

Hard brick.....	\$7.00 to \$8.00 per 1,000
Salmon brick.....	5.50 to 6.00 per 1,000
Stretchers	9.00 to 13.00 per 1,000
Pressed brick.....	17.00 to 19.00 per 1,000
Machine pressed brick.....	12.00 per 1,000

The important part of this agreement as to prices was that each firm agreed not to sell below the lowest price agreed upon for the several grades of brick. The reason for the sliding scale is hard to understand outside of Philadelphia. The different sections of the city are so widely separated that competition is more or less confined to the different firms in their immediate vicinity. The brickmaker of the southern section rarely, if ever, comes in competition with those of the northern section. The distance is too great for economical delivery of the brick. The demand for certain grades of brick in one section is so much greater than in another that it puts a better price upon the brick of that grade in that immediate section.

To harmonize these differences, that naturally arise for these reasons, the sliding scale was adopted, with the hope that the price could be kept above the lowest quoted. For instance, while the brickmaker in the southern section of the city would think that \$5.50 for salmon and \$7 for hard would be a fair price, as things are going now, the brickmaker in the northern section feels that to do as well as that he should get at least \$6 for salmon and \$8 for hard brick. They explain this by quoting the fact that so many dwelling houses, requiring a large number of salmon brick, are built each year in their vicinity that their percentage of salmon is larger and the percentage of hard brick is smaller; that the brickmaker in the southern section of the city has a better market for hard brick and can dispose of a larger percentage of hard brick. There are other reasons that possibly have a bearing upon this, but I think this is the important one. I write this to correct any wrong impression that may get out as to the use of the sliding scale in the price. It is virtually two different scales of prices, one to suit one section and another to suit the other section.

X. Y. Z.

Roofing Tile Discussion at Buffalo.

Editor Clay-Worker:

The writer was not present at the N. B. M. A. Convention at Buffalo, and, having read the reports, wishes to express his disappointment that the question, "Is It Advisable to Combine the Manufacture of Roofing Tile and Brick?" was treated so lightly. It is quite evident that those who spoke upon the subject either were not interested or did not wish to answer the question proposed. It is not strange that those who have been able to keep their factories in operation on account of the great demand for paving brick should not wish to make any changes in their plant or that those already engaged in making roofing tile should not wish to say anything having a tendency to increase the number of competitors, but a much greater number who have had their plants stand idle, and who, even in prosperous times, can overstock their limited market, would be glad to receive any information that would enable them to use their works more profitably. The manufacture of roofing tile must of necessity be a rapidly growing industry. The forests that covered the Western States but two generations ago have disappeared. Shingles, on account of decay and inflammability, are not suitable for a roof. Tiles in Europe are used to cover the houses of the poor, and in the United States they are used to cover public buildings and the mansions of the wealthy. There is no reason why they cannot be made so, as to come within the reach of a man of moderate circumstances, and it will soon be done. The manufacture of roofing tile, tower tile, finals, crestings, etc., demands more than ordinary skill, and will always command liberal compensation. The more skillful manufacturers will combine the manufacture of terra cotta, but there is a large field, and it may be not less profitable, which

the brick and tilemaker may enter—the manufacture of roofing tile and simple crestings or ridge tile to take the place of shingle and ridge boards on common dwellings. There should be an immediate and increasing demand for these, for the time has already come when no shingle should be laid. Let us consider what changes would be required in a modern tile factory. Many of our best factories have a dry pan, pug mill, brick machine, a drier and cars. All these are required in a modern tile factory. All that would be required in order to make roofing tile would be a roofing tile press, pallets and racks on the cars. The round down-draft kiln is suitable for burning; where they are higher than they should be for plain setting, seggar blocks should be made. These additions to a plant would cost but little. Now we approach the question brought before the Convention, "Is It Advisable," etc. This is a question that the brickmaker must answer himself. There may be local objections, such as unfitness of the clay for the purpose or the lack of a demand for roofing tile. There may be private reasons, lack of funds to carry on tilemaking, but on the supposition that there are no serious difficulties of the nature indicated would it not for many reasons be desirable? If the factory has made sufficient brick through the summer to meet all demands it might make roofing tile through the winter. It requires but one-eighth the amount of clay to make roofing tile of the same value as brick, hence less space is required for storing the clay and for the ware in the kiln. The freight is proportionately less. Roofing tiles are sent from a few factories all over the country, from New York to Colorado, from Ohio and Illinois to New Orleans. Nearly all orders are from persons of wealth or wealthy corporations. In Europe it is the roof covering for even the houses of the poor. Mr. Batley, in the Convention, said: "Anybody who has worked in a brickyard in England knows that no brickyard that has the clay for making good brick conducted its business without making roofing tile." This fact was worthy of consideration, and should not have been set aside by the statement that the tiles they made were very heavy. Since the time of which he speaks the art has greatly advanced in England and all Europe. One of the best made tiles in this country is a German tile, the Ludowici, and they are made by imported German machines. We have no reason to boast of our superiority in the art. Another fact worthy of consideration is that the Ludowici Company stoutly maintains that a vitrified body is not necessary for a durable tile. The question under discussion was not intended to cover cases where the clay was not suitable for making roofing tile, and the statement, "I know of two or three cases where it was tried and the clay was not suitable for making roofing tiles, and it proved a failure," seems to me to be irrelevant and calculated to create a wrong impression. There are many places where drain tiles are successfully made from clay that cannot be profitably made into brick. The clay will dry safely in a cylindrical form, but in the form of brick it will crack in drying. There is no clay that is suitable for all wares. A manufacturer is fortunate if it is suitable for the principal ware he wishes to make. If he wishes to make anything else he must use the arts of the terra cotta worker. Bath brick are made from a clay that is very slightly plastic and the sand in it is almost impalpably fine. Such a clay is scarcely suitable for anything else. Many kinds of ware are made in the same factory, differing in form as much as bricks and roofing tiles, using the same plastic clay for a bond and a more or less coarse material, according to the size of ware to be made. Crushed sandstone, pottery ware, bricks, broken glass, and I know not what else, are used in the "mix" of terra cotta workers. We are informed by the Clay-Worker's correspondent in Deutschland that it is a common practice to mix sand and ground burned clay with clay for making roofing tiles in Germany. We are of the opinion that there are clays that will make good earthenware tile that, without admixture of other material, will not make good bricks, and that there are clays that will make good bricks that are not suitable for roofing tile, and that the clays that will make good roofing tile are as abundant as the clays that will make good brick. We are also of the opinion that any brickmaker whose factory is not well employed should consider and determine, for no one can decide for him, if it is desirable to combine the manufacture of roofing tile with brick.

GEO. S. TIFFANY.

As Others See Us.

Editor Clay-Worker:

Please find inclosed our check to cover yearly subscription to Feb. 28, 1898.

We are very much interested in the Clay-Worker, and find it to be of great value to us in many ways. While its attention is given mostly to the manufacture of building and paving brick, yet there appears occasionally an article on the manufacture of fire brick and other clay work that makes it of much value to all of us. We extend our congratulations.

OAK HILL FIRE BRICK AND COAL COMPANY,

R. R. DAVIS, Manager.

Impressions of the Buffalo Convention.

Editor Clay-Worker:

The Clay-Worker, containing a full report of the Buffalo Convention, came duly to hand, and I congratulate you on the accuracy of your report and the excellent manner in which it is presented.

In regard to my impression of the Convention, would say to you, as I have to others, that, in my opinion, it was one of the most successfully conducted gatherings that it has ever been my privilege to attend. The work that the organization is striving to accomplish for those engaged in the manufacture of clay products needs only one thing, and that is the hearty co-operation of those in whose interests the work is being done.

There is not a manufacturer of clay products in this country who can afford to be so blind to his own interests as to fail to become identified with the organization, and, where circumstances will permit, attend its Annual Conventions. I say in all seriousness that thousands of dollars could be saved to brick manufacturers annually if they would simply avail themselves of this opportunity to profit by the experience of others, as expressed both publicly and privately, at the annual gathering of the brick manufacturers of the United States and Canada.

Assuring you of my lively interest in the organization and its work, tendering my services whenever they may be of use and hoping to have the privilege of meeting with you again in 1898, I remain, very truly yours,

F. H. S. MORRISON.

New York, Feb. 20, 1897.

The Up and Down-Draft Kiln.

Editor Clay-Worker:

I have read with a great deal of interest the discussion at the Convention of the merits of the up and down-draft kilns. Nearly all concede not less than 5 per cent. of salmon brick in the up-draft kiln, and from that to 20 per cent.

With your permission I will give you an experience I had a few years ago in burning up-draft kilns. I was engaged to burn brick on a plant that had been erected to make the brick for one of the largest private residences in this country. The brick plant cost not less than \$50,000. The specifications called for all hard, smooth and straight brick. I had the hot-air furnace kiln, up-draft, and burned as follows:

As the coal cinders accumulated I had them screened to get rid of the fine dust, as it would interfere with the draft of the kiln in the use they were put to. After getting the fire up uniform all over the top of my kiln and about one-third of the settle required to burn the brick, I covered the top about three inches deep with the screened cinders. After the kiln was covered I took fine, damp clay and banked on both ends and sides, or heads, to prevent fire from stealing up the walls. The heads and ends must be kept as near air-tight as possible. After the kiln is first covered it will have but little draft, the arches and fire boxes retaining their heat, with but little, if any, fuel, for several hours. The cinders will take fire, being mostly coke; the draft will then start up, but it will not require so much fuel, and the kiln will settle slowly and uniformly; it will get very hot on top, making a stationary wooden roof dangerous. I had hard top, no ragged or crooked arches, the heads harder than any other part of the kiln. I used sharp sand between the brick in the arches; that, of course, depends on the nature of the clay. I set those kilns forty-nine courses high, and three brick length from the wall a little more open than balance of the kiln. While the plan is not very expensive, it requires some extra work, and it would not do very well for face brick on account of the dust and ashes, but if you use good platting you can clean the top off and sweep it, and very little sifts among the brick. The color was very uniform from top to bottom. I would not advise every one to set forty-nine high, however, but that clay stood all right. I have no fault to find with down-draft kilns, but you can burn as large a per cent. hard in the up-draft as you can in the down-draft if your market demands it. I was on one of the best equipped plants in this country two years ago, and they had from six to eight courses of pale brick in the bottom of kiln, and, unless you take special pains, you will have light brick in all kinds of kilns.

As I have never seen any mention of this place in the Clay-Worker, I will state that I am in the employ of the Elgin Press Brick Company. Our General Manager is M. T. Smith, formerly of Richmond, Ind. We have the Lion (five-mold) and a four-mold Penfield, with a capacity of about 7,000,000 per year. We make a very fine red dry press brick, also a very superior buff brick. Business was not good here last season, but there is some prospect of a better season ahead.

Wishing the Clay-Worker every success, I am,

Elgin, Tex.

J. B. MORRISON.

THE NEW YORK MARKET.



ARCH 1, and the brickmakers as dormant as butterflies. Generally in midwinter they send carts and trucks and wheelbarrows to the wheelwright and blacksmith shop to be repaired for the coming season; thus far nothing of that kind has been done. When spoken to about that kind of work, the reply is, "Time enough." The same with pumping out the clay banks or having the machinery put in order, as well as other work that is done at this time of the year. The heart of the tide-water manufacturer is sorely depressed at this time, and he does not want to spend a cent more than he possibly can help. What the coming season has in store for him, whether a repetition of the last three or some improvement, he does not know, but is inclined to think he will have just as poor a year as the one of 1896.

In February of each year I have always placed before your readers the amount of stock on hand the first of the year, but am one month late this year. As the prices are compared, it will no doubt make some of your readers feel good to think they are not in it.

—Brick Made.—

1895.	1896.
1,000,000,000	1,000,000,000

This takes in South Jersey, Staten and Long Islands, as well as Hackensack and along the Hudson from Haverstraw to Albany, all of which places stock, with small exception, on the New York market. The capacity of the Hudson river yards as to the output is about 700,000,000, if the demand called for them.

—Stock Under Shed Jan. 1.—

1896.	1897.
87,400,000.....Haverstraw Bay.....	76,000,000
90,000,000.....Other points on North river.....	109,000,000
49,600,000.....New Jersey.....	39,000,000
3,000,000.....Staten Island.....	3,000,000
3,000,000.....Long Island.....	8,000,000
233,000,000	235,000,000

When the amount on the barges held under cover is placed to the credit of 1897 and estimated at 15,000,000, there were in sight, on Jan. 1, available till new brick come on the market, 250,000,000 of brick, exceeding the number of the previous year. To-day there are brick under sheds in Hackensack that were made in 1895, which is only a straw to show what, with shed room, can be held. One of the largest yards here has at present over 8,000,000 of brick made last year. It takes capital to make and hold that number for any length of time, and then probably sell them for a lower rate, or, at least, for no more, than could have been realized last fall.

—Prices Jan. 1.—

	1894.	1895.	1896.	1897.
Pale	\$2.00@2.25	\$2.00@2.25	\$1.75 @2.25	\$1.75@2.25
New Jersey ..	4.50@5.50	5.00@5.75	4.75 @5.25	4.25@4.50
North river ..	5.50@6.00	5.50@6.00	5.12½@6.25	4.25@4.75

Verily, the last rates are very low for brick on the eve of close of navigation. Take the best figure of 1897, \$4.75; deduct \$1.25 for freight and commission. Is it possible to make them for that rate and load them in the winter at a cost of 20 cents per thousand? How do the others fare who receive in gross less for their stock? There is not a manufacturer in Hackensack to-day that places any value on his clay and sand in figuring on what it costs him to make brick, except one yard that pays royalty, and, of course, that item must be added. The others own their property.

—The Market.—

Navigation is open at all points except above Haverstraw, with arrivals from that point in the first few days of forty barges on a market that has not worked off stock which is under cover. Can the present low rates be maintained with such shipments, and only, one may say, from one place? The 1st of March will see the first brick loaded in Hackensack, but does not go to the New York market. The probabilities are, if this letter was written later in the week, a shade in rate would be in order. How is this: North rivers, \$4.50@4.62½@4.75; New Jerseys, \$3.75@4@4.25? A. N. OLDTIMER.

Portland, Me., one of the most beautiful cities in New England, is noted for its brick residences. These brick residences are largely the source of Portland's beauty. Her people have learned somewhere of the advantages of brick architecture. Strange that places which manufacture more bricks than Portland should be so far behind her. After all the miles of clay

that in Brewer and Bangor have been turned into brick, the brick residences of the two cities may be counted on the fingers.

PACIFIC COAST NEWS.

The Simons Bros., will start a brickyard at San Pedro, Cal.

A. E. Brown will start a brick kiln near Aztec, N. M. It is his intention to burn 150,000 brick this spring.

The foundation for the annex at Clark's West End Pottery, at Alameda, Cal., has been completed. The addition is to be devoted to the architectural terra cotta department. The building will be 100x100 feet in area. Two new kilns have been put in, and the pottery is now running full force.

The Directors of the San Jose, Cal., Brick Company will hold a meeting on March 13, 1897, for the purpose of electing five Directors, also for the purpose of adopting new by-laws for the company and transacting any other necessary business.

The Antioch, Cal., Pottery Company recently shipped about fifteen large cases of flower pots of all sizes to the Hawaiian Islands. The cases contained about 11,000 pots. Brick made by this pottery are now on exhibition in the rooms of the San Francisco Board of Trade.

A valuable deposit of aluminum clay has been discovered in California. It is located in Barstow, San Bernardino county, in the extreme southern part of the State. The ore is pure white clay, and is evidently a water formation. It is in the form of a blanket ledge, three feet in thickness, and extending over an area of two hundred acres. The finders, E. H. Thomas, ex-City Marshal of San Bernardino, and John Wood, together with E. W. Thomas, Frank Talmage, N. M. Strong and George Melrose, all of San Bernardino, have located eight claims, covering the entire surface deposit.

The Los Angeles Pressed Brick and Terra Cotta Company has brought suit against A. B. Bray et al. The suit is to determine the amount due for labor and material supplied for the erection of a house on the Bonnie Brae tract. The building was to cost \$3,118, and the plaintiff sub-contracted for certain work, and \$38.85 remains due. The sum of \$200 is also asked as attorneys' fee, and a decree against the property.

SOUTHERN TRADE NOTES.

The Pitcher & Creager Brick Company, of Baltimore, Md., has been incorporated, with a capital stock of \$100,000, to continue the business of Pitcher & Creager in the manufacture of brick and terra cotta. N. H. Creager is President; J. G. Cook, Secretary and Treasurer.

The Mansion Pottery Company, Louisville, Ky., has been incorporated, with a capital stock of \$10,000, and will extensively increase the business of the concern they succeed.

Pikeville, Ky., parties are talking of establishing a brick works of moderate capacity at that town to supply the needs of the entire upper valley. The experiment seems one of promise.

The Virginia Mosaic Tile Company has been incorporated at Norfolk, with A. R. Duman President and A. E. Parati Secretary and Treasurer, and the capital stock placed at \$3,000.

A site has been selected near Abbeville, Ga., for the erection of a plant for manufacturing brick on a large scale, the venture being backed partially by local capital.

Montgomery, Ala., will expend something near \$300,000 the coming summer in street paving, the city having appropriated \$150,000, the balance to be paid by the property holders. The Mayor will furnish information.

John G. Kaiser and associates, of St. Louis, Mo., are considering the erection of a plant for the manufacture of vitrified brick, and with a capital of not less than \$200,000.

It is currently reported in the East Liverpool (O.) field that pottery men of that place are about to organize a company for establishing a tilemaking plant at Zanesville, O.

Apperson & Leiper, of Little Rock, Ark., will put in a brick works, with a capacity of 40,000 daily, partially paving material. It is estimated the works will cost \$25,000.

Work has begun at the recently completed plant of the Dixie Tile and Pottery Works, at Oxford, Ala., and the plant is expected to remain in activity all summer.

The Mountain State Brick and Tile Company, of Point Pleasant, W. Va., has recently finished the last of a lot of half a million feet of drain tile, made in a continuous run. This is a new but very active plant.

The partially completed buildings of the Camden (W. Va.) Clay Works, a massive plant on the Ohio river, were considerably damaged by the overflow of that stream the past two weeks.

The Columbus (Ga.) Pottery Works, completed a month ago, are running steadily, and results so far have been satisfactory. The plant is backed by H. M. Howard, of Columbus, and R. W. Matthews, of Rock Mills, Ala.

DETROIT NEWS.

The plant of Haggerty & Proctor, which has been idle for some time, is now operated by Proctor Bros., William H. and Otis M.

John C. McDonald has bought from Archer & Collins their plant in Springwells. It is believed he will operate his old yard along with this one next season.

Charles H. Bryan is negotiating with Greusel Bros. with a view to renting their new plant. It is his intention to manufacture nothing but stock brick, using the pallet rack system.

The past season brickmakers have enjoyed a good market, but the price of brick was not what it should have been, the average being \$4.50 per thousand for common, and where no great amount was wanted stock was sold at the same figure.

The price of brick has raised. Common is now selling at from \$5 to \$5.50; stock at \$6. The chances are that a further increase in price will be asked before the opening of the season, as the stock on hand is greatly diminished. If the weather remains good the architects report an immense call for brick.

The R. H. Hall Brick Company, situated on the Detroit river, below Detroit, has dissolved. It is supposed the venture was not a paying investment. The plant is undoubtedly the largest in the State of Michigan, and was erected at an enormous cost. It has a capacity of 250,000 brick per day, equipped with the latest and most improved machinery, engine and boiler, etc. The kiln shed is nearly one-half mile in length.

DOROTHY DALE.

OHIO VALLEY NEWS.

Work is being resumed in full in all the brick and sewer pipe works in the valley, with the prospect of a good spring trade.

An important transfer of clay property occurred at Penrith, W. Va., Feb. 15. The sewer pipe works built and operated for many years, until their failure, by Anderson Bros., at Penrith, W. Va., was purchased by Frank E. McElfresh, who was General Manager of the works, from W. L. Standish, of Sewickley, Pa. The works, yards and all mineral rights are included in the transfer.

Messrs. Evans and Cooper, of Uhrichsville, O., receivers of the Royal Clay Manufacturing Company, of that place, paid, on the 15th of February, \$6,436.91 to the employees, being the amount due them in wages at the time of the failure of the big plant. The receivers have not yet received an order from the court to sell the plant.

It is possible that a consolidation of the two large brick plants of George M. Werder and Clyde King, in the vicinity of Earlytown, near Portsmouth, O., may be effected this spring, the matter being under consideration at present.

The brick manufacturers of the valley are preparing to bid upon one of the largest brick contracts ever let in the United States. A tunnel is to be built under East river to connect New York and Brooklyn, and to arch the same will require 20,000,000 fire brick. The letting will be made in the near future.

Chas. H. Dangler, of Sharpsburg, Pa., is at the head of a company that has leased the Mingo (O.) keg factory, and proposes to change it to a pottery for the manufacture of fine porcelain and art ware. The kilns are now in course of erection, and the works are expected to be in operation by April 1.

A new labor organization, known as the National Clayworkers of America, with headquarters at Toronto, O., has been incorporated under the laws of Ohio. The officers are: Jasper F. Ball, President, and David Bell, Secretary of the national organization, and they are having charters prepared for the organization of local unions all over the country. The Toronto local union is known as the United Clayworkers, and is composed of practically all the men employed in the clay works in this great center of the clay industry.

The Baggott Pottery, of East Liverpool, O., has been purchased by John Mountford for \$15,500. The plant will be greatly improved and enlarged for the manufacture of white ware. Mr. Mountford was for many years senior member of the well-known pottery firm of Mountford & Co.

The Quaker Valley Pottery Company, of Rogers, Columbiana county, Ohio, has been incorporated, with a capital stock of \$15,000.

The Downer Fire Brick Works, of Irondale, O., have resumed, after a shut-down of about a month.

Work was resumed at the Barnard Brick Works, at Bellaire, O., March 8, after a three months' shut-down.

The Mack Manufacturing Company, of New Cumberland,

W. Va., are preparing to start their three sewer pipe works and six brick works on March 15.

BUCKEYE.

OBITUARY.

Samuel F. Selden.

In the death of Mr. Samuel F. Selden, which occurred at his home in Erie, Pa., Monday, Feb. 22, the brickmaking craft loses one of its most promising members. He was a civil engineer by profession, but had been connected with the Selden Brick Company for a number of years. He was sick but a few days and his death was wholly unexpected. Being but thirty-three years of age and an exceptionally bright and vigorous man, his death seems particularly untimely and sad. He was an active member of the First Presbyterian Church of Erie and those who knew him intimately say that everything that was good, true and honest had his warmest sympathy and support.

Death of Otto Giessen.

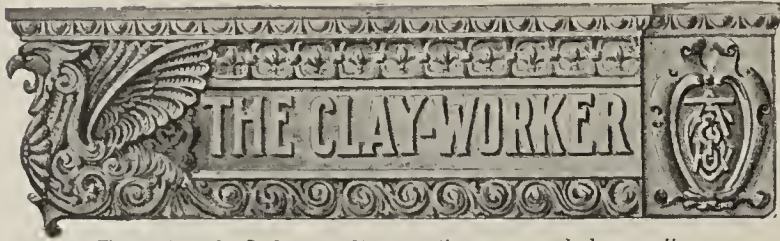
OTTO GIESSEN, for several years past a prominent figure in the paving brick industry, died at his home in Canton, O., Sunday morning, Feb. 21. Some three months ago he was taken down with la grippe. Being naturally healthy and vigorous, he regarded the attack lightly and ex-



THE LATE OTTO GIESSEN, OF CANTON, OHIO.

posed himself too soon, and the result was a relapse, from which he never recovered.

Mr. Giessen was born in Bavaria July 27, 1848, came to America nineteen years later and located at Cleveland. In 1873 he married Julia Audke, of Akron, and soon after moved to Canton, where he has since resided. He was a man of fine natural abilities and indomitable energy, and, though starting as a poor boy, acquired wealth and a commanding position in business circles. At the time of his death he was Manager, Secretary and Treasurer of the Royal Brick Company, President of the Crystal Springs Ice Company, besides being a stockholder and director in several other large concerns. His widow and six sons survive him. His was a cheerful as well as a forceful nature, and he numbered many warm friends among the brickmakers, particularly the members of the N. B. M. A., of which organization he was a staunch supporter; in fact, he favored whatever stood for progress, and was one of the first to send a son to Professor Orton's school for clayworkers at the Ohio State University.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVII. MARCH 1897. No 3.

CURRENT COMMENT.

There is nothing honorable or manly in assailing another by innuendo; it indicates malice as well as cowardice. Speak it right out if what you want to say is true, or hold your peace.

* * *

At the Zanesville Convention attention was called to the fact that the great technical progress in clayworking emanated from the West, and that Ohio, Indiana and Illinois have been leaders in the procession.

* * *

In the matter of fire-proofing Mr. James Taylor makes a graphic illustration. He says: "Porcelain bodies do not make good fire brick, nor does porous terra cotta make good wine bottles. Yet clay is the chief material in each of them. Clay for making fire-proofing material should be a low grade fire clay."

* * *

In the line of broadening the sphere of action, the Ohio Association changed its name, and will hereafter be known as the Clayworkers' Association of Ohio. This question was discussed at length, the general scope of the Association considered, and the disposition to broaden the field was unanimously echoed.

* * *

The intelligent consideration of the question of paving brick growing out of the work of the National Convention manifested itself in the meeting of the Ohio body. Altogether, the broad field covered by this Association contributed a great deal of valuable technical matter for the benefit of the clayworkers in America.

* * *

In this issue we publish the proceedings of the Convention of Clayworkers of the State of Nebraska. The progressive spirit which leads to the development of State organizations is to be commended. They are the natural offshoots of the national body, and by the educational work which must come

through these minor organizations each individual clayworker throughout the country will be benefited. All things must have a beginning, and in time we may expect to see a strong, permanent, helpful organization in the State of Nebraska. All States now without organizations should fall into line and develop permanent associations.

* * *

Roman brick, buff brick, colored brick, "any color but red," are being used in this city and elsewhere, not alone for general brick structures, but for brick work of the exposed parts of frame-house foundations. The manufacture of brick of this kind is a progressive industry, and the qualities which are being produced indicate a high development in the clayworker's art.

THE OHIO CONVENTION.

Ohio is a great clayworking State. Its development in ceramics, high grade porcelain ware, tiles of all kinds, artistic pottery, brick, terra cotta, sewer pipe, farm tiles, insulating material, have all been carried to a high state of perfection. There has been enough of competition in the State of Ohio to develop a high grade of work. There is no questioning the fact that the general civilization of Ohio ranks high. Its educational methods along all lines are advanced. When the clayworkers of Ohio come together, and when their proceedings are placed in the literature of clayworking, we may rest assured that we have been permanently benefited. The recent Convention, which assembled in that center of clay products, Zanesville, on the morning of Feb. 12, justified in its proceedings all that might have been expected of it.

ROOFING TILE.

How long, oh! how long, must we wait for the commercial, everyday roofing tile? There is no reason why tile should not be used exclusively in preference to slate. Slate is one of the most unsatisfactory materials known for a roof. It requires constant repair; it is difficult and expensive to repair; it is not calculated to withstand the extreme variations of temperature; the effect of heat upon it is absolutely disastrous, and, in truth, there is no good reason why slate should be used for roofing purposes. Clay is the ideal roofing material. It should be made into tile in many sections all over this country and placed upon the market. By many roofing tile is regarded as a product de luxe, a fad, a material which is used only in buildings of great cost, and a material having no large claim for adoption as a roofing material. Burned clay is everything which slate is not. It does not require attention in repairs; it is an absolutely fire-proof product; it is not necessarily expensive; it is beautiful in color, and altogether an everlasting material. Ohio has taken hold of this question in her Convention, and two admirable papers come to us from its proceedings, one by Albert V. Bleininger and the other by Mr. C. W. Crawford, the first being under title of "Roofing Tiles in the Fatherland," and the second entitled "Roofing Tiles and Their Manufacture." Both of these papers are of a highly practical character, going into the minutest details as to material and methods. We commend to the clayworkers of America these timely documents.

DRAIN TILE TO ROOF TILE.

Secretary Orton said, apropos of the question of roofing tile: "We have in Ohio something over five hundred drain tile companies, whose trade will have to decrease rather than increase, unless they find for themselves some business into which they may profitably direct their energy. I am not altogether clear in my own mind that roofing tile is the one which drain tile men should undertake, but it has been intimated to me that this is what they are looking toward." His statement with respect to the possible partial decadence of the drain tile business was misunderstood, and, in some instances, in a measure criticised. In truth, it must be apparent that it is possible that certain sections of the country have been fully drained, and therefore

all, in time, will have been supplied with drain tile. There can be an end to drain tile, but as long as men build roofs there will be a demand for roofing tile. It is not a question as to whether a drain tile man makes a roofing tile or not. It is a question of the supply of a common sense, practical roofing tile. Many forms are made all over the country and the world. The plain shingle tile is very successful and makes an admirable roof. There are dozens of successful patterns of interlocking tiles, and, as to pan tiles, they are as old as the roofs of the world. Ben Hur got into trouble by knocking a piece of a pan tile off a wall on the head of a Roman soldier. Roofing tile will come because it ought to come, because it is the best material to use for a roof. Nevertheless, the things which ought to be are a little slow sometimes.

BAD BRICK WORK.

In a new sky-scraper building which is being constructed in this city good bricks are used and are badly laid. No effort was made to get good joints, proper uniformity of color or a high grade of workmanship in other respects. It is a sad circumstance when good material, that which is expensive, is ruined through careless and inefficient workmanship. The common brick work on this structure is bad, indeed. The material is excellent, but the workmanship is the most careless and unsatisfactory that has been placed upon any pretentious structure during recent years. Indianapolis has been famous for good brick work. The high character of work done with rich colored common brick has been such as to almost entirely preclude the sale of red pressed brick in this market. With the introduction of new shapes and colors, however, this condition will soon have entirely changed. Some of our architects are disposed to say that red brick for high-class work is a thing of the past. In this they are wrong. After a season or two the fad will have passed and red brick will again have the call.

FIRE-PROOFING.

Architects generally understand the value of clay as a fire-proofing material. The little misunderstanding at the Buffalo Convention, no matter how it be distorted by the enemy, will cut no figure with them. A great deal of cement work has been used in connection with fire-proofing. Considerable has been used in this city for the fire-proofing of floors, and in no case has it proved mechanically satisfactory. In one structure, the Lemcke Building, a great deal of this material had to be condemned. In the Manual Training School Building much difficulty has been experienced. The Gas Company Building has been troublesome and is unsatisfactory on account of the cement fire-proofing. In other sections the same trouble has been experienced. The great fault to be found with clay-cement fire-proofing is that it depends upon too many conditions for satisfactory results. One cannot know that it is satisfactory until after it is finished and in position. Sometimes the imperfections show up quite awhile after the construction. When the material is covered by the floor no one can know its real condition. The elements of uncertainty with respect to fire-proofing are: First, the quality of the cement; second, the quality of sand; third, the knowledge as to the proportions to be used; fourth, the integrity of the mixer of the cement; fifth, watchfulness and attentiveness, even when integrity is unquestioned; sixth, the care of the material after it is placed in position and after it has set; seventh, the settling of the structure. Here are seven conditions. If all be not met satisfactorily the concrete fails. One does not know that all have been met until long after the material is in place. As to clay fire-proofing, there can be no uncertainty. The material is brought to the building. One may look at it and decide in a minute whether it is satisfactory or not as a material. One does not have to wait until it is in position or worse, accepted and paid for, until he knows. All of these conditions unfavorable to cement exist irrespective of the qualities of cement as a fire-proofing

material on general principles. In an experimental way, under the most favorable conditions, concrete fire-proofing has developed considerable strength; but in a large structure it is hardly possible but that some important proportion of cement fire-proofing should be defective. The strength of constructive work is estimated by its strength in its weakest parts. Clay fire-proofing is in no danger of being superseded in good practice. The possibility of knowing exactly what it is before it is placed in a building is sufficient to fix permanently its place in the building market. The architect who uses clay fire-proofing knows what he is getting. He is not accepting the responsibility of something which he cannot know.

THE OUTLOOK.

There come times when one wishes to look beyond the smoke of his own chimney or the narrow bounds of his present horizon, not only that he may know what already exists, but what is to be. Ordinarily, as to coming events, this can be only in so far as the occult laws which shape events can be relied upon to work to-day and to-morrow as they worked yesterday and the day before, and that they are not to be interfered with by some force whose existence is not discoverable. In the early days of last winter the Weather Bureau announced a fearful blizzard in the extreme Northwest, which was heading so directly for the Ohio valley that its coming was confidently expected at the time its known velocity indicated, but it never came. It was met in Minnesota by a current of hot air from the Southwest whose existence was not known to the Weather Bureau until it had deflected the blizzard into Canada or entirely dissipated it. Subject to such conditional influences, we venture to look out upon current events, not only to tell what they are, but to tell with much confidence what they mean as to the future.

A HOPEFUL VIEW.

First, as to the business matters at home, we have to record a continual improvement. It is great gain that we have come to realize the situation and to concede that our business woes are not wholly or even chiefly attributable to this or that economic measure or to the want of something the state might supply, but that overliving, overtrading, going in debt and the like are chief factors in the commercial disasters which have overtaken all alike, and that we have heroically undertaken to correct these mistakes without waiting for help from a source least able to help us. The fellowship of suffering in a calamity which has befallen all has produced a feeling of solidarity seldom known before in business matters, and the very effort to help others has increased individual strength and self-reliance until every heart beats with new energy, and, as a consequence, times are improving. An important factor in this upward tendency, it must be conceded, is the prevailing opinion that whatever change, if any, is made in governmental policies will be helpful, not harmful, to the many industries upon which national and individual wealth depends. Thus far our outlook is cheerful and hopeful.

PEEPING OVER THE BORDER LINES.

But our outlook takes a wider range than our own domestic affairs. We are a part of the family of nations, and whatever concerns the world concerns us, and, we ask, what of other people? There is not a reader of the Clay-Worker who does not feel an interest, for instance, in Cuba. What of Cuba, our near neighbor? Our horoscope responds emphatically, Cuba is to be free, and with equal emphasis it says that freedom is possibly to be aided, if not accomplished, by a war with Spain on our part. Realizing how perilous it is to forecast events which are liable to so many interruptions by forces no one can foresee, we nevertheless venture to say that complications are already in existence, not to mention some that are inevitable, which make war with Spain unavoidable, unless, like that unknown hot current of air which turned aside the blizzard, there

soon come to the front influences now not discernible. It is no disparagement to the late administration that it held back the human impulses of the American people and kept the dogs of war chained. That was wise, but Mr. Cleveland himself could not always do this, hence it must not be said that the new administration is less cautious or more belligerent because this event comes now instead of then. A sentiment so universal as that which demands the freedom of Cuba cannot be ignored or resisted. Cuba must be free, war with Spain or not, hence aggressive measures which might have been severely criticised eighteen months ago will not only be welcomed, but demanded in the near future. The barbarities of Spain must cease, not only as to our own people, but as to the Cubans as well.

THE SITUATION ABROAD.

Looking further from home, and almost contemporaneous, if not in its ultimate analysis, identical as to cause and effect as a part of one movement in the uplift of humanity, our eyes rest upon the war cloud whose center to-day is over little Greece, but whose circumference includes all Europe. At the hour of this writing the world is looking anxiously toward little Greece to see what will be the outcome of her answer to "the powers," who, for diplomatic reasons, have ordered her to let Crete remain under Turkish bondage, but the answer and the immediate result will have very little to do in shaping coming events. It is unthinkable that England, France and Italy will consent any longer to such cruelties against humanity as have characterized Turkish rule the last decade. In England and France in particular the people are the power behind the throne, even more than in America, and they are practically unanimous in demanding that Greece be let alone. But Greece will not be let alone. England, France and Italy, at least, if not Germany also, must, at the first, show a pretense of acquiescence in enforcing the edict of the powers, but, with the sentiment of their people so opposed, neither can long continue in a combine which sustains such barbarities.

But the treatment of the Christians by the Mussulman is only a surface indication. Turkey has been tolerated in Europe for a century only because of the jealousies of other nations. They are not willing to see any one of their number take the whole of it, and they cannot yet agree upon partitions. But events are culminating. The large war preparations which each of these nations have been making the past ten years mean more than a defensive policy. To be ready to defend means more than defense; it means aggression on the least provocation. That Russia wants a provocation which will be a plausible pretext for opening the Dardanelles to her commerce and navy no one doubts. That, after all, she is behind Greece in her present movement is more than probable, and that she will cut her way to the Mediterranean is certain. It is only a question of time. No compact with other nations can prevent it. So, if while reading this outlook the reader has just read in his morning paper that the spark has been applied to the magazine, and all Europe is in convulsions, let him lose no faith in the outcome. We on this side of the waters need care but little what are to be the future boundaries of European nations, but of one thing we may be sure: the war will end with the common people lifted higher and the rights of man better recognized. There are advance movements for the race which are made only through war; hence wars are not unmixed evils. On the whole, therefore, our outlook is full of promise at home and abroad.

Aaron H. Gould, of Brewer, Me., one of the oldest as well as one of the best brickmakers in that section, is considering the advisability of changing his method of making brick. He prefers the Quaker machine, and would like some sample green brick, just as they come from the Quaker, from some yard near Brewer. He would also like to receive figures for a horse and steam-power Quaker machine. We presume, however, that Mr. Gould would be pleased to hear from manufacturers of other machines as well as the Quaker.

A GOOD WORKING COMMITTEE.

T. A. RANDALL, Secretary N. B. M. A.,

DEAR SIR—Below I give you the names of the members I have selected for the Committee on Technical Education, in accordance to Mr. W. D. Richardson's resolutions as amended by Mr. Adams, see pages 130 and 154 of Official Report. Please announce same in the next CLAY-WORKER. Each of the gentlemen has signified a willingness to serve as best he can. I am sure they will prove a good working committee, and that we will hear a good report from them at our next convention.

Sincerely,

W. H. BRUSH, President.

BUFFALO, N. Y., March 12, 1897.

THE COMMITTEE.

Edward Orton, Jr., Columbus, Ohio.

W. D. Richardson, Cleveland, Ohio.

D. V. Purington, Chicago, Ills.

Chas. Bloomfield, New York City.

Anthony Ittner, St. Louis, Mo.

A GOOD MAN GONE WRONG.

Perhaps the adjective in the above heading might better be omitted, at any rate Mr. Alexander Batley, of Griffen, Ill., has gone wrong, and sadly wrong too, for in a communication to our juvenile contemporary under the caption "A Victim Remonstrates," he writes himself down a prevaricator of low degree. Referring to the hotel accommodations at our Buffalo Convention, he says:

"Except in the case of a very few favored ones who had the best rooms, there was universal dissatisfaction. I had what was called a room, but it had no windows in it, and was so small that in order to get at the washstand I had to drag the bed over to the 'room' door, and for this I had to pay \$3 a day. I know of six men being packed in one room (representatives of the American Clayworking Machinery Co.), who were charged \$18 a day. In another case three men (Simpson Brick Press Company) in one room, were charged \$9 per day. Conventions are always supposed to be favored, and not to have the ordinary rates put up on them. I feel very strongly about this, and firmly believe that the private interests of one man have been studied at the expense of the members of the Association."

This reads crooked on its face, for very few hotels have rooms without windows, and wishing to get at the facts, we wrote the Manager of the Tift House, asking for his side of the question, also to the American Clayworking Machinery Co., the latter say they had satisfactory quarters, that they found no fault with the Tift House either during or since the Convention, and that Mr. Batley used their name without their knowledge or consent. The Simpson Brick Press Co. say the same. The Manager of the Tift House replies as follows:

"T. A. RANDALL, Secretary N. B. M. A.:

DEAR SIR:—Yours of the 4th came duly to hand with enclosures, the reading of which afforded me more or less amusement. The room which Mr. Batley had was number 254, facing a court and with one window. It is not our best room, nor yet our worst, and our rate for same is \$3 per day. A man has got to be in the hotel business to realize how hard it is to please everybody, and, although I would like very much to answer Mr. Batley, do not consider it advisable, as life is too short to waste any time with such people. With kind regards, believe me

Yours very truly,

JOHN HOOD,

Manager The New Tift House."

It is passing strange that a man of Mr. Batley's intelligence should lend himself to such an ignoble scheme, the only aim and object of which is to cause discord, and still more so, that he would resort to falsehood and innuendo in order to bolster up his "kick." Mr. Batley has a right to lie about and for himself if he wants to, perhaps, but he has no right to connect the names of reputable firms with his own in such a manner and for such a purpose. Indeed, his motive is hard to divine. We are constrained to believe that he is a victim of our Chicago Svengali.

We have made diligent inquiry of those who were at Buffalo and have not found a single one who has any fault to find with

the hotel accommodations during the convention, all agreeing that, everything considered, those having that matter in charge acted wisely in making the Tifft House headquarters. As Mr. Hood says, it is impossible to please everybody, but he and his assistants did their level best. We know the members generally were well satisfied, much more so than they would have been had we gone to the Iroquois and paid \$4 to \$5 a day for service little better. Evidently, "Svengali" will have to try some other scheme to inject discord in the ranks of the N. B. M. A.

TRADE LITERATURE.

A NEAT LITTLE BOOKLET has been received from W. A. Eudaly, Cincinnati. It is entitled "Practical Thoughts for Brickmakers," and contains valuable hints on planning and building brick plants, and a few illustrations of ground plans for works which have been erected under Mr. Eudaly's supervision. There are chapters on "Annealing Clay Wares," "Principles of Combustion," "Utilizing the Waste Heat from Kilns," etc. A copy can be had for the asking.

A CATALOGUE of fire brick comes from the Crown Fire Clay Co., Akron, Ohio. In addition to the list and illustrations of the shape brick and blocks they make in almost endless variety, the little book, which is intended for pocket use, contains a number of interesting tables showing the number of arch, key and wedge brick required for various circles, the arch and circumference of circles, melting points of various metals, temperatures required in burning various clay wares, etc. Presume they will mail a copy to any of our readers who will write for it.

A PERFECT SYSTEM of Combination Up and Down Draft Kilns, is the theme of an odd little pamphlet issued by S. H. Alsip, Belleville, Ills., the well-known inventor and builder of the Alsip kiln. It tells of the comparative value of coal and wood as fuel, gives valuable "Pointers in Watersmoking or Drying Brick in Arch Kilns," and shows small outline drawings of his square kiln. If you want a copy drop Mr. Alsip a postal card.

"OURS HAVE THE CHARM," is the announcement on the front page of an attractive leaflet, for which we are indebted to the Philadelphia and Boston Face Brick Co., Boston, Mass. This firm has become famous throughout America by the production of fine face brick for ornamental work. Their brick fire-place mantels are designed by artists and are in fact, joys forever. A dozen beautiful designs of moderate cost mantels are shown in this leaflet, which will prove particularly interesting to those who are building homes for themselves.

SOFT MUD OR TEMPERED CLAY MACHINERY and Brick Yard Appliances of every kind and character are well illustrated in the 1897 catalogue issued by the Henry Martin Brick Machinery Manufacturing Co., Lancaster, Pa. Mr. Henry Martin is a pioneer in this branch of the brick business having been engaged in it for nearly half a century. He is progressive too, as the reader may see by getting a copy of this new catalogue which shows all the up-to-date Martin brick machinery.

A NEW CHIMNEY TOP is shown and described in a small six page folder being sent out by the Excelsior Fire Clay Co., Lisbon, Ohio, the manufacturers, who claim that it is the only chimney top made that will prevent the wind blowing soot and smoke down a chimney. With this top the draft of a chimney must always be upward. If you want to know more about it write them for a folder.

SOUVENIR BRICKS BY THE MILLION.

An Expensive Private Exhibit to be Erected on the Tennessee Exposition Grounds.

Chambers Bros. Company, Philadelphia, have begun the erection on the Centennial grounds at Nashville of their big brickmaking plant. It is situated between the Machinery and Agricultural Buildings, is 40x80 feet, and will comprise two end cut brick machines, one repress for street paving and pressed front bricks, and one side cut brick machine. They will give away as souvenirs two million toy bricks, and will exhibit the golden miniature engine. The exhibit will cost from \$15,000 to \$20,000, and has been given a prominent location. The building will be fire-proof, being erected of corrugated iron.

Jos. Jackson, proprietor of the Millington (Ill.), Brick and Tile Co., died at his home in Millington, March 12, at the age of 72 years.

If you are looking for good second-hand machinery read the "ads." in our "For Sale" column.

FLATTERING ORDERS.

While trade in clayworking machinery is not as brisk as it has been in past years, still there are orders being placed, as is evinced by a glance at the order book of the American Clay-working Machinery Company. This firm seems to get its share, even though others are idle. During the past month the working force of the company has been doubled and extra hours put in. The following are among the orders recently received at the Bucyrus office:

Sayre & Fisher Company, of Sayreville, N. J., have ordered a complete plant. The outfit will include a stiff mud machine, automatic cutting table, pug mill, granulator and crusher.

O. H. Nordstrom, of Punxsutawney, Pa., will improve their plant by putting in an auger brick machine, cutting table, pug mill, dry pan, screen, elevators and a complete power plant.

E. A. Humphries, of Scottdale, Pa., will be better equipped for the season's business with a complete plant. His order includes an auger brick machine, cutting table, dry pan, pug mill, screens, etc.

The company has received an order from J. A. Hutchins & Co., of Wyoming, Pa. They have ordered two seven-foot wet pans.

The Darlington Coal and Clayworking Company, of Darlington, Pa., has placed its order for an auger machine, automatic cutting table, pug mill, repress, and, in fact, a complete outfit.

The Coplay Cement Company, of Allentown, Pa., has placed an order for eighty drying cars.

The Coffeyville Vitrified Brick Company, of Coffeyville, Kan., will be more fully prepared to handle their splendid trade by the addition of a new lot of machinery. The order includes a pug mill, automatic cutting table, repress, elevators and twenty special cars.

Myers Bros., of Elkhart, Ind., have ordered a stiff mud machine, cutting table, pug mill, crusher and a power outfit. The Myers Bros. will be equipped for the season's work.

Pitkin & Co., Forest City, Ia., will put in a new tile machine, with the necessary dies, cutting table and crusher.

N. B. Wheeler, of Cresco, Ia., will put in a new disintegrator and elevators.

The Camden Clay Company, of Spilman, W. Va., has added a new repress to its plant.

WANTS SECOND-HAND MACHINERY.

Publishers Clay-Worker:

Inclosed you will find a check for \$2 for the Clay-Worker. I would like to buy a second-hand Potts mold sanding machine and one 80-horse-power boiler and one 75-horse-power engine, in good condition, and must be cheap for cash.

Seranton, Pa.

MATHIAS STIPP.

WILL MAKE PRESS BRICK.

Editor Clay-Worker:

Inclosed please find renewal for subscription to the Clay-Worker for 1897. Our yard is the property of the Radford Pipe and Foundry Company, and we are lessees. The works are first-class, with a tempered clay brick machine, three Morrison kilns and a fine yard. We hope in the near future to put in a dry press machine for the manufacture of fancy colored face brick, as we have a superior buff clay adapted to this work. We will also erect a down-draft kiln. We may be able to do this the coming season, if our business merits it.

THE ENTERPRISE CONTRACTING COMPANY.

Radford, Pa.

ARE YOU GOING TO TRAVEL THIS SUMMER?

If you have decided in the affirmative, and wish to gather a comprehensive idea of the very best summer resorts in the Northern United States, the great lakes region and Canada, you can obtain satisfactory information by sending 4 cents in postage stamps to Mr. D. G. Edwards, Passenger Traffic Manager C. & D. Railway, Cincinnati, O., who will, in return, send you a copy of "A Michigan Romance," an attractive story by Stanley Waterloo, containing, also, full information about the summer resorts of the great north. The intelligent traveler will appreciate this work. The C. & D. Railway has also under preparation another series of books for the coming summer.

The immense plant of the Coaldale (Ala.) Brick and Tile Company is in active operation, with a full force and an unusually rushing demand. Inquiries have recently been received from several South American ports for prices f. o. b. vessel on special design brick of their manufacture.

TABLE OF CONTENTS.

Terra Cotta in Philadelphia		Hollow Ware	270
Architecture	237	Officers Elected.....	270
Dust in Porcelain Potteries.....	238	Resolutions.....	270
Clay Insulation	239	An Improved Clay Disintegra-	
The Value of Clay Products	239	tor	271
Foreign News Notes.....	240	Something New In Clay.....	271
In Deutschland.....	241	The Genuine and the Counter-	
		feit.....	271
OHIO ASSOCIATION.		Testing Paving Brick.....	272
18th Annual Convention.....	244	A Busy Plant.....	272
Welcomed to Zanesville.....	244	Galesburg Pottery	273
President Bigelow's Address	245		
A Review of 1896—and Now		CORRESPONDENCE:	
What?	245	A Good Example.....	267
Roofing Tiles in the Fatherland	246	Likes the Clay-Worker.....	270
Roofing Tiles and Their Manu-		Button-Hole Talks.....	274
facture	248	Philadelphia Brickmakers Get	
Side Issues	249	Together	274
The Question Box	252	Roofing Tile Discussion at Buf-	
Why Does a Glaze Composed		falo	274
of Albany Slip Never Craze... 252		As Others See Us.....	275
SECOND SESSION.		Impression of the Buffalo Con-	
Our Association.....	253	vention	275
The Clay Industry—Now and		The Up and Down-Draft Kiln... 275	
Then	254	The New York Market.....	275a
A New Name.....	255	Pacific Coast News.....	275a
Committee on Nominations.....	258	Southern Trade Notes.....	275a
Does Repressing Increase the		Detroit News.....	275b
the Wearing Power of a Pav-		Ohio Valley News.....	275b
ing Brick?.....	258	Obituary—Death of Otto Geis-	
Committee on Constitution.....	259	sen and Samuel F. Seiden.....	275b
What is the Cheapest Glaze for		Wants Second-hand Machinery 277	
Roofing Tiles?.....	259	Will Make Press Brick.....	277
Does the Speed of Drying Affect			
the "Whitewashing" of Brick 260		EDITORIAL:	
THIRD SESSION.		Current Comment.....	275c
Porosity and Frost Resistance		The Ohio Convention.....	275c
in Clay Wares	261	Roofing Tile	275c
Difference Between Pottery		Drain Tile to Roof Tile	275c
Bodies and Common Clays... 263		Bad Brick Work.....	275d
Pyrometric Cones.....	264	Fire-Proofing	275d
The Question Box.....	265	The Outlook	275d
Election of Officers	266	A Hopeful View.....	275d
Constitution and By-Laws	266	Peeping Over the Border Lines 275d	
Visiting Zanesville's Clay Man-		The Situation Abroad.....	276
ufactories	267	A Good Working Committee... 276	
		A Good Man Gone Wrong.....	276
NEBRASKA ASSOCIATION.		Trade Literature.....	277
President's Annual Address.....	268	Editorial Notes and Clippings.. 280	
Reports of Committees.....	268		
Setting and Burning Brick	268	MISCELLANY:	
Mixing and Drying Clay	269	A Brickyard on Corbett.....	272
		Souvenir Brick by the Million.. 277	
		Flattering Orders.....	277

BOOKS FOR BRICKMAKERS.

"CLAY GLAZES AND ENAMELS,"	
Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	
Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	
J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	
Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	
H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	
J. J. W. Billingsley,	1.00

Mailed, postage free, on receipt of price. Address

T. A. RANDALL & CO.,
Indianapolis, Ind.

INDEX TO ADVERTISEMENTS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page
Hilgeman H. B.	234	The American Clay-Working	
Ross-Keller Brick Machine Co.	232	Machinery Co.	304, 305
Simpson Brick Press Co.	230	The Fernholtz Brick Press Co.	231
The Chisholm, Boyd & White Co.,		Whitney, H. O.	234
.....	228, 229		

Brick and Tile Machinery.

Adrian Brick & Tile Machine Co.	295	Steele, J. C., & Son.....	295
Anderson F'dry & Mach. Wks.	307	Tallcot & Co., W. E.	308
Baird & Son, H. C.	287	The American Clay-Working	
Brewer, H. & Co.	293, 313	Machinery Co.	304, 305
Central Machine Works.....	281, 288	The Horton Mfg. Co.	306
Chambers Brothers Co.	225	The Eastern Machinery Co.	314
Craycroft Benj.	285	The Henry Martin Brick Mach.	
Chicago Brick Machinery Co.	300	Mfg. Co.	310
Eagle Iron Works.....	288	The Leader Mfg. Co.	300
Freese, E. M. & Co.	312	The Ohio Ceramic Engineering	
Hensley, J. W.	286	Co.	298
Kells & Sons.....	287	The Turner, Vangh & Taylor Co	
Means & Co., Jas.	290	.....	311
Michigan Brick and Tile Ma-		The Wallace Mfg. Co.	284, 315
chine Co.	291	The Wellington Machine Co.	283
Newell Universal Mill Co.	302	Williams & Co., M. F.	233
Potts & Co., C. & A.	235, 299, 302	Wiles, A. M. & W. H.	294
Raymond & Co., C. W.	279	Woolley Foundry & Machine	
Stedman's Machine Works.....	295	Works.....	309
		Williams, White & Co.	298

Brick Kilns and Dryers.

Aisip, S. H.	296	Reppell, L. H.	298
Conley & Wolfe.....	296	Sharer, Geo. W.	226
Cummer & Son Co, The F. D.	282	Swift, F. E.	287
Eudaly, W. A.	297	Thaison, A.	285
Hundt & Co, F.	289	The American Blower Co.	290
Leary, W. A.	292	The Fernholtz Brick Press Co.	231
Morrison & Co., R. B.	297	The Standard Dry Klin Co.	236
Pike, E. M.	290	Wolff Dryer Co.	316
Phillips, S. G.	292		

Brick Yard Supplies.

Arnold, D. J. C.	301	Mershon & Co., W. B.	227
Buck, J. A.	293	Newton, A. H.	289
Coldewe & Co., G.	289	Phillips & McLaren.....	291
Carnell, Geo.	294	The Atlas Bolt & Screw Co.	299
Cox, Geo. S.	291	The Harrington & King Perfor-	
Caldwell, H. W. & Son Co.	285	ating Co.	227
Hardin, Bailey & Church.....	286	Wagoner, M. V. B.	291
Marion Steam Shovel Co.	301	Walworth Run Foundry Co.	294
Mey, F. H. C.	286		

Miscellaneous.

Ailis, F. H.	288	Osborne, W. R.	289
Associated Trade & Industrial		Rochester Optical Co.	290
Press.....	292	Ropkey Mason Engraving Co.	296
Balsley, G. S.	290	Tennille, A. F.	289
Dean Bros. Steam Pump Works 288		The E. W. Vanduzen Co.	292
Dover Fire Brick Co.	287	The Encyclopedia Publishing	
Evens & Howard	291	Co.	303
International Correspondence		The Union Hardware Co.	289
Schools.....	291	The Jeffrey Manufacturing Co.	290
Jackson, John H.	288	The Rockwood Mfg. Co.	289
Main Belting Co.	292	Small Ads., Wanted, For Sale, Etc	

WANTED—A brick burner for Continuous Kiln. One who understands the Radford Kiln preferred. Address,
31 d BUTTE SEWER PIPE AND TILE CO., Butte, Mont.

TWO LEASE—Eight acres brick clay, fifteen feet thick, no cover. Within city limits, one mile from center, on asphalted street. Only one yard in this city of 60,000. Address
31 c LUEDER BROS., Wilkes-Barre, Pa.

FOR SALE—At less than half price, one Penfield Stock Brick Machine and Pug Mill for sand moulded brick, with all Pulleys. In good order and ready for making brick. Reason for selling, changed to stiff mud. Address
3 t f d "FACE," care Clay-Worker.

WANTED—Practical man to superintend brickyard. Should have some capital to invest. Good shipping facilities. Capacity 20,000. Steam power plant. Cream colored brick. Address
31 c F. MAASS, 700 Backer ave, Menominee, Mich.

WANTED—Practical man in every detail of brickmaking by different processes desires to correspond with some company wanting such. Would buy small interest in good location. Competent to erect plants, and guarantee satisfaction from start. Terms reasonable.
311 p HYRUM, care Clay-Worker.

Continued on Page 285.

Success

Comes to Those Who use the Most Successful Appliances.

A Smiling Satisfaction. 

COLUMBUS, GA., March 25, 1896.

C. W. RAYMOND & CO., Dayton, Ohio,

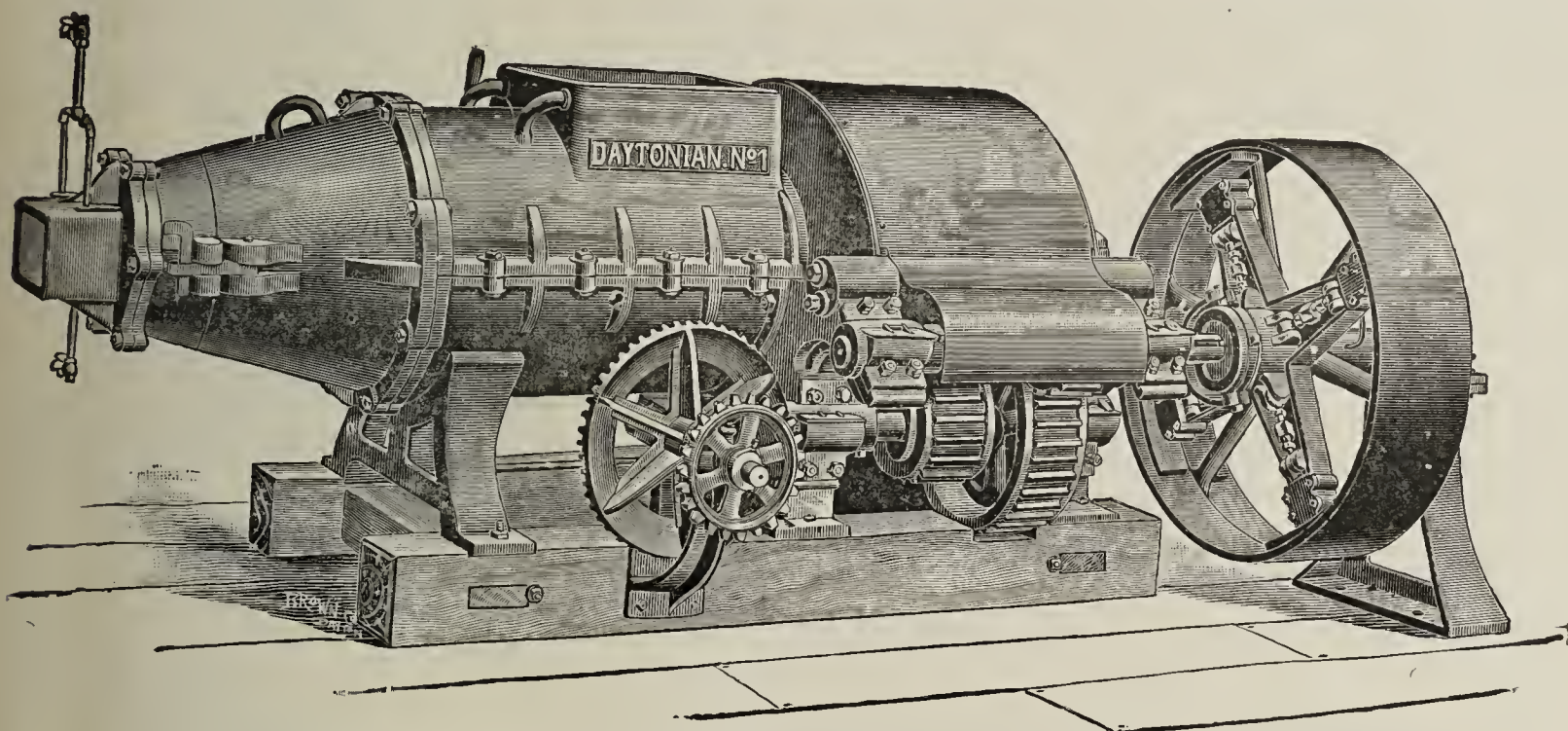
Gentlemen:—We are running the Brick Machinery purchased of you, and are delighted with its work. The Pug Mill tempers the clay and mixes it thoroughly. The Brick Machine turns out a first-class brick, smooth and square, and with well defined corners and edges. In fact it is just what we have needed for three or four years. We are now in a position to compete with any brickmaker in the country.

Your Daytonian No. 1, cannot be beat, and we take pleasure in testifying to its merits.

There are four other machines at work in our neighborhood. We would not exchange for any of them.

Very respectfully yours,

SHEPHERD BROS.



NO. 1 DAYTONIAN BRICK MACHINE.

COLUMBUS, GA., March 4th, 1897.

C. W. RAYMOND & CO., Dayton, Ohio.

Gentlemen:—We have never sent a check to any one with more willingness and pleasure than we do this one, because we feel and know that we have full value received in the machinery we have bought of you. We have been running the full outfit, viz.: the No. 1 Daytonian and No. 2 Pug Mill, Disintegrator, Elevator and Triumph Side-cut-extension off-carrier table just one year and we can truthfully say that we are fully satisfied.

Everything runs smoothly and the way the machine turns out brick is simply beautiful—we are using six off-bearing trucks and it keeps them very busy to take the brick out of the way. We are “in the swim” now and if you do ever come to Columbus, come out to see us and we will show you one of the prettiest little brickyards anywhere in this State.

Very respectfully,

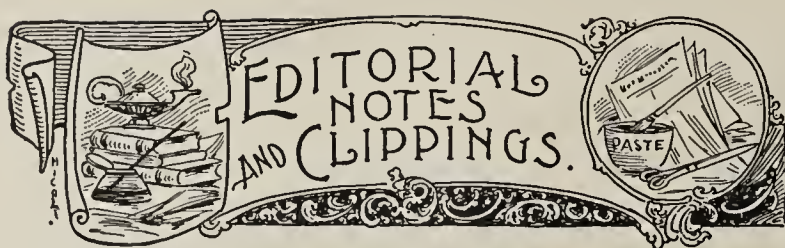
SHEPHERD BROS.

The above firm is only one of the many who say that Raymond Machinery is the most successful on the market.

C. W. RAYMOND & CO.,

Send for our 1897 Catalogue.

DAYTON, OHIO, U. S. A.



T. A. Armstrong has purchased a brickyard at Mace, Ind.

Mr. Waldvogel contemplates establishing a tile factory at Jericho, Mo.

Jno. McNeil contemplates the establishment of a brickyard at Lowell, O.

There is a movement on foot to establish a tile factory at Tupelo, Tenn.

L. F. Hart will operate the brick plant at Pine Lake, Minn., the coming season.

P. C. Miller, formerly of Brunswick, Ga., will establish a brickyard at Lulaton, Ga.

T. E. Mayes, Dalton City, Ill., expects to begin work at his tile factory in a short time.

We are advised that J. H. Northcut, Altamont, Tenn., expects to go into the brick business in the spring.

As soon as spring fairly sets in Thos. Larkins will start a new brickyard at Delray, Mich.

Good men looking for first-class situations should try a line or two in our "Wanted" columns.

Dr. Smith has purchased the interest of C. C. Jenkins in the tile factory at Brookston, Ind.

Jas. R. Miles has purchased the brick manufacturing plant of W. A. Gawthrop, of West Chester, Pa.

A. J. Lutman and Henry Diefenthaler have purchased ground at Millbury, O., on which they will erect a tile factory soon.

F. M. Gardner, formerly with the Windom (Minn.) Brick and Tile Company, will start a brick plant at Bingham Lake, Minn.

Geo. Iliff, of Elizabethtown, Ill., desires to purchase a second-hand horse-power brick machine. He says it must be sold cheap.

We are advised by Kanne Bros., Peoria, Ill., that they intend to start a brick plant and are in the market for soft clay machinery.

A rich deposit of fine clay, suitable for the manufacture of terra cotta, has been discovered on the farm of Wm. Schemann, of Reading, O.

A. J. Mosier has sold his brickyard at Alamosa, Col., to Jack Marsh, who will begin to manufacture brick as soon as spring trade opens up.

Baker, Heatt & Co. have lately purchased an old brickyard at Wenatchee, Wash., and as soon as weather will permit will begin operations.

Andrew Tycksen is making a number of improvements at his brickyard at Bradford, Ill., among other things putting in a new brick machine.

The Guyasuta Brick Company's plant, at Sharpsburg, Pa., was quite badly damaged by fire March 1. The flames started from an overheated kiln.

Chas. Nolin is moving his brickmaking plant from Trade Lake to Grantsburg, Wis., and expects to begin operations at the latter place early in the spring.

The brick works of S. Barnes & Co., Beaver, Pa., were badly damaged by the recent flood, the kilns and large drying floor being completely surrounded by water.

The Townsend Brick Company, Zanesville, O., have just closed a big contract for paving brick for Marietta, and are running their plant with a full force of employees.

Geo. C. Davison is making improvements at his brick plant at Tyrone, Pa., putting in a new machine, etc., that will enable him to increase his capacity to 20,000 brick daily.

Mr. Taman is making preparations to start a brickyard on Huron Road, Clinton, Ontario. His clay is of superior quality, and he expects to be kept busy filling the demand for first-class brick.

Any one desiring to invest in an Eastern brickyard will do well to read the advertisement of the property for sale by Samuel Taylor, Hackensack, N. J., mentioned in the "For Sale" department.

J. M. Starbuck, of Cherokee, Ia., has just secured a contract to furnish the brick for the new asylum, which calls for 900,000 brick on demand and 1,000,000 a month until the building is

completed. Mr. Starbuck will at once make preparations to increase the capacity of his plant, and will put up new drying sheds, etc.

Brush Bros., of Buffalo, have recently remodeled their drier to the American Blower Company system, with splendid success. The Harbison & Walker Company, Woodland, Pa., have done the same.

Do you want a good superintendent, foreman, setter or burner? If you do, you had better look over our "Wanted" "ads." If you don't find what you want, try a card in that department on your own account.

The Riverside Brick Company, though comparatively a young concern, has built up such a large trade that they have been compelled to increase the drying capacity of their plant at Earleigh Heights, Md.

The Green & Hunter Brick Company has been incorporated to manufacture brick at Thurber, Tex., by R. D. Hunter, Jas. Green, M. Rumsey, R. H. Ward and S. Mims. They have a capital stock of \$100,000.

A. C. Ochs, Springfield, Minn., in anticipation of a big demand for brick this spring, is building immense drying sheds at his brickyard. Mr. Ochs says he expects to do a large business the coming season.

Baker Bros. & Houck are making preparations at their plant at Buffalo, Tex., to turn out a large quantity of brick the coming season, as that town expects to make a large number of improvements this summer.

The Standard Brick Works, Little Rock, Ark., under the management of Mr. E. N. Weigel, are now in full operation. They claim to have one of the largest and best equipped brick-making plants in the Southwest.

Walter H. Wilcox writes that he would like to correspond with parties making a good artificial filter stone. He is looking for an article of that kind to put on the market. Mr. Wilcox's address is 3536 Page avenue, St. Louis, Mo.

Owing to a number of fires recently at Astoria, Ill., there will be a number of large buildings put up there this summer, so writes Jas. Horner, of that place, and as a consequence Mr. Horner expects to have all he can do to fill the demand.

The Vitriified Brick and Tile Company, Coffeyville, Kan., will expend something like \$8,000 in improving their brick plant. A complete equipment of modern machinery has been purchased that will enable them to turn out 50,000 brick daily.

The Main Belting Company, Chicago, Ill., have removed from 248 Randolph street, on account of their office at that place having been destroyed by fire, to 55 and 57 West Market street, where they will be glad to welcome their friends at any time.

Now is the time manufacturers are cleaning up their yards preparatory to the spring opening. If you have any good second-hand machines you want to get rid of, or want to buy anything of that sort, try a line in our "For Sale," "Wanted," etc., columns.

Messrs. Myers & Bush, a new brick manufacturing firm in Philadelphia, are installing a large American Blower Company drier. Messrs. R. C. Remmey & Son, also of Philadelphia, have just completed a dryer of the same make and have it in successful operation.

Jas. McNeen, La Junta, Col., is looking for a machine for grinding brick after they are burned, such as grinding them wedge-shaped for jack arches, etc., and will be glad to correspond with any one who can give him any information regarding such a machine.

Dr. E. L. Cox has a splendid bed of clay at Jacksonville, N. C., and would be pleased to correspond with an experienced brick manufacturer who would be willing to go down there and open up a brickyard. He says he will make liberal propositions to a good man.

The New Kensington Brick Company, Pittsburg, Pa., recently booked an order for 8,000,000 brick to be used in the construction of a long tunnel on the Pittsburg, Bessemer & Lake Erie Railroad. They expect to deliver the brick at the rate of ten carloads per day.

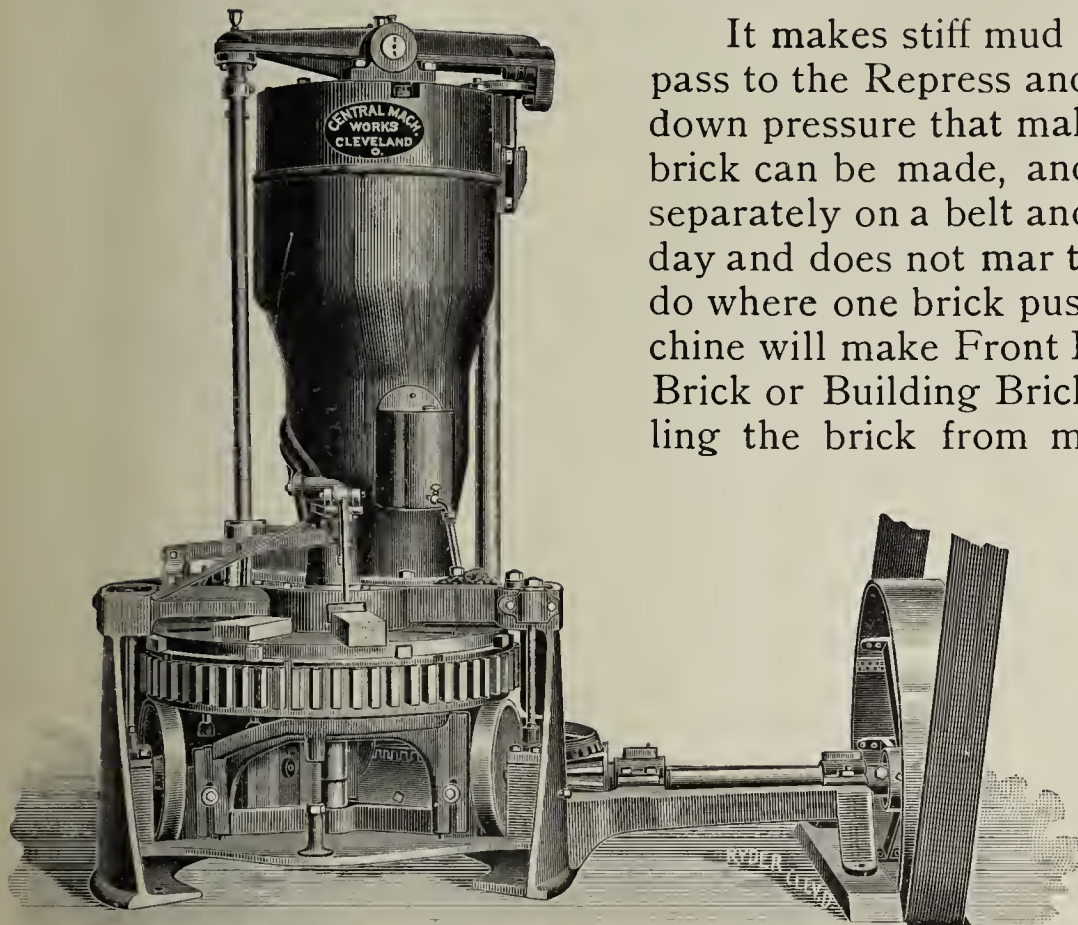
The Lorain (O.) Brick Company advise us that the item going the rounds of the press to the effect that they had sold their machinery and gone out of the business is false. They add that they desire it understood they are in the business to stay, and that prospects for the coming season are good.

Wm. Hutton, a well-known citizen of Kingston, N. J., died at his home, Evergreen Manor, the 2d of March. Mr. Hutton was an extensive brick manufacturer, and had been engaged in the business a number of years. In speaking of his demise a local paper says: "In the death of Mr. Hutton this city loses one of its foremost business men. He was of a genial disposi-

[CONTINUED ON PAGE 282.]

Please Notice—

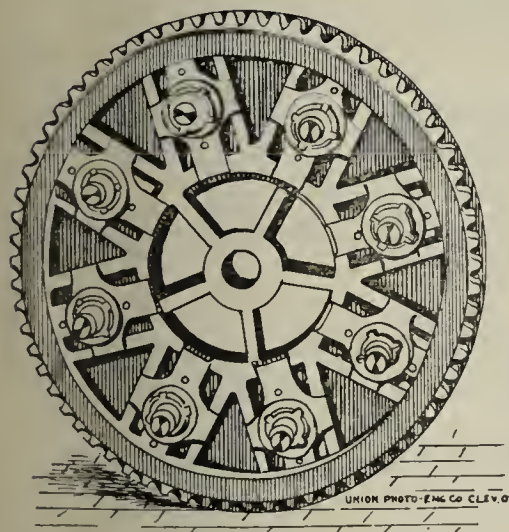
The J. N. K. Brick Machine With Repress Combined.



It makes stiff mud brick first and then the brick pass to the Repress and are repressed with an up and down pressure that makes them as hard as stiff mud brick can be made, and then it delivers each brick separately on a belt and will make 25,000 to 30,000 a day and does not mar the Brick as other Represses do where one brick pushes off the other. This machine will make Front Brick, Paving Brick and Fire Brick or Building Brick and save all labor of handling the brick from machine to Repress as all the

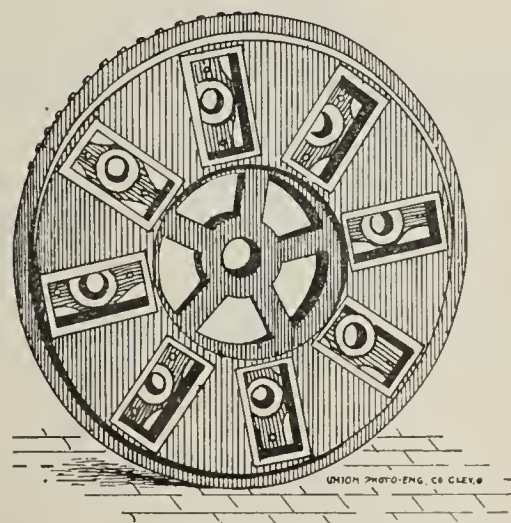
work is done on the one machine, and there is less machinery about this double machine and takes less power and less money to make repressed brick than any other line of brick machinery. All brick are repressed in the same die they are formed in, and by this process and the keeping of the brick separate we can make

and repress about one-third more brick in ten hours than other represses will repress.



Mold Wheel or Mold Table,

To fit all Brick Machines made after the style of the P. L. Sword Machine and all other repairs for the same make of machine we will furnish all the above repairs including Mold Wheel at a larger discount than ever before. Don't fail to get our prices.



The Central Machine Works,

226-236 Abbey Street,

CLEVELAND, OHIO.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

tion, well liked by all who knew him, and was very fond of his home and family circle. He was possessed of quiet habits, and always had a hospitable welcome for his friends who visited him. In business and social circles he will be greatly missed."

The brick plant of Conrad Kaltenbach, at West Reading, Pa., was almost completely destroyed by fire the night of March 5. The only buildings saved were the rack sheds. Mr. Kaltenbach estimates his loss at about \$3,000, with no insurance. The fire is supposed to be of incendiary origin.

Geo. Agner, of Rochester, N. Y., who recently sold his brickyard property to a Rochester firm, has purchased the land adjoining the old site, to which place he is removing his brickyard paraphernalia, and will erect a large and improved brick plant that will be modern in every particular.

Isaac Van Leuven, of the Goshen (N. Y.) Brick and Tile Works, has purchased a complete equipment of brick machinery, which he expects to have in full working operation by the 1st of April. Mr. Van Leuven intends to turn out a larger quantity of brick than usual the coming season.

All of the clayworking establishments of Uhrichsville, O., including the Diamond Fire Clay Company, Uhrichsville Fire Clay Company, Buckeye Fire Clay Company, J. J. Mazurie Tile and Sewer Pipe Works and the Advance Brick Works, have resumed operations, giving employment to over two hundred men.

The old Seneca River Brick Company, Syracuse, N. Y., has been reorganized, and will hereafter be known as the Riverside Brick Company, which has filed articles of incorporation, with a capital stock of \$30,000. The Directors are W. Porter, Joseph M. Sherwood, Samuel S. Rustin, Charles D. Brockway and Charles Foreman.

Jas. W. Hensley, Indianapolis, who succeeded to the business of S. K. Fletcher (see ad. on page 286), with whom he was connected for a number of years, reports a satisfactory trade in Quaker and Monarch brick machines. He has recently booked several orders, including one for a new Monarch outfit for the Tennessee Brick Company. It was this company with which Mr. Hensley's cousin, Jno. Hensley, was employed a few years since. Both "John" and "Jim" have a wide acquaintance among brickmakers throughout the country, the former having

also been in Mr. Fletcher's employ some years since. They look enough alike to be brothers, but are not. "Jim" would like to know the present address of "John."

The death of Mr. Young O. Wilson, the well-known brick manufacturer, of Baltimore, Md., occurred at the Johns Hopkins Hospital Feb. 17. Mr. Wilson went to Baltimore when quite a young man and immediately founded the Young O. Wilson Brick Company, of which firm he was the senior member at the time of his death. A widow, one daughter and two sons survive him.

Capt. A. H. Martine is making an effort to organize a company to purchase the Garnkirk Brick Plant, near Middleboro, Ky. Other citizens are interested, and it is likely the organization will be effected and the factory repaired and improved and a first-class plant made of it. The demand for brick is good throughout that section, and it is thought the venture would prove a successful one.

At the annual meeting of the stockholders of the Springfield (Ill.) Paving Brick Company, held March 5, the following Board of Directors was re-elected: A. L. Converse, J. F. Miller, S. D. Scholes, E. D. Keyes, J. L. Mason, Herman Pierik and G. J. Little. They, in turn, elected officers for the ensuing year, as follows: President, Dr. A. L. Converse; Vice President, J. L. Mason; Secretary, S. D. Scholes; Treasurer, Herman Pierik.

W. E. Sidney, who for several years past has been connected with the Davenport Paving Brick and Tile Company, at Buffalo, Ia., writes us that he has resigned his position with that company to accept that of Manager of the Jamestown (N. Y.) Shale Paving Brick Company, and will take charge April 1. The latter plant is being rebuilt, and, when completed, will be modern in every particular, and have a capacity of 100,000 brick per day.

A new brick company has been incorporated at Washington, D. C., under the laws of the District, to be known as the Electric Brick Company. Capital stock, \$100,000, in two thousand equal shares of the par value of \$50 each. The incorporators are: Franklin H. Herr, Hannibal D. Norton, William A. Bantz, Herman D. Walbridge and Albert M. Cowell. Officers: President, Herman D. Walbridge; Vice President, Franklin H. Herr; Secretary and Treasurer, Hannibal D. Norton; Manager, William A. Bantz, and Superintendent, Albert M. Cowell. The company will manufacture and sell bricks and terra cotta of all kinds, shapes, sizes, colors and descriptions.

THE CUMMER DRYERS, For Drying Brick and Clay.



Using the mingled products of the fire and air or hot-air alone.
Both systems equally economical.

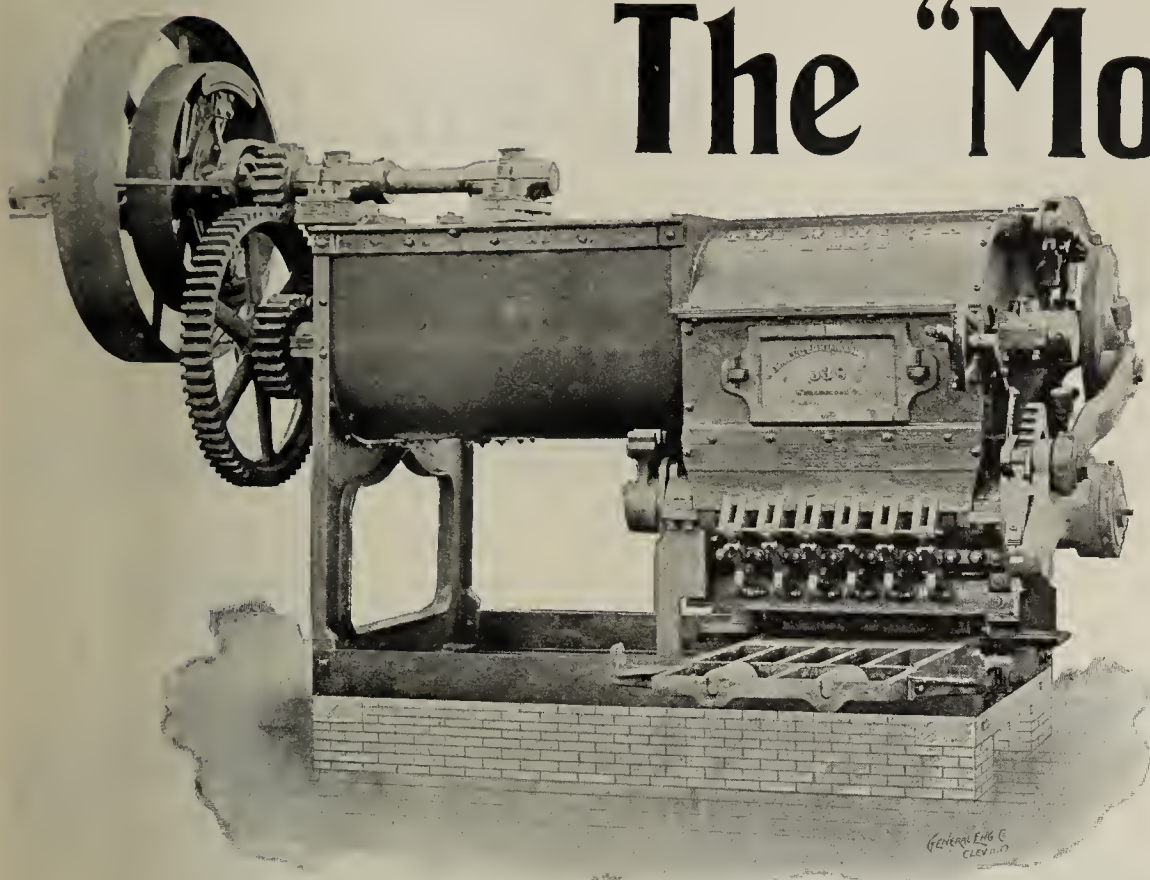
No Boilers. No Pipes. No Complications.

Great Capacity. Extreme Economy.

If we knew your Address, we would Send you a Catalogue.

The F. D. Cummer & Son Co.,

CLEVELAND, OHIO.



The "Monarch"

(Horizontal,
Double Pug Mill,
Double Press.)

... and ...

—• THE —

"Iron Quaker" Brick Machines

Lead the "Sand-Moulding" Class.

AUXILLIARY
MACHINES
AND ...
SUPPLIES.

Pug-Mills, Disintegrators, Crushers,
Mould - Sanders, Represses, Winding
Drums, Dump Cars, etc., Moulds, Dump
Tables, Dryer Cars, Kiln Doors and Cast-
ings, Elevators, Dump Carts, etc., etc.



Ball-Bearing Brick Barrows and Trucks.
No one else makes them.

FOR SALE.

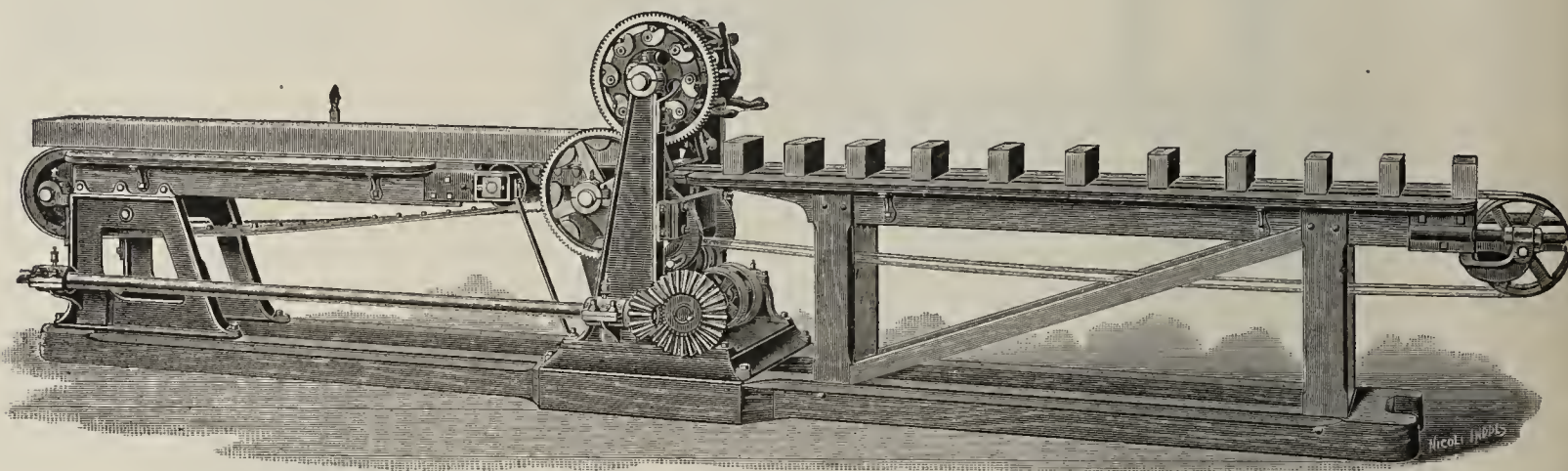
Odd sizes of moulds. Have not been used.
5 moulds, $8\frac{1}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
20 moulds, $8\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 in. partitions.

Second-hand, but used a few days only.
10 moulds, $9\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
19 moulds, $9\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
12 moulds, $8\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 inch partitions.

The Wellington
Machine Co.,
WELLINGTON,
OHIO.

Send
for
Circular.

A Good Thing Like the Truth Cannot be Suppressed.



Cunningham's Automatic Rotating Side Cut Brick Cutter.

We guarantee to do as good work and as much of it with **Cunningham's Side-Cut Automatic Brick Table** as can be done with any cutter on the market.

Investigate our **Improved Automatic Cutters** before purchasing elsewhere.

The Wallace Manufacturing Co.,

CHICAGO AGENTS,
Chicago Brick Machinery Co.,
225 Dearborn Street, CHICAGO, ILL.

Frankfort,
Indiana.

See Back Inside Cover Page.

Conveying, Elevating and... Power-Transmitting Machinery.

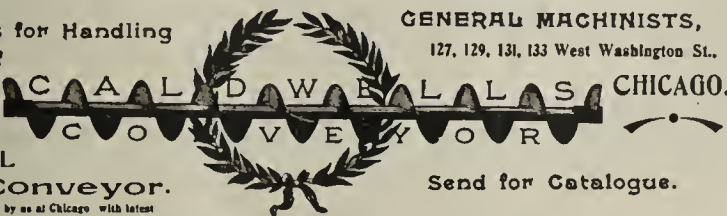
H. W. CALDWELL & SON CO.

Specialties for Handling
Material of
all Kinds.

GENERAL MACHINISTS,
127, 129, 131, 133 West Washington St.,
CHICAGO.

**CALDWELL
Steel Conveyor.**

Manufactured exclusively by us at Chicago with latest
improvements



Send for Catalogue.



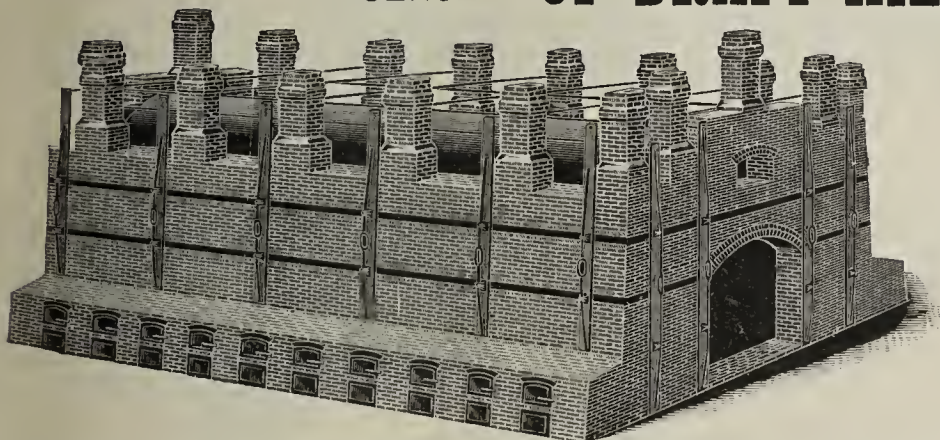
CALDWELL-AVERY SEAM-
LESS STEEL ELEV-
ATOR BUCKETS.

LINK BELTING.
SPROCKET WHEELS.
COTTON BELTING.
RUBBER BELTING.
LEATHER BELTING.
BELT CLAMPS.
ELEVATOR BOLTS.
ELEVATOR BUCKETS.
CONCRETE MIXERS.
FRICTION CLUTCHES.
JAW CLUTCHES.
COUPLINGS.
FLEXIBLE SPOUTS.

GEARINO (all kinds.)
ELEVATOR BOOTS
HANDERS.
PERFORATED METALS.
PILLOW BLOCKS.
IRON PULLEYS.
WOOD PULLEYS.
SHAFTING.
SET COLLARS.
SWIVEL SPOUTS.
TAKE-UP BOXES.
TURN HEAD SPOUTS.
WIRE CLOTH.



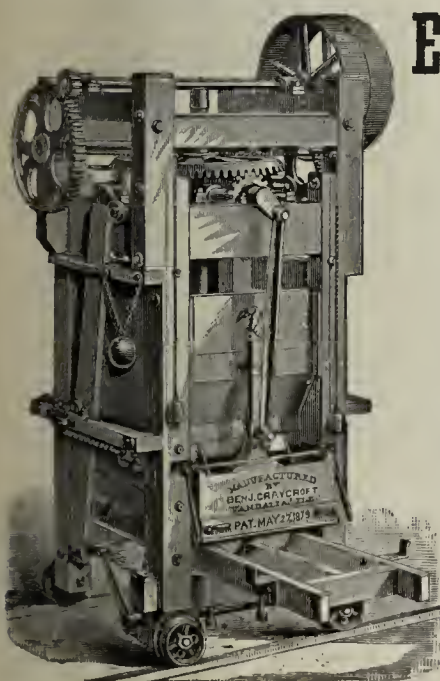
THE THAI SON LATEST IMPROVED COMMON SENSE UP-DRAFT KILN.



Do you make brick? And have you any trouble in burning them? If so, do you want a cheap constructed, simple and durable Kiln? One that will dry any brick without the assistance of Dryer or Fans, and in one-half the time. A Kiln where heat and draft can be changed to any part at will, and burn all hard brick, even and alike throughout, in less time, and with less fuel than any other, no up or down draft Kiln of any kind excepted. This is the Ideal Kiln for Dry Pressed Brick and the best on earth. Sure success with this Kiln. Call and see it at my works or for further information address,

Brick Manufacturer.

A. THAI SON, Laredo, Texas.



EAGLE BRICK MACHINE.

Steam and Horsepower.

THE BEST MACHINE IN THE MARKET.

The Horsepower Machine will make 17,000 to 20,000 brick per day; the Steam power Machine, 25,000 to 30,000.

These machines are sold on their merits, guaranteed to do first-class work.

Brick moulds for hand and machine a specialty. Send for Circular

BENJ. CRAYCROFT,

Manufacturer,

Vandalia, Ills.

C. J. CRAYCROFT, Fresno City, Cal., General
Agent for Pacific Coast.

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cent a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE—Simpson Brick Press; good order. Address H.,
21 tf Care of Clay-Worker.

FOR SALE—Second-hand Monarch machine, A1 condition, used three seasons, \$200. Address "A,"
31 d Care Clay-Worker.

FOR SALE—Two complete overgeared 8-foot dry pans, with 48-inch pulley, entirely new. For particulars inquire of
SMITH & CAFFREY,
34 dm Syracuse, N. Y.

NO DRY PRESS Brick Plant complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 t f d Wellsburg, W. Va.

FOR SALE—One 8-foot Frost grinding pan; one 80-horse-power engine, first-class condition. Address
THE HAYNES COAL CO.,
31 dm Streator, Ill.

WANTED—A good second-hand pug mill, stiff clay brick machine and side cut-off table. Must be in good condition and cheap. Address C. A. R.,
31 d Care Clay-Worker.

FOR SALE—Penfield upright stock brick machine, with independently geared pug mill. Made only 3,000,000 brick. Machine as good as new. Address C. F.,
32 d Care of Clay-Worker.

WANTED—Situation as burner or foreman, up or down-draft kilns, fire brick, shale or clay and roofing tile; 29 years' experience. Good reference.
31 c T. F., care of Clay-Worker.

FOR SALE—A 30 years' old, well equipped Brick Plant, horse and steam power machines, Pallet system, gas or coal fuel. Reason for sale, failure of eyesight and old age. Write to
ANDREW STOLZ,
23 cm Meadville or Kerttown, Pa.

FOR SALE, CHEAP—Stiff mud brick plant, 10 acres, auger machine, disintegrator, boiler and engine, 50-horsepower, practically new; 2 tempering wheels. Cheap.
31 c AYRES BROS.,
Toms River, N. J.

CORRESPONDENCE invited with party desiring to invest in a new brick plant; excellent shale, market, and cheap fuel, advantages surpassing any plant in the State. Address A. Z.,
311 p Care Clay-Worker.

FOR SALE—All or half interest in well-equipped foundry and machine plant, in a mining and clayworking city of 18,000 inhabitants. First-class location for manufacture of clayworking machinery. Seven railroads. Doing good business. Address
31 dm PATCH, care Clay-Worker.

FOR SALE, CHEAP—Brick and tile factory, in Indianola, Warren county, Iowa, or brick machinery, boiler and engine will be sold separately. Present owners cannot handle it. Correspondence solicited.
22 d BERGER,
Care of Clay-Worker.

FOR SALE—A real bargain—a 6-kiln brick plant, everything complete, 40 acres clay, 3 veins, including a very fine vein of Bolivar, which makes a first-class furnace brick; cheap coal. Best reasons for selling. Address
THE FURNACE FIRE CLAY CO.,
31 d Salineville, O.

SALESMAN—POSITION WANTED—As salesman of fire brick, sewer pipe or building and paving brick; have a thorough knowledge of the manufacture of these goods and requirements of the trade; could take office work or assist in management, as desired. Address SALESMAN,
31 d Care Clay-Worker.

WANTED—Situation—Superintendent or Manager, by practical fire, paving or building brick manufacturer; sixteen years' experience; mine to market; thorough knowledge of all grades of clays and development of same. Best of reference. Address "A,"
31 cm Care Clay-Worker.

WANTED—Little Wonder brick machine (new, improved, 1895), and other tools and trucks (second-hand). Cheap for cash. Address
CHAS. O. OKERSTROM, 2701 8th St., S.,
31 cm Minneapolis, Minn.

WANTED—1 Penfield plunger machine, capacity 30,000 or 35,000 brick per day; 1 Potts disintegrator, No. 2; 2 side dump cars, capacity 1 yard; 1,000 feet of 3/4-inch wire cable; 1,500 feet of 12 or 16-lb. rail. All of the above to be second-hand; must be in good order. Address
"SPOT CASH,"
31 d Care of Clay-Worker.

WANTED—Position as superintendent or foreman by a practical tile and brickmaker; has had fifteen years' experience; understands the making and burning of common and fire brick, drain tile and dry pressed brick; also, the handling of down-draft kilns and all kinds of brick and tile machinery, boilers, engines, etc. Can give the best of references from well-known firm in Illinois. Address
311pm BOX 463, DeKalb, Ill.

WANTED—A practical man to act as Manager and Foreman of a plain brick factory near large city. Must also be thoroughly experienced in brick burning—stiff mud. Comfortable residence and garden provided. Prefer one who has some little capital to invest in stock of the company to insure his best efforts in the company's behalf. Address
F. O. BERTRAND, No. 323 Baronne St.,
31 d New Orleans, La.

WANTED—PARTY OR PARTIES—Fire clay for the manufacture of buff brick or sewer pipe, or all other products made from fire clay; 10-foot vein already opened; 10 miles from Pittsburg; products can be shipped by railroad or river; plenty of shale rock for red brick; 20-inch natural gas line through the property. Will furnish ground for the building of a plant, and also the clay, for an interest in the business. Address H. C. FOREMAN,
32 d Harmarville, Allegheny Co., Pa.

FOR SALE—Brickyard, in good condition; made and sold five and a half million brick last season; situated in a growing and solid city of 35,000 to 40,000 population; fair demand for brick. The yard is situated about one and one-quarter miles from central part of city, containing about forty acres splendid clay for red brick. Object of selling, desire to close out business. Address BARGAIN,
Care Clay-Worker.

P. S.—Railroad connection with all roads entering the city.
31 d

FOR SALE—One Eureka dry press brick machine, in first-rate order, at a bargain; one Straight-line engine, 14 by 14, in excellent condition; one 8-foot Sturtevant blower; eight 7-foot drying fans, good as new; five second-hand horizontal boilers, 50 to 60-horse-power, 5 and 6-foot diameter; one Raymond repress, small size, hand-power; 100 iron bedsteads; one No. 2 Worral drier; one large disintegrator, suitable for clay and tile manufacturers; 3,000 seggars, suitable for china and tile works, all of which will be sold at a bargain. Address
C. SIEDLER, Pres., 92 Liberty St.,
23 dm New York City, N. Y.

FOR SALE—The W. S. Williams Brick Plant, situated one mile from Canton, O., on the Valley Railroad. There are thirty-two (32) acres of land connected with this plant, underlaid with clay and shale for street paving brick, and for quantity, quality, variety and accessibility of clays cannot be duplicated, special attention being called to the buff clay deposits for the manufacture of straw-colored brick and other articles, which is unequalled. Capacity of plant, 25,000 street paving brick per day. This property will be sold cheap and on reasonable terms. R. S. SHIELDS,
Assignee of Wm. S. Williams.
23 dm Canton, O.

FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade, including both dry press and auger machines, also continuous kilns using coal and producer gas, and different patterns of down-draft kilns. First-class references. Address
SUPERINTENDENT,
31 d Care Clay-Worker.

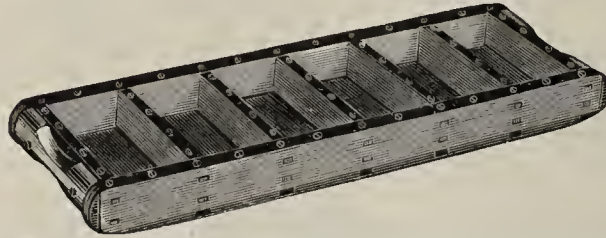
HARDIN, BAILEY & CHURCH.

MANUFACTURERS OF

BRICK MOULDS

Of every kind and description. We make a specialty of Brick moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.
FREEPORT, IND.



Don't fail to get our prices.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

F. H. C. MEY, Chain Belting Engineering Works,

Approved Appliances for
Elevating, Conveying and Transmission of Power,
64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

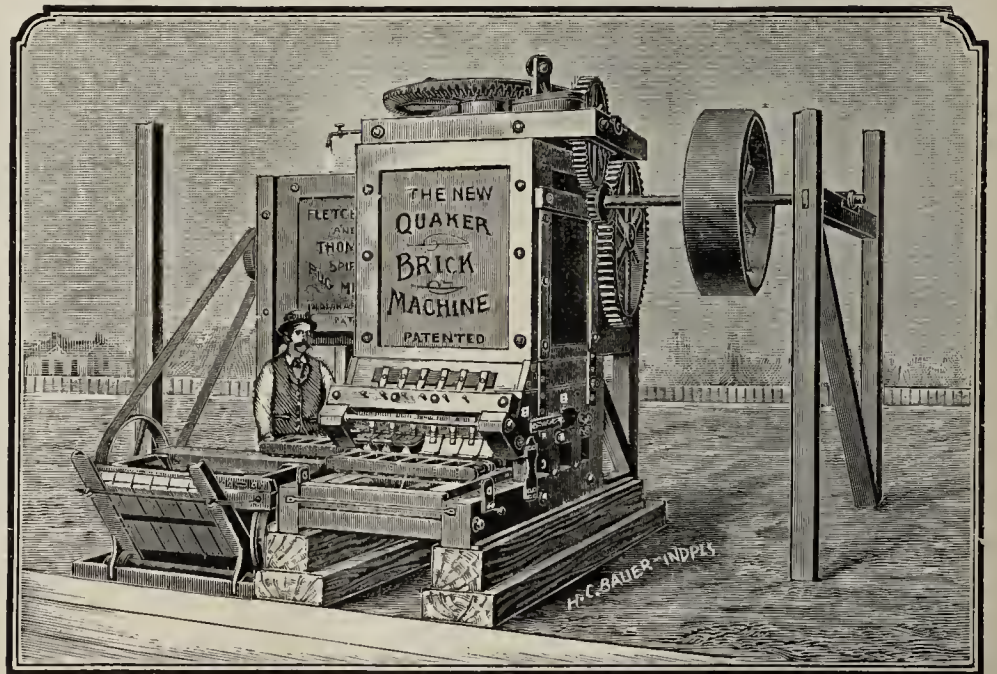
Of the best quality of brick
in a day than he can by the
old method, thereby saving
time and making money.

Send for Catalogue

Soft Mud Brick Machinery.

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sanding Machine, capacity 40,000 or more per day. We carry in stock a full line of first-class brickyard supplies at a very reasonable price. Send for Catalogue.



JAMES W. HENSLEY,
General Agent,

Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

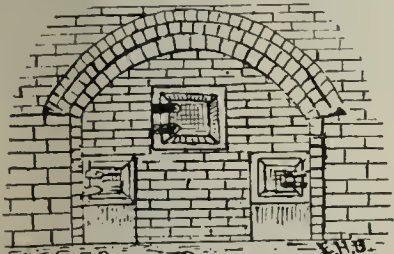
FIRE

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
 44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

Swift's Kiln Furnace,

CAN BE ATTACHED to any kind or style of Up or Down-Draft kiln. Nothing but slack or waste coal used from start to finish of burn. Fires not disturbed but once in 10 hours till watersmoke is off. Guaranteed to watersmoke dry press brick or the tenderest of clays or ware of any kind without damage. These furnaces can be seen in operation at my works at all seasons burning drain tile in winter and brick in summer. It will pay you to investigate—I can save you good money.



F. E. Swift's Patent
Slack Coal Coker, Gas
Generator & Smoke Consumer.
Washington, Iowa.

F. E. SWIFT, Washington, Iowa.

DEAR SIR—In reply to yours of the 25th inst. I will say that I have burned our Eudaly kiln with your furnace attached four times, and have each time saved fifteen tons of coal over the other kilns of the same size containing one hundred thousand brick. In the others I used the best of lump coal and after raising the heat up to the highest point have to use wood in connection with the coal, so as to prevent clinking. With your furnace I use slack entirely, and have no trouble and less work and less smoke. The greatest advantage of all is where I used to have several courses of checked brick in the other kilns, I now have my very best brick. I consider it the very best furnace in existence.

CARL NEIS,
 Supt. of Granite Paving Brick Works,
 Burlington, Ia.

F. E. SWIFT, Washington, Iowa.

DEAR SIR:—Yours of recent date at hand, on inquiry how I like your patent brick kiln furnace, will say, I have burned it 15 heats, and am well pleased with it, and find that I can burn my tile with eight tons of slack coal, as hard as I used to with 10 tons of lump coal in the old common fire boxes, which was, as you know, a plain hole in the wall, with short slanting grate bars. The tile does not crack as in the old kilns. There I had three courses cracked almost every one of them more or less, while in yours, I do not have any except by the door, if I do not get it tight enough. I must change my other kilns before I burn them any more.

I must say your furnaces are a "grand invention" and I need not wish you success, for all you have to do is to get them before the public.

Yours respectfully,
 AUG. H. JOHNSON.

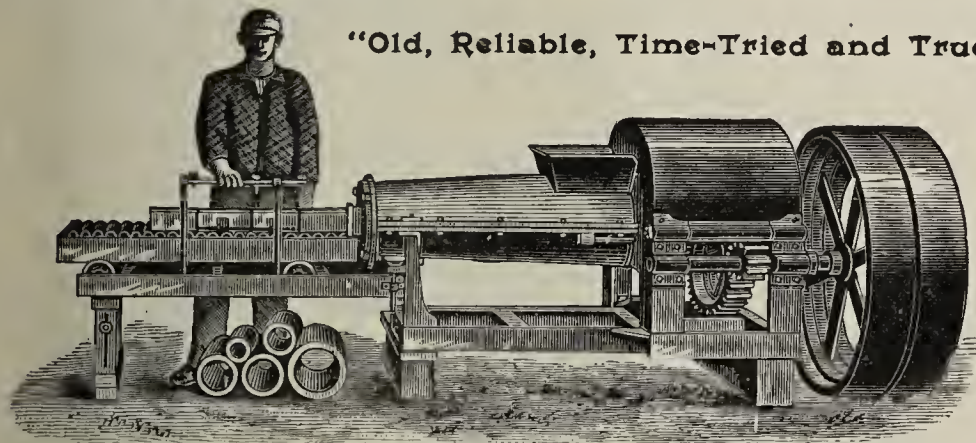
MEDIAPOLIS, IOWA.

For further particulars, address

F. E. SWIFT, Washington, Iowa.

KELLS & SON'S IMPROVED BRICK AND . . . TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON,

PARKHILL, ONTARIO,

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the NEW QUAKER BRICK MACHINE.

WANTED—Prices on 225 green-brick cars, 4,000 feet of light T rail, 2 transfer cars for brickyard purposes.

R. MOULTHROP & SON,
 Eufala, Ala.

13 c

A BARGAIN.

FOR SALE—Brickyard, located at Jacksonville, Ill., one and one-half miles from square; capacity, 2,000 per day; city water; good house; 20 acres; enjoying more city trade than all yards combined; paying business; good reason for selling. Write

J. S. TENDICK, Canton, Ill.

FOR SALE.

Large brickyard property, formerly occupied by the Merhof Brick Manufacturing Company, at Little Ferry, Bergen county, N. J.; 18 machines and all necessary improvements and fixtures to start manufacturing. Can be cut up into three large yards if necessary. Capacity, 30,000,000 brick per year. For further particulars inquire of SAMUEL TAYLOR, Hackensack, N. J., or M. E. CLARENDON, 78 Gold St., New York City, N. Y.

FOR SALE.

1 9-foot dry grinding pan.
 1 8-foot all-iron wet pan.
 1 7-foot all-iron wet pan.
 1 5-foot wet pan.
 1 Potts stock brick machine, with horizontal pug mill.
 1 Potts sanding machine.
 1 Potts disintegrator.
 1 7-foot pug mill.
 2 vertical pug mills.
 1 150-light dynamo, with lamps, etc.
 Lot of steel and iron pallets.

WE MANUFACTURE GRINDING AND MIXING MACHINERY.

THOMAS CARLIN'S SONS,
 Allegheny, Pa.

3 tf d

FIRE BRICK PLANT FOR SALE.

This plant, located at Vandalia, Mo., on the main line of the Chicago & Alton Railroad, midway between Chicago and Kansas City, is offered for sale at the low price of \$20,000.

The plant consists of 5 acres of land, side track, 100-horse-power engine, wet and dry pan, one Raymond auger machine, one Raymond repress, Standard drier and cars, complete; ample drying capacity for special work; 4 down-draft kilns, and everything necessary to begin operations at once. The quality of the goods is second to none, and this is a rare chance for any one to start into business, as the trade is already established. For further particulars address

VANDALIA FIRE BRICK CO.,
 Vandalia, Mo.

31 d

PAVING CONTRACT.

Sealed bids are hereby invited for the paving with vitrified brick and concrete foundation of the following streets:

Texas street, about.....23,725.34 yards
 Common street, from Texas street to Milam street.....1,445.32 yards
 Milam and Texas avenue intersection.....963.1 yards
 Texas avenue.....40,000 yards

Making a total of about.....66,000 yards

Said work to be done according to specifications on file in this office. Said bids to be in the hands of the Controller by 12 m. of Thursday, April 15, 1897. A certified check for \$1,000 to accompany each bid as a guarantee of good faith. The Council reserves the right to reject any and all bids.

N. B. MURFF, Controller.
 City of Shreveport, La.

23 d

Paving and Pressed Brick Plant For Sale.

ONE-THIRD ACTUAL VALUE.

Located in the best of all Western cities. Fine brick buildings, Iron Clad Dryer, Chambers Bros. B. C. D. Brick Machine, Whittaker Dry Press, two Steel Boilers 100 horse power each, Atlas Engine 150 horse power, Pug Mills, two Dry Pans and everything in first-class condition. Reason for selling, have other business. Address

31 d

Care Clay-Worker.

WANTED—Enameler wants position. Can enamel, "not slip and glaze," any bricks made of clay, superior to anything now produced. Will give positive proof of ability at own cost. Only reliable firms treated with. **CLARENDON,**
22 c Care of Clay-Worker.

FOR SALE—Two Simpson presses, one Plymouth brick and tile machine, Plymouth board delivery, brick cutting table, Plymouth tile cutting table, Freese "A Special" brick machine, Stevenson pug mill and Emens granulator. For description of this machinery see page 579, June Clay-Worker, or address **CLEVELAND VITRIFIED PRESSED BRICK CO.,** 809 Cuyahoga Building, Cleveland, O.
7 tf d

FOR SALE—4 second-hand boilers, 40 to 60-horse-power; 1 Chambers machine, 2 pug mills, 12 represses, 18 dump carts, 26 brick trucks, 28 brick wheelbarrows, 20 brick molds. Above goods are all second-hand, and will be sold cheap for cash. Inquire **CHICAGO HYDRAULIC-PRESS BRICK CO.,** Room 301 Chamber of Commerce Building, Chicago.
15 c

**FAST TIME AND THROUGH SERVICE
TO SOUTH BEND.**

Commencing June 22, through parlor cars will be operated between Indianapolis and South Bend daily, except Sunday, on Big Four train No. 3, leaving Indianapolis at 5 p. m., making immediate connection with Vandalia line fast train at Colfax, which passes through Frankfort, Logansport, Lake Maxinkuckee and Plymouth, arriving at South Bend at 10:45 p. m. G. E. ROCKWELL, D. P. A., for details.

**PRESSED BRICK PLANT
FOR SALE.**

This Plant, located at Berlin, Conn., in one of the best brick-making centers in the country, on the main line of the New York, New Haven and Hartford Railroad, one hundred miles from New York, and very convenient to all New England points, will be sold very cheap to settle the estate of the late Edward P. Yale, who was President and principal owner of the Company. It is a splendidly equipped Plant. Buildings and Machinery almost new. The equipment consists of two four-mold Boyd Presses, Engine, Boilers, etc., two patent up and down draught Kilns, capacity of each, 200 M. Splendid Buildings and Sheds, including a fine brick office, and within a stones throw of the Railroad Station.

It may be unnecessary to speak of the Clay, as Berlin brick have a reputation second to none, and there is an unexhaustible supply on the property as well as a splendid Shale Quarry.

This is an exceptional chance for the right man. For further particulars address

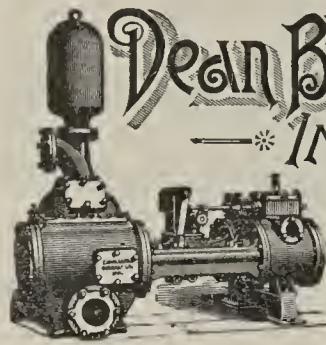
F. H. ALLIS,
New Britain, Conn.

ALBANY SLIP CLAY.

We have a large bank of a superior quality of SLIP CLAY. Price very low by barrel or carload. Best of reference as to quality. Address

JOHN H. JACKSON,
Successor to JACKSON BROS.,
ALBANY, N. Y.

N. Y. State Drain Tile and Pipe Works.
Established 1852.



Dean Bros. Steam Pump Works,
—* INDIANAPOLIS, IND. *

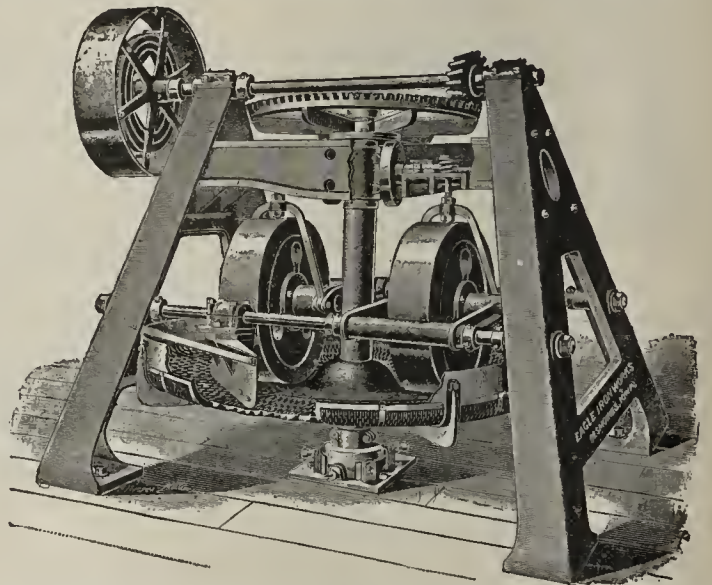
SINGLE & DUPLEX PUMPS.
HORIZONTAL AND VERTICAL PUMPS.
Best Design & Workmanship.
PRICES REDUCED Send for CATALOGUE.

OUR NEW 9 Ft. IRON FRAME DRY PAN

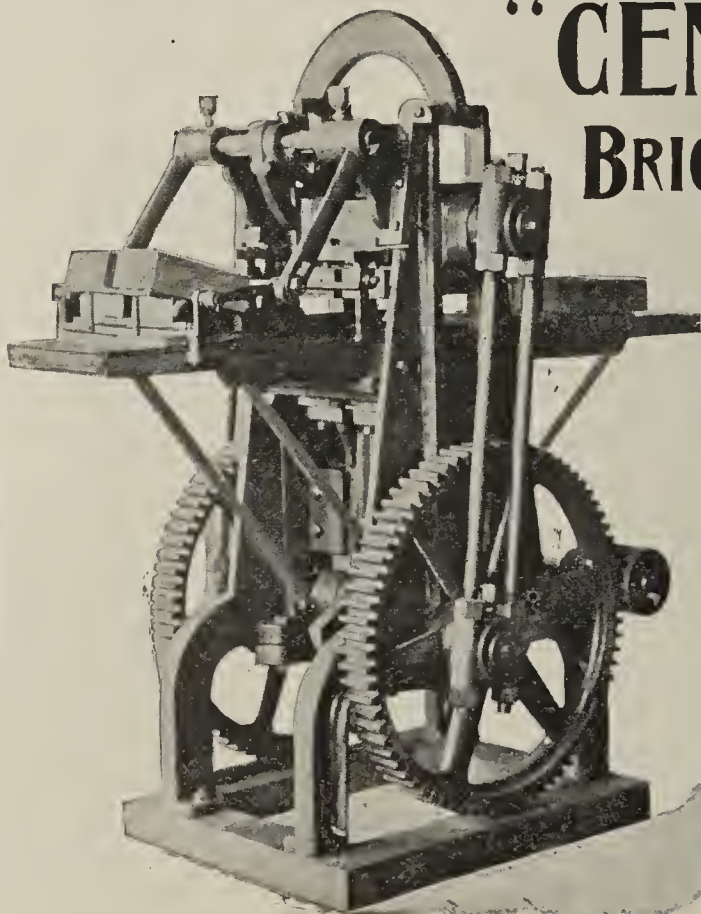
SEND for catalogue and read up on our patented features of this machine. Our motto in its construction and design is

**"NOT HOW CHEAP.
BUT HOW GOOD."**

EAGLE IRON WORKS, Des Moines, Ia.



**"CENTRAL"
BRICK REPRESS.**



This cut shows our double die machine, which is acknowledged to be the simplest and best repress on the market.

It is no experiment, having been in use over two years with best results. Will do same work as others of twice the size and cost.

For particulars address

**Central
Machine
Works,**

236 Abbey Street,
Cleveland, Ohio.

We furnish all supplies and repairs for any make of the "SWORD" Brick machine.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

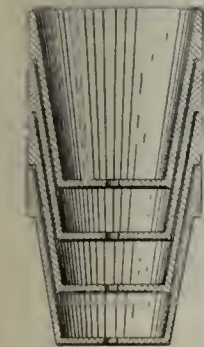
HAND and...
MACHINE

MOULDS

We manufacture the the most substantial Moulds known,
and guarantee every Mould to be first-class
in material and workmanship.

A Special Discount on all orders received
on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

6,000 two-inch Pots;	3,500 five-inch Pots;
4,000 four-inch "	2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

INDIANAPOLIS, IND.



CHAMPION Brick Mould SANDING MACHINES.

This cut represents the latest im-
proved Champion. No belts, apron
or gearing. Simple, strong, and
serviceable.

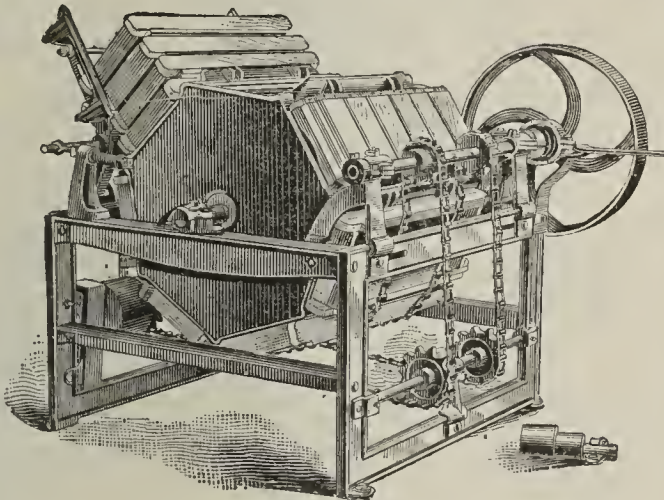
A. H. NEWTON,

Manager and Sole Agent,
HAVERSTRAW, N. Y.

THE case of Newton vs. Buck
was decided March 16th, 1896
by Judge Cox holding that New-
ton was the owner of the patent
301,087 and had the exclusive right
to manufacture machines under
that patent, that Buck infringed
it and should pay Newton dam-
ages and profits and cease manu-
facturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has
reversed the decree, so that the whole matter will have to be re-tried, unless the Court grants a
re-hearing of the case, or permission to go to the Supreme Court of the United States, a motion
for which is pending and will be heard January 25th, 1897.

Only one patent No. 301,087 is involved in this decision and even if it stand, it only gives
Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455;
372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding ma-
chine can be made by Buck without infringing three or more of them. Suit will be commenced
at once on these patents against Buck and any persons purchasing from him or his agents.



4000 TO 5500

(Gallons of Water per hour.)

BY HAND-POWER.

Pumps, Hand-power Pumps.

(LOUD'S PATENT.)

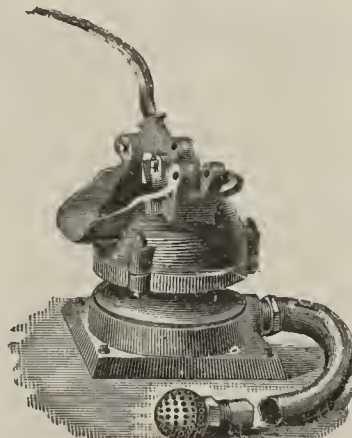
These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works,
Sewer Contractors, Foundation Builders, Miners, Quarries or where-
ever it is desired to raise a large quantity of water by Hand-power. The pump has large
valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage
matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



A. F. TENNILLE'S

Bureau of

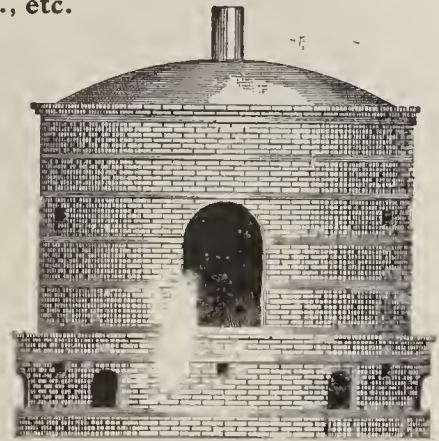
News and Legislative Information,

Congressional, Financial and Commercial.
Tariff, Silver Question and Copyrights a spec-
ialty. Information and Correspondence fur-
nished in all languages.

BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.

AN IMPROVED MUFFLED KILN

For Burning Terra Cotta, Fine Front
Brick, Enameled Brick, Encaustic Tile,
etc., etc.



WE have had many years' experience in
building terra cotta, brick and tile
kilns of different kinds, and can guarantee
successful and satisfactory results, being
practical kiln builders. Our terms are rea-
sonable. Write for particulars, stating
character and capacity of kilns desired.

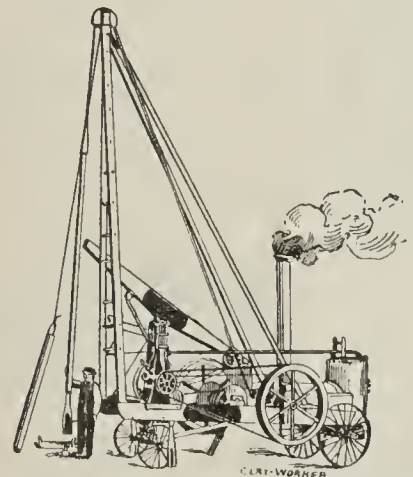
F. HUNDT & CO.,

801 Dudley St., Chicago, Ill.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps speci-
ally adapted for keeping clay pits
clear of water.

Eastern agent for the famous Star Drilling
Machinery. Machines capable of drilling
wells from 150 to 2,500 feet, any diameter de-
sired. Practical men furnished for work of
this class. All machinery handled by me
guaranteed first-class.
Tanks of any size from 100 to 100,000 gallons
capacity.

152 State Street,
PERTH AMBOY, N. J.

THE IMPROVED Interlocking Brick,

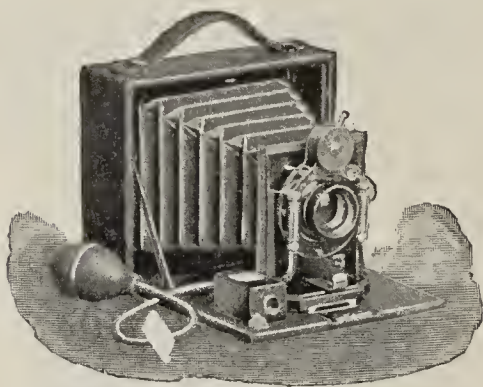
For Hollow Walls and Ventilating.

Send for pamphlet.

G. S. BALSLEY, 490 Howard Street, Detroit, Mich.

Do You Enjoy Pictures?

And do you know you can make excellent Photographs yourself with a



Premo Camera

Light and compact, easily carried and manipulated. The Premo is the most popular Hand Camera in the market.

ROCHESTER OPTICAL CO.,
ROCHESTER, N. Y.

Steubenville Foundry & Machine Works,

Established in 1820.

—Manufacturers of—

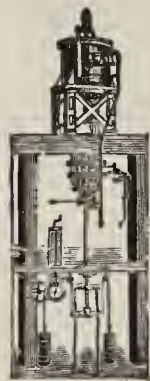
STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,

Making From 2 to 30-Inch
Pipe Inclusive.

Pipe, Brick, Tile, Coping,
Fire Proofing, and
Building Block Dies.

Clay Grinding and Tempering
Pans and Pug Mills.



FEED
SCREWS
FOR
MINING
CLAY.



STEAM
—ENGINES
—AND—

Every Variety of Iron and Brass Castings
Shafting and Pulleys.

Send for Circulars and Estimates.

JAS. MEANS & CO.,
Steubenville, Ohio.

NEW DISCOVERY KILN

Patented April 13, 1886, June
1888 Nov. 7 1891.

More Than **1,000** Now Stand as
Monuments of Fame to its Inventor

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

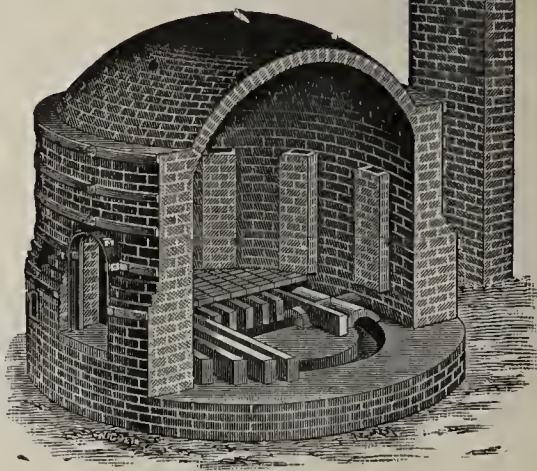
Reward For Information of Infringements.

To know more and what they say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
Marietta, Pa.

Chenoa, Ill.



Elevators

For handling
CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.

Also Furnish
RUBBER,
LEATHER,
COTTON
BELTING.



JEFFREY

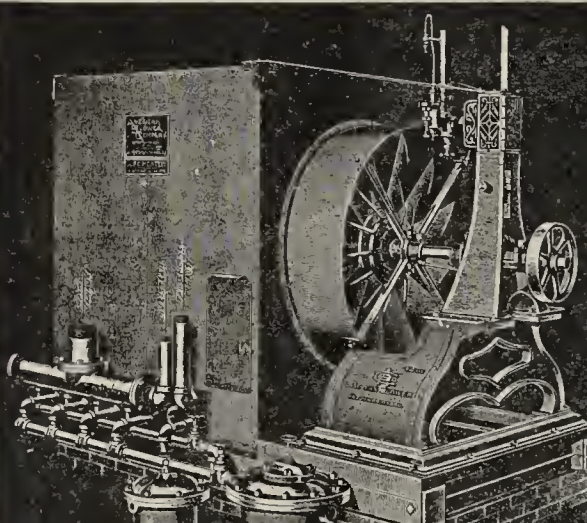
Roller, Steel and Special CHAINS
—FOR—
**ELEVATING
CONVEYING
MACHINERY**
FOR HANDLING MATERIAL OF ALL KINDS.
Power Transmission Machinery.
COAL MINING MACHINERY.

WIRE CABLE
CONVEYORS.
For long and
short distance
conveying.

THE JEFFREY MFG. CO., Columbus, Ohio.
Send for Catalogue. 163 Washington St., NEW YORK.

Conveyors.

Manufacture
SHAFTING,
PULLEYS,
HANGERS,
GEARS,
CLUTCHES,
BUCKETS,
BOOTS,
BOLTS,
Etc. . . .



THE

**HOT BLAST
APPARATUS**

**FOR
DRYING
BRICK
TILE AND
TERRA COTTA**

American Blower Co
SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

SEND FOR CATALOGUE

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years. Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

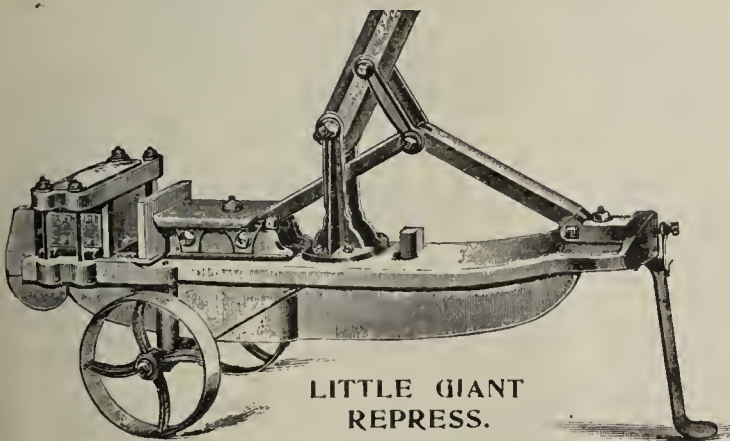
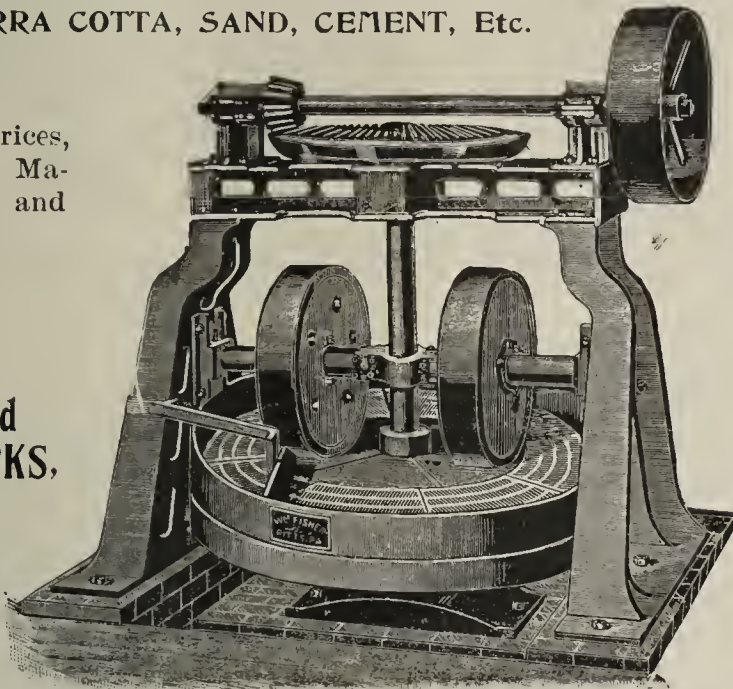
••••

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

••••

**FISHER ENGINE
FOUNDRY and
MACHINE WORKS,**

Phillips & McLaren,
Proprietors,
24th and Smallman Sts.,
PITTSBURG, PA.



LITTLE GIANT
REPRESS.

ELI Auger Machine,
Capacity 45,000 to
70,000.

ELI Jr. Auger Machine,
Capacity 30,000 to 40,000.

LITTLE ELI Auger Machine,
Capacity 15,000 to 20,000.

No. 1 A, Auger Machine,
Capacity 25,000 to 35,000.

No. 2 B, Auger Machine,
Capacity 12,000 to 20,000.

THE No. 1 A and No. 2 B Machines furnished with Square Hopper in place of Upright Pug Mill if desired.

DISINTEGRATORS, HORIZONTAL CONVEYORS,

GRANULATORS—SINGLE AND DOUBLE SHAFT,

UP-RIGHT PUG-MILLS, WINDING DRUMS,

BRICK TILE AND HOLLOW BLOCK TABLES.

TRUCKS, WHEELBARROWS, ETC.

Manufactured and fully warranted by

Michigan Brick and Tile Machine Co.,
MORENCI, MICH.

FREE Sample Copy of HOME STUDY

...An Elementary Journal for Students

Of Mechanics, Electricity, Architecture, Mining, Plumbing, Heating and Ventilation, Steam Engineering, Civil Engineering and Mechanical and Architectural Drawing.

HOME STUDY, Box 958.
Scranton, Pa.

GEO. S. COX'S

**Ready Made
Cutting Wires,**
Always give Satisfaction.

EAST LIVERPOOL, OHIO.

Send for Samples and Prices.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN,
H. W. FULLER, Ass't Gen'l Pass. Agent.
Gen'l Pass. Agent, CINCINNATI, OHIO
WASHINGTON, D. C.

M. V. B. WAGONER'S

SLIP CLAY { For Glazing of Pottery } WORKS

ESTABLISHED 1845.

Clay in stock in any quantity, in barrels and bulk by the carload.

Office, 20 Ten Broeck St., ALBANY, N. Y.

STOP-LOOK LISTEN

THE
POPULAR

MONON ROUTE
LOUISVILLE NEW HAVEN CHICAGO RY. CO.

IS THE BEST LINE TO

CHICAGO

TIME
REDUCED TO 4¾ HOURS.
FOUR DAILY TRAINS

Leave Indianapolis	{ 7:00 a. m., 11:50 a. m. 3:35 p. m., 12:55 night
Arrive Chicago	{ 12:00 noon, 6:00 p. m. 8:20 p. m., 7:20 a. m.
Trains	{ 3:30 a. m., 7:45 a. m.
Arrive Indianapolis	{ 2:35 p. m., 4:37 p. m.

LATEST IMPROVED

VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant

PARLOR CARS AND DINERS

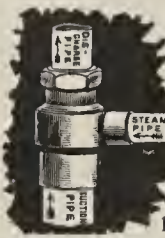
Local Sleeper in Indianapolis Ready at 8:30 p. m.

Leave Chicago, Returning, at 2:45 a. m.

Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: 2 West Washington St.,
Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.



VANDUZEN STEAM PUMP
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
 Always in Order, never Clogs nor
 freezes. Every Pump Guaranteed.
10 SIZES.
 200 to 12000 Gallons per Hour.
 Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
 102 to 108 E. Second St., Cincinnati, O.



Solid Train Between
Sandusky and Peoria
 —AND—
 INDIANAPOLIS and
 MICHIGAN CITY,
 FT. WAYNE and
 CONNERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger..... 7:00 a. m.
 *No. 22 Passenger..... 1:20 p. m.
 No. 24 Passenger..... 7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger..... 10:20 a. m.
 No. 23 Passenger..... 2:50 p. m.
 No. 25 Passenger..... 6:20 p. m.
 *Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on
 A. H. SELLARS, Agent,
 Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.
 INDIANAPOLIS, IND.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD and JACKSONVILLE, ILLINOIS.

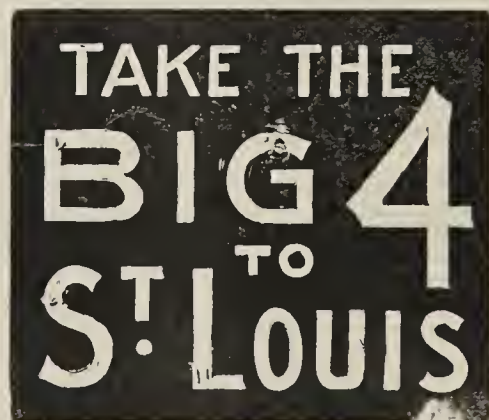
TIME OF TRAINS AT INDIANAPOLIS:
LEAVE.

Mail and Express..... 8.30 a m
 Accommodation..... 3.25 p m
 Fast Express..... 11.20 p m

ARRIVE.

Fast Express..... 3.30 a m
 Accommodation..... 10.40 a m
 Mail and Express..... 4.50 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



LUMBER AND BRICK DRYERS, MOST EXTENSIVE IN USE.

W. A. LEARY,

1103 H Street, N. W.

WASHINGTON, D. C.

Do You Want

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKMAN ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, **ASSOCIATED TRADE & INDUSTRIAL PRESS,**
 ESTABLISHED NINE YEARS. Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

"LEVIATHAN."

"Upon Earth There is not His Like."

MAIN BELTING CO., 248 Randolph St., Chicago, Ill.
 GENTLEMEN:—Please ship us via freight, 146 feet x 18" 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN."
 Prompt shipment of the above will oblige. Yours very truly,

Manufactured under Special Process.
A Guarantee of Superiority.

NOTE.—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum

MAIN BELTING COMPANY,
 Sole Manufacturers LEVIATHAN BELTING,
 248 Randolph St., CHICAGO, ILL.

PHILADELPHIA: 1219 Carpenter Street.

BOSTON: 120 Pearl Street.

THE Best Up-to-Date Brick Dryer.

The PHILLIPS DRYER is THE BEST DRYER because it dries brick Quickly, Safely and Cheaply. By this system there is really no cost for fuel for it saves more fuel than it uses. This may sound queer but it's A PROVEN FACT.

SOMERSET, MASS., August 26, 1893.

S. G. Phillips, Esq., Rahway, N. J.

DEAR SIR—Replying to your inquiry regarding Dryer. We are pleased to say the dryer has now been running five weeks, and so far has given the best of satisfaction, drying our pressed brick for enameling in 10 hours, size of brick (9" x 4 1/2" x 3") without warping or checking.

A vacuum gauge to the exhaust, that heats the dryer, shows our variable cut-off engine to be made condensing, and it is safe and not over-estimated in any point of view to say, the dryer is so far working all right, and costing us no extra power, or firing, as we also do our former work and yet are saving 20 per cent. in our fuel.

We consider the dryer to be doing all if not more than promised, and hope soon to add to our present capacity another two track section.

SOMERSET & JOHNSONBURG MFG. CO.,
 By Warren H. Sanford, Treas.

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.
 MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,
 CHAMBERS BROTHERS CO.,
 J. H. Chambers, Gen'l Mgr.

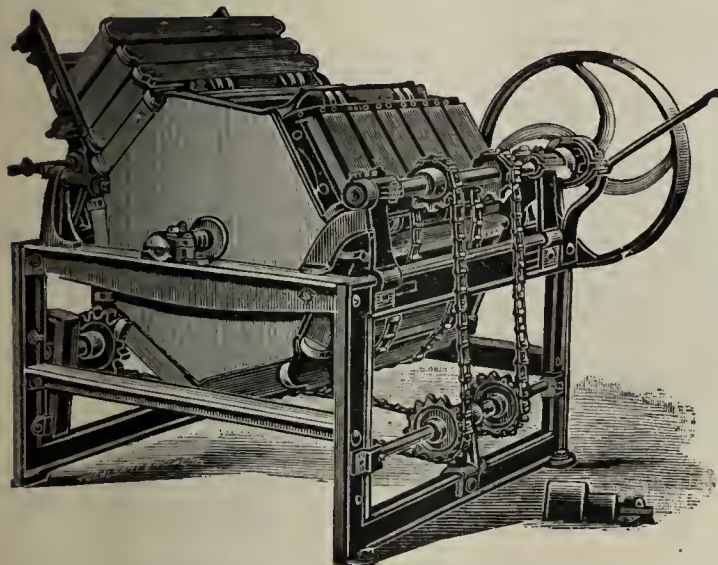
S. G. PHILLIPS.

Agent and Patentee,

161 Grand Street.

— Rahway, N. J.

BUCK'S NEW CHAMPION Brick Mould Sanding Machine.



Judge Wallace's Decision.

[COPY.]

U. S. Circuit Court Southern
District of New York.

ADDIE NEWTON } In
vs. } Equity.
WILLIAM W. RIDER }

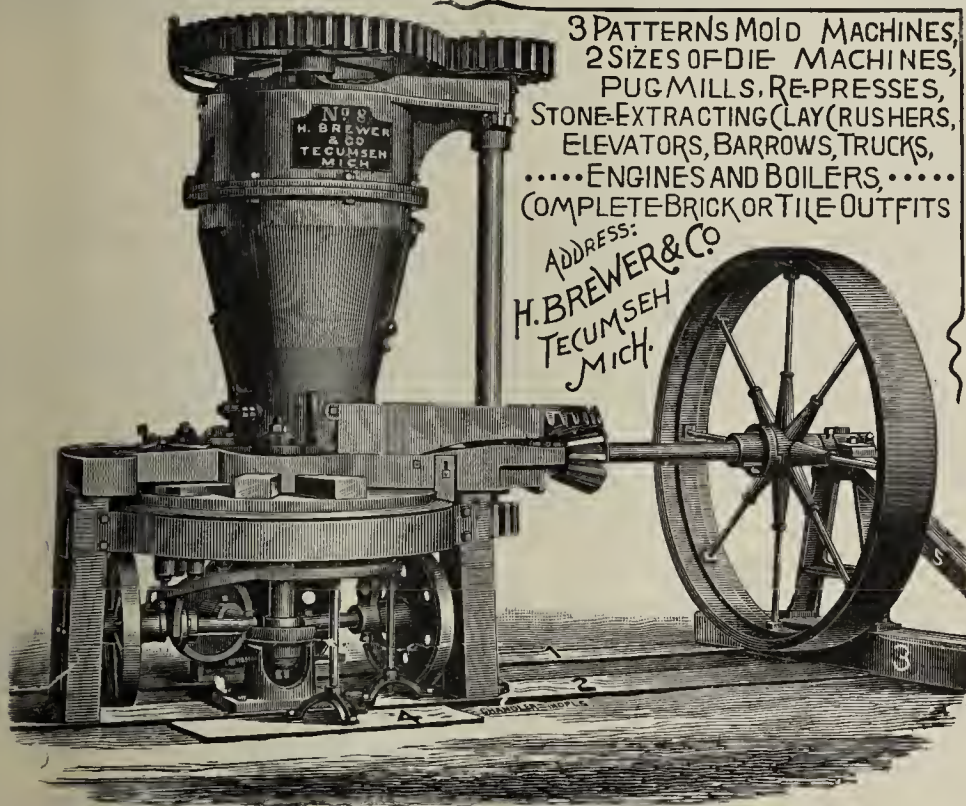
This cause having come on to be heard this sixth day of April, 1895, upon argument of demurer, and Mr. Walter E. Ward having been heard on the part of the plaintiff, and Mr. George A. Mosher on the part of the defendant, and due deliberation having been had, it is. Ordered, adjudged and decreed that demurrer be sustained, and that the plaintiff's bill of complaint be dismissed with costs to the defendant to be taxed.

WM. J. WALLACE,
Circuit Judge.

THIS terminates the suit on patent No. 301,087 which Newton has so extensively advertised. It was defended by J. A. Buck without expense to Rider. Any interest which Newton may have had in this patent has since been sold at receiver's sale, April 30, 1895. The other patents relating to this machine had been previously sold January 21, 1892, at a similar sale. J. A. Buck now owns or controls all patents relating to this machine, and the trade is warned that so-called "Champion" machines made by other parties are infringements upon these patents.

J. A. BUCK, 76 Oneida St., Cohoes, N. Y.

WHITEHEAD BROS. & CO., General Agents, 517 West 15th St., New York City.



3 PATTERNS MOLD MACHINES,
2 SIZES OF DIE MACHINES,
PUG MILLS, RE-PRESSES,
STONE-EXTRACTING (CLAY) RUSHERS,
ELEVATORS, BARROWS, TRUCKS,
..... ENGINES AND BOILERS,
COMPLETE BRICK OR TILE OUTFITS

ADDRESS:
H. BREWER & CO
TECUMSEH
MICH.

VANDALIA LINE The Short Line for St. LOUIS AND THE WEST.

LEAVE	AR. TERRE	AR. ST.
INDIANAPOLIS,	HAUTE	LOUIS.
* 7:20 am	10:05 am	.....
* 8:15 am	10:19 am	3:55 pm
* 12:40 noon	2:44 pm	7:32 pm
* 7:00 pm	9:04 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am
* Daily.		

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Tickets Offices, 48 West Washington St., 46 Jackson Place and Union Station.

GEO. E. ROCKWELL, Dis. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS

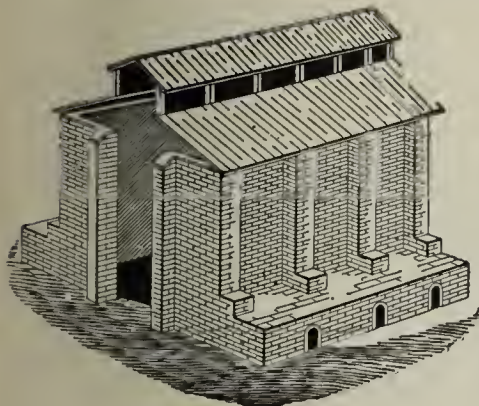
MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns **WANTING INDUSTRIES**

This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.



Up-Draft Kiln.

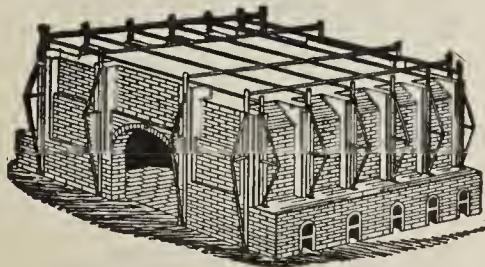
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET. The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiln.



BRICK CARS.

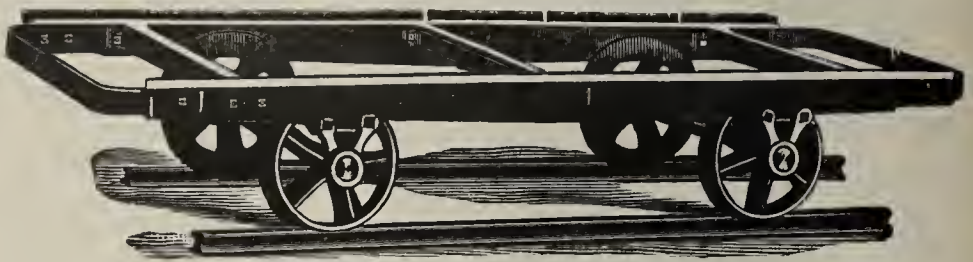
THE BEST. NO EXPERIMENT.

Thirty styles of our cars in use in all parts of the United States and Canada. Nearly 2000 of our cars are in use in Cleveland alone by the following Brickmakers:

F. H. Eggers,
C. G. Barkwell,
Standard Brick Co.,
Peter Cullen,
Collinwood Brick Co.,
Cleveland Brick Co.,
Canadian Copper Co.,
George Gynn,
Warren Farr,
John Cullen.

Write Them,
Then Us.

Catalogue and Price List sent on application.



Style 28.

WALWORTH RUN FOUNDRY CO., Cleveland, O.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

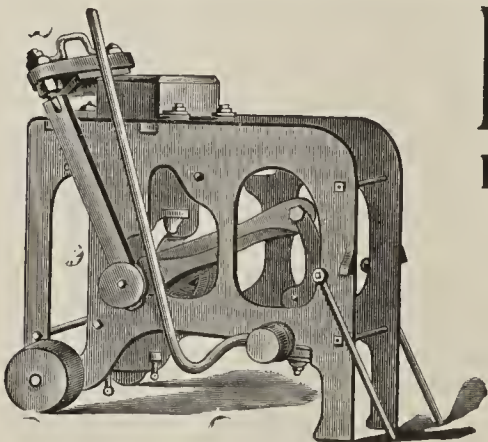
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,

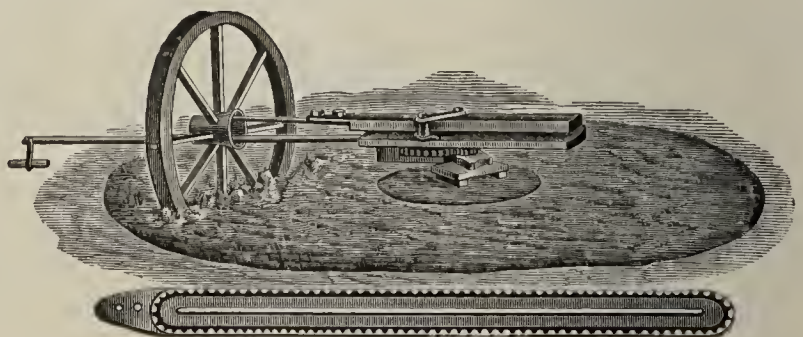
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

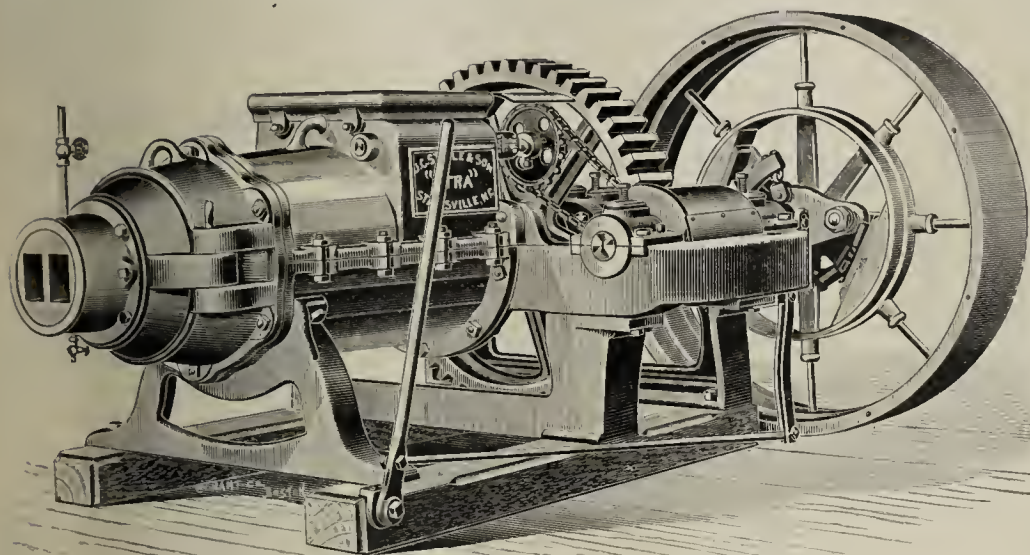
Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



Send for Circular and Price-List.

These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

The New South Brick Machinery



X-tra Machine. Capacity 25,000.

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.

DANVILLE, VA., Sept. 22, 1896.

J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Answering your query as to how we are pleased with the outfit furnished us by you of brickmaking machinery and implements, we would say that it has given us good satisfaction. The brick machine does all that you claimed for it. The trucks are great labor saving implements and the winding drum and cars equally so. In our system we could hardly dispense with either the trucks or cars and drums.

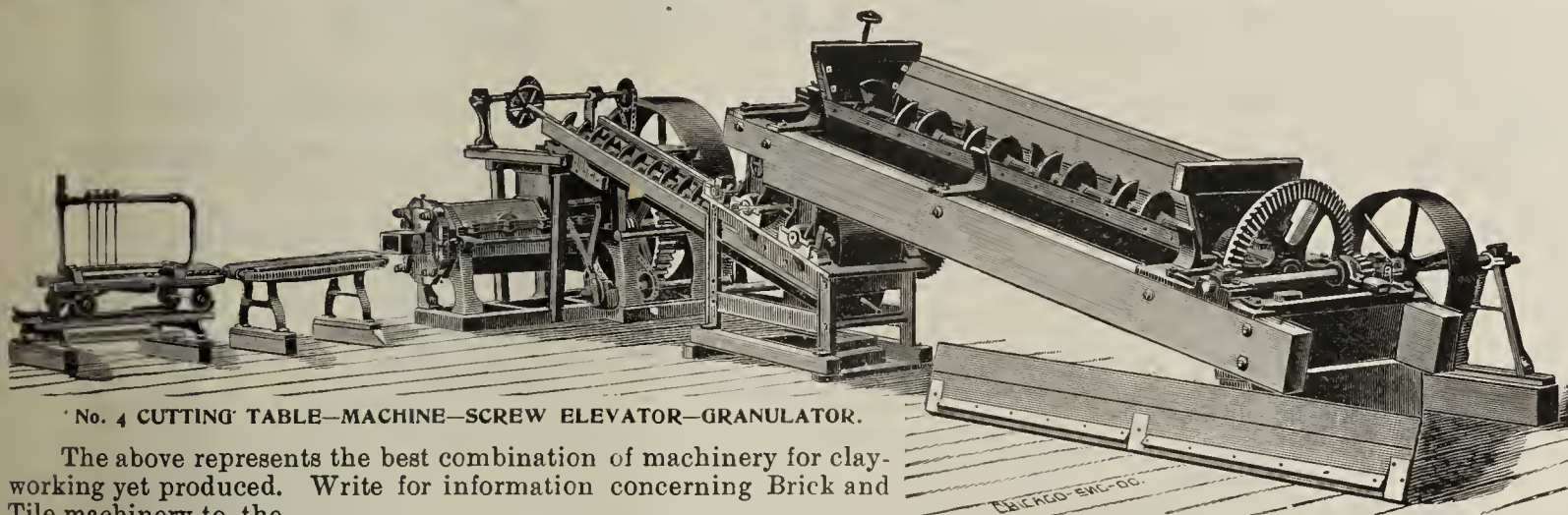
Respectfully,
DON VALLEY BRICK CO.

(This company is using the "X-tra" machine and make 30,000 brick per day.

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

ADRIAN BRICK AND TILE MACHINE CO.



No. 4 CUTTING TABLE—MACHINE—SCREW ELEVATOR—GRANULATOR.

The above represents the best combination of machinery for clay-working yet produced. Write for information concerning Brick and Tile machinery to the

ADRIAN BRICK AND TILE MACHINE CO., Adrian, Michigan.

STEDMAN'S IMPROVED CLAY DISINTEGRATOR

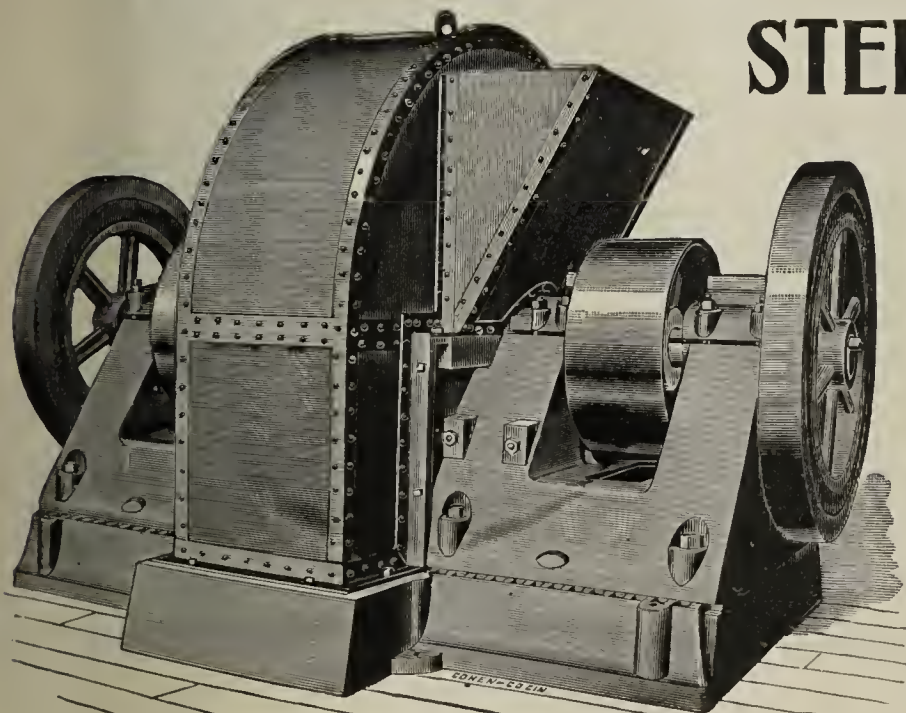
For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

Aurora, Ind.



ROPKEY-MASON ENGRAVING CO.,

Make the finest engravings of any and every kind—Wood Cuts, Photo-Engravings and Etchings. We make a specialty of Clayworking Machinery, and will be glad to quote you prices. Send for Samples.

INDIANAPOLIS, IND.

ALSIP'S LATEST IMPROVED DOWN and UP-DRAFT KILN.

IS SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

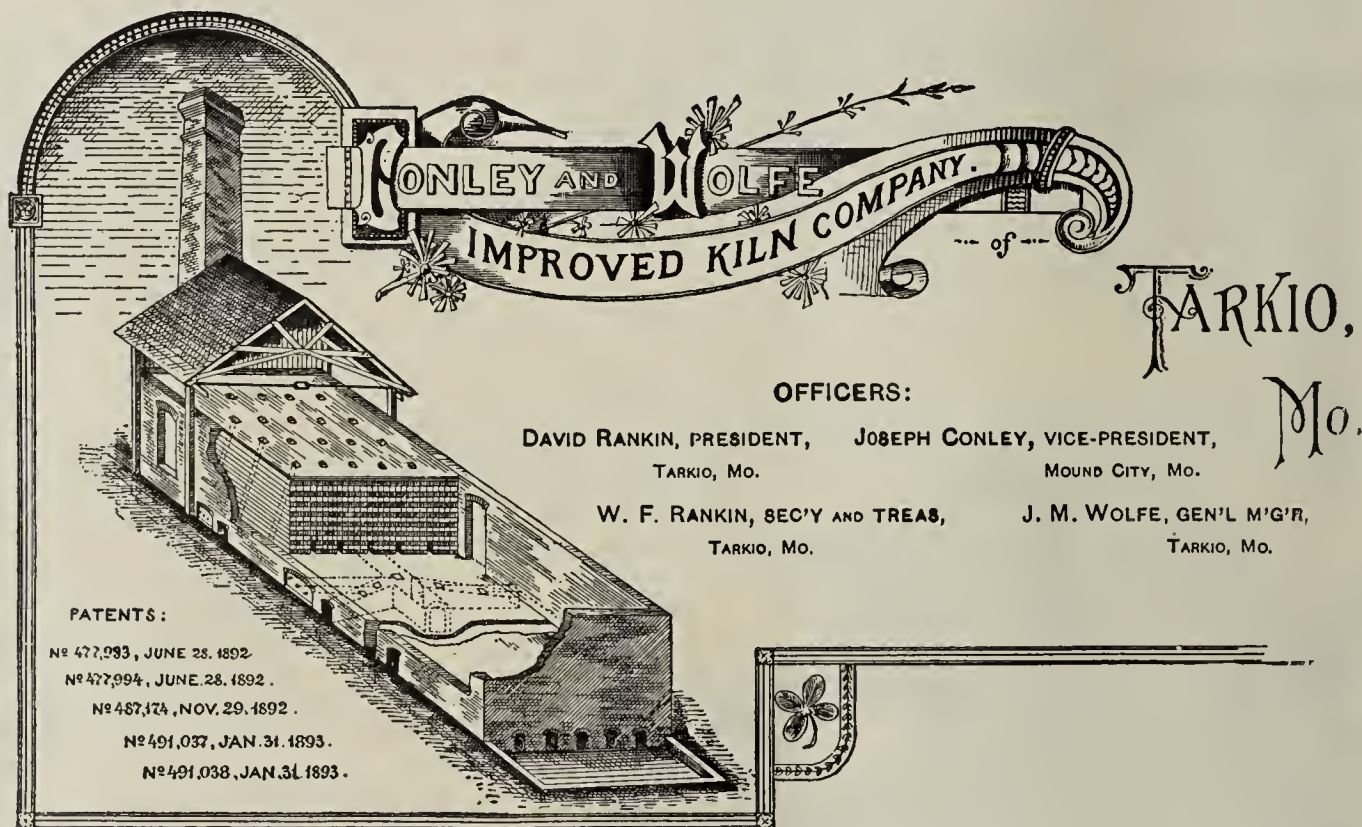
If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

Address, **S. H. ALSIP,**

Days Brick Yard.

BELLEVILLE, ILL.



THIS KILN is cheap to construct, simple in operation and permanent in character. It has no crown to fall in and costs nothing for repairs. The dampers in the bottom give complete control of the heat and draft. It burns all brick evenly and thoroughly. It heats the brick gradually and cools the same, producing a tough and thoroughly annealed brick. It requires less than 200 lbs. slack coal per thousand to burn the very best annealed vitrified shale paving brick. It saves labor—one man can fire the largest kiln.

The Slack is converted into Gas and all the Heat Energy in the Coal is Utilized.

IT IS A SMOKE CONSUMER
AND A PROFIT PRODUCER.

✦ YOU NEED THIS KILN. ✦

WRITE OUR GENERAL MANAGER
FOR FULL INFORMATION.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

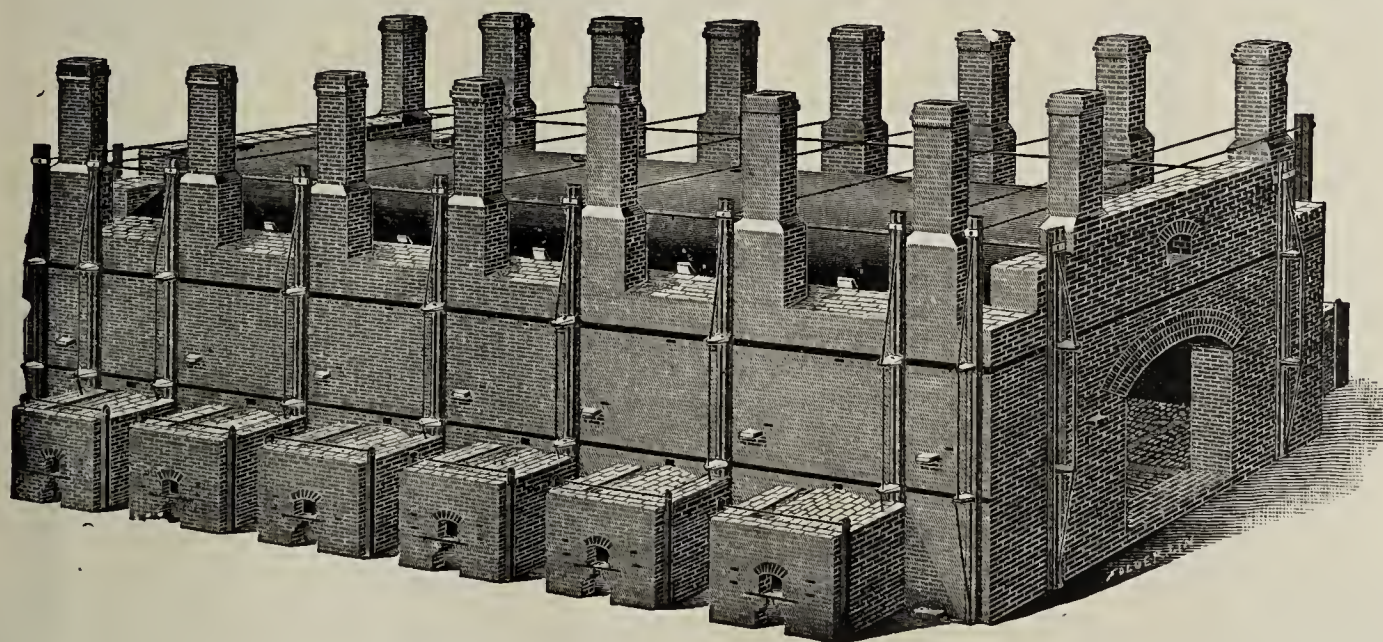
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



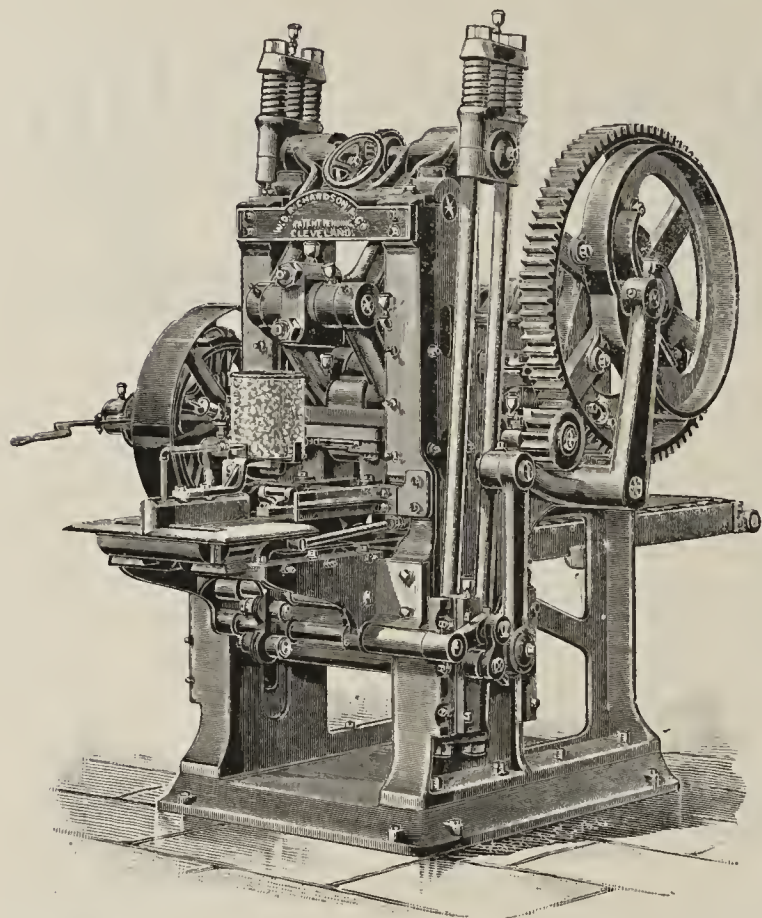
A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

Coming to the Front,



The RICHARDSON REPRESS.

• • • •

We have received lately orders for the Repress from three well-known brick companies—one order being for the second machine.

Two of the companies have been using Represses for years, and know a good thing when they see it.

We make brick presses for every requirement, and molds and dies for ornamentals and special shapes.

We make many other things that you ought to know about.

Write for information.

• • • •

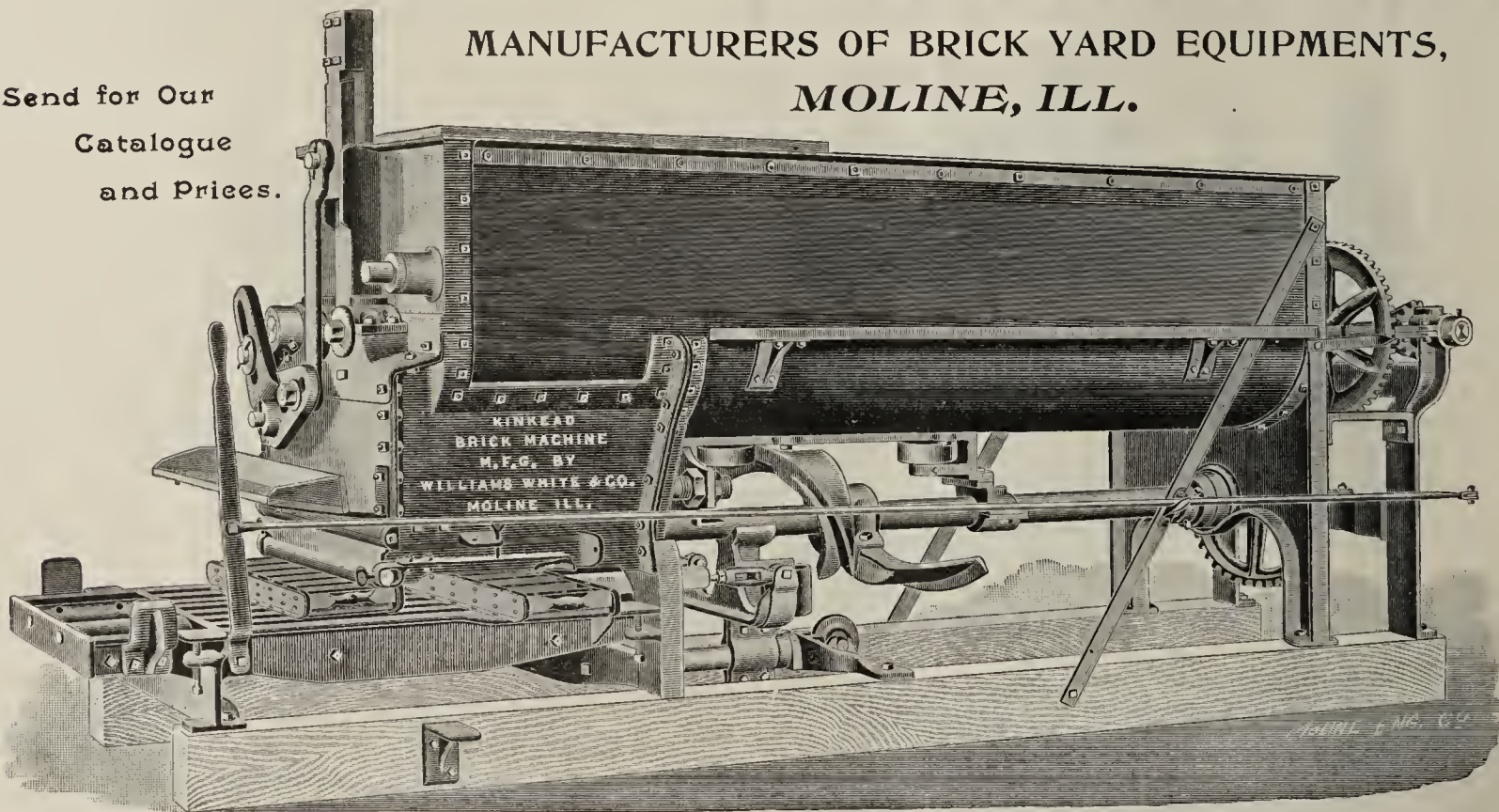
The Ohio Ceramic Engineering Co.,

59-63 Center St., CLEVELAND, OHIO:

WILLIAMS, WHITE & CO.

MANUFACTURERS OF BRICK YARD EQUIPMENTS,
MOLINE, ILL.

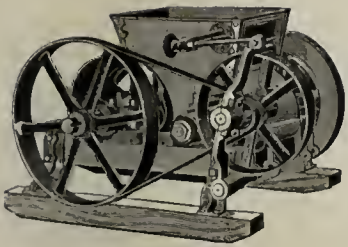
Send for Our
Catalogue
and Prices.



The **KINKEAD MACHINE** takes the clay direct from the bank, preparing it more thoroughly than any pug mill or machine on the market. It fills the mold full and sharp every time. It is simple in construction, easy to take care of, and durable.

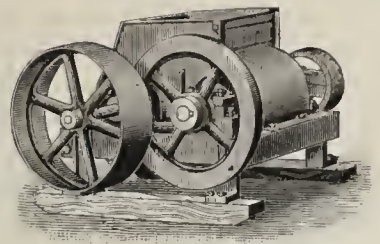
We solicit correspondence also on complete outfits for brickyards—molds, trucks, barrows, cars of all kinds, elevators, sanders, disintegrators, etc., etc. Get our Mold circular and prices.

(Mention the CLAY-WORKER.)



T

The Potts Disintegrators



(PATENTED.)

Will work any clay direct from the bank. Will not choke or clog from hard, dry or wet sticky lumps of clay. Does not pack the clay into thin hard sheets, but leaves it in the best possible condition for pugging. Will separate the large stone and grinds the small ones.

The most successful machine of the kind ever offered the trade. They are well built, strong and durable.

Manufactured only by

C. & A. POTTS & CO.,

420-428 West Washington St., (Old National Road,)

INDIANAPOLIS, IND.

No. 146. TURNABLE.

No. 150. STEEL BOTTOM DUMP.

No. 170. STEEL SIDE DUMP.

No. 201. OAK SIDE DUMP.

THE ATLAS BOLT & SCREW CO.,
CLEVELAND, O., U.S.A.

MANUFACTURERS OF

STEEL BRICK DRYER CARS,

SMALL CARS OF ALL KINDS,

STEEL DRY KILN, LUMBER TRUCKS,

STRONG, LIGHT AND EASY RUNNING.

FULL LINE STEEL WHEELBARROWS.

No. 142. TRANSFER CAR.

No. 105. SOFT MUD FLAT.

No. 124. DOUBLE DECK.

No. 103. STIFF MUD FLAT.

No. 126. D.D. STEEL DECK.

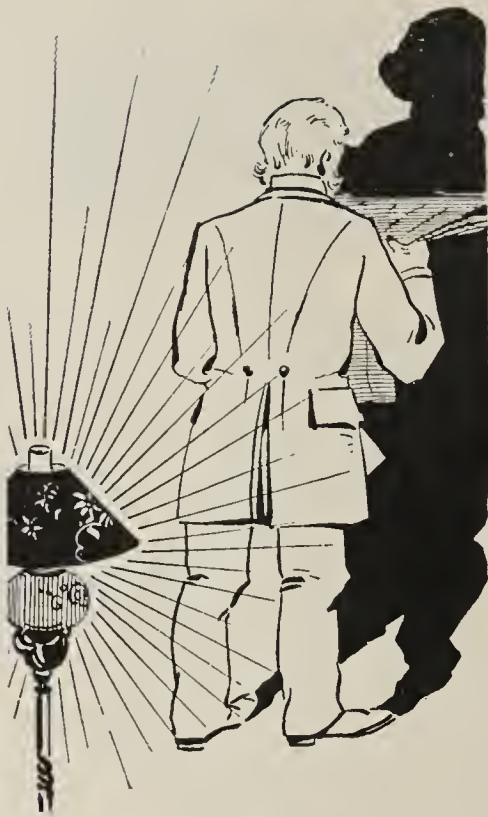
No. 108. FLAT, STEEL DECK.

No. 136. 3 SECTION RACK.

No. 133. SOFT MUD RACK.

No. 140. BOX SHOCKS, Etc.

No. 139. SHINGLES, STAVES, Etc.



Don't Stand in Your Own Light

When it comes to buying machinery. Give the light a chance and it will show you something.

A good machine, well built, will be a bright light in your brickyard, not only for this season, but for years to come. And it will show you the pathway that leads from the Rocky Road of Hard Times back to the smooth ways of prosperity.

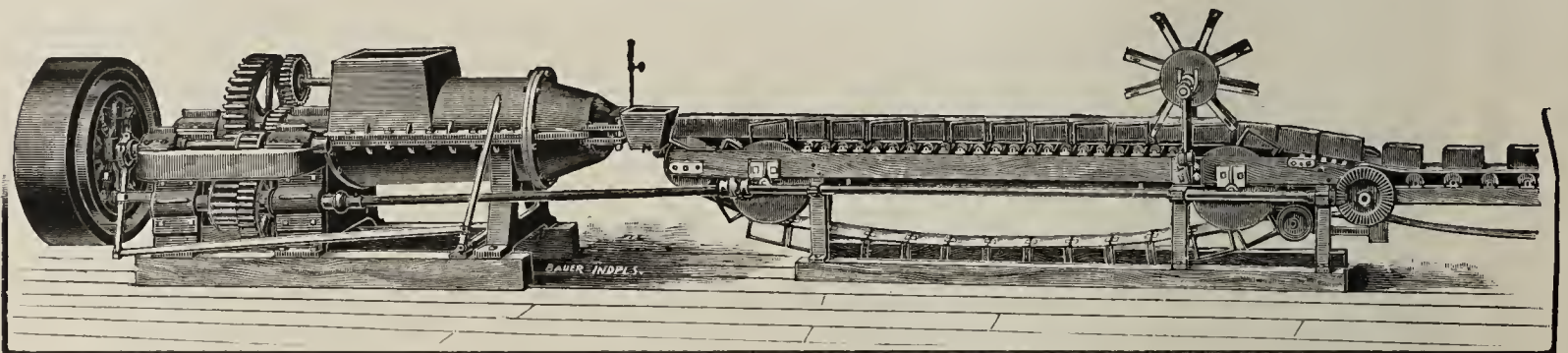
We have these good machines, well built, and can furnish them to you at low prices:—either soft mud, stiff mud, or dry press—but each the best of its kind and the best built.

Don't Stand in Your Own Light by getting a poor machine!

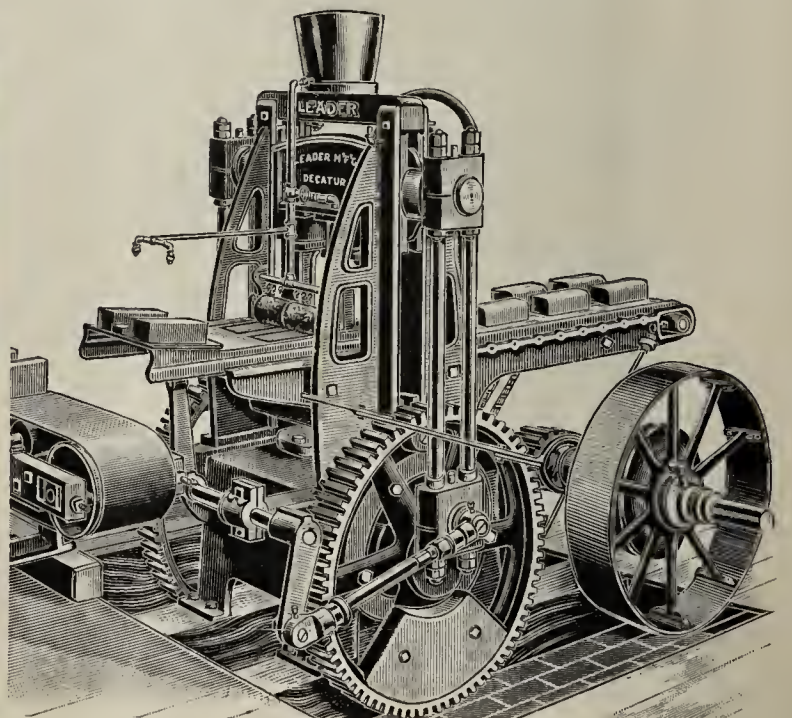
We also offer some fine bargains in second-hand Dry Presses, and in other kinds of second-hand machinery. Write us for anything you want in that line, as our list is constantly changing.

Has any brickmaker a Repress in good condition, for sale cheap? Quote us any machinery you want to sell that is in good shape.

The Chicago Brick Machinery Co., 225 Dearborn Street.



LEADER
MANUFACTURING Co
 DECATUR ILL.
 MANUFACTURERS OF
 BRICK MACHINES, BRICK PRESSES,
 PUG-MILLS, CRUSHERS
 DISINTEGRATORS, AUTOMATIC CUTTERS,
 + ELEVATORS +
 AND
 COMPLETE OUTFITS.
 SEND FOR PRINTED MATTER.

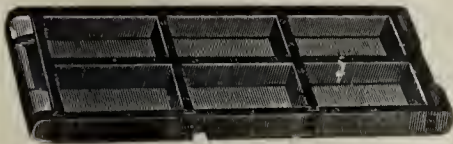


ARNOLD'S

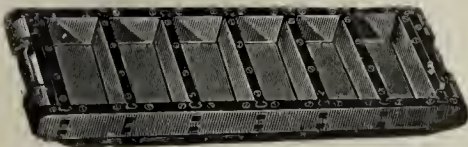
BRICKYARD SUPPLIES,
Are the Standard.



3 Brick Hand Mold.



6 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

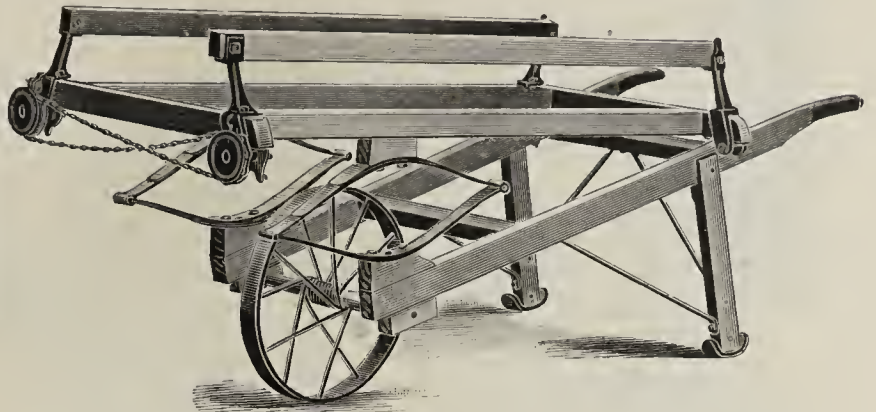
We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

Send for catalogue and price list. Address,
D. J. C. ARNOLD, New London, Ohio.

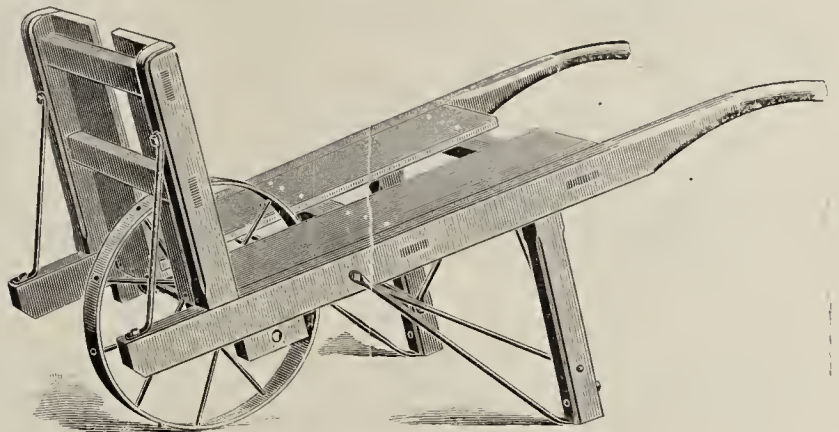
TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market.

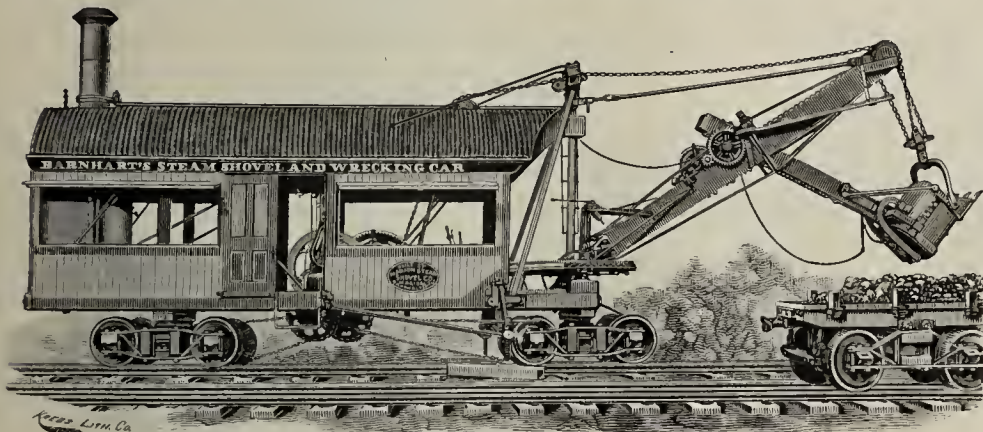
BARROWS, For Various Purposes.

Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind.



No. 4 Brick Barrow.

Steam Shovels for Brickyards.



STYLE A-1 1/2 YD.

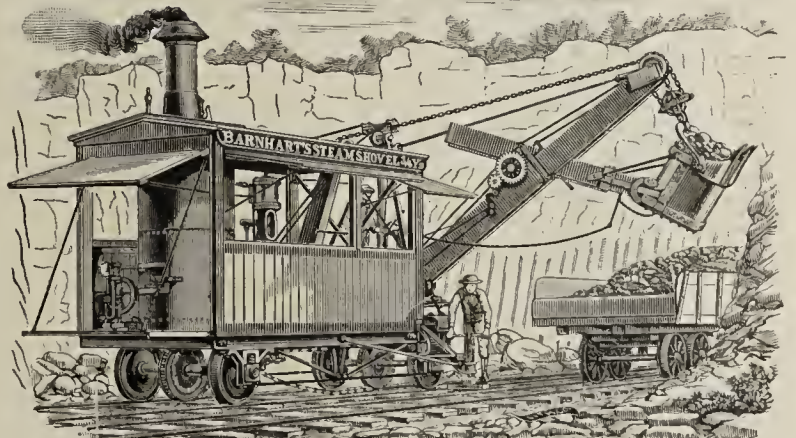
We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1 1/2 yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (3/4 yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

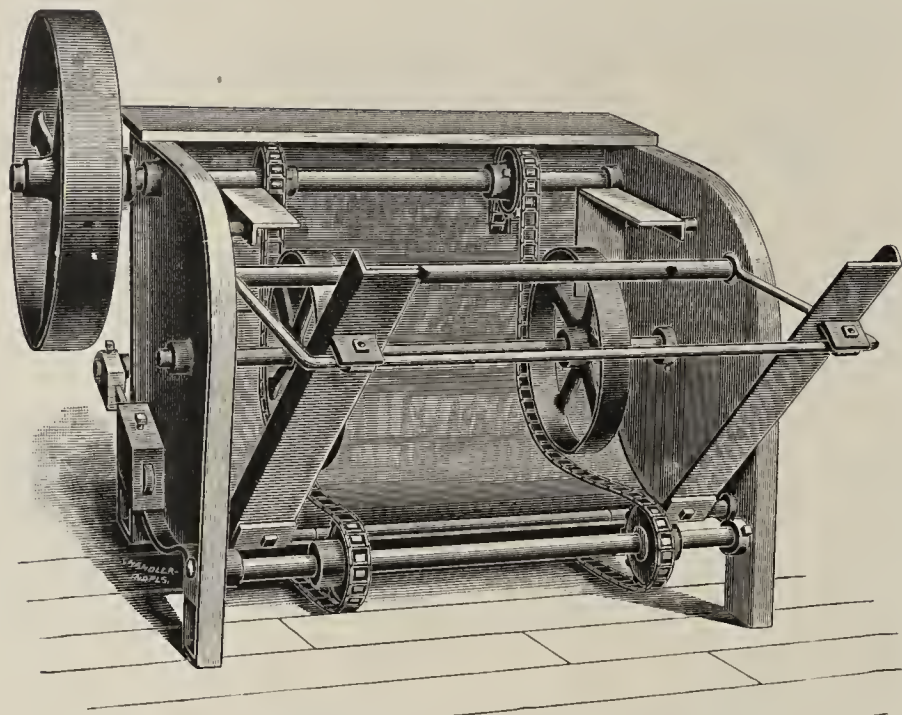
The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.



STYLE C-3/4 YD.



(PATENTED.)

The Potts Mould Sander.

MADE EITHER WITH CHAIN
or RUBBER BELT.

....

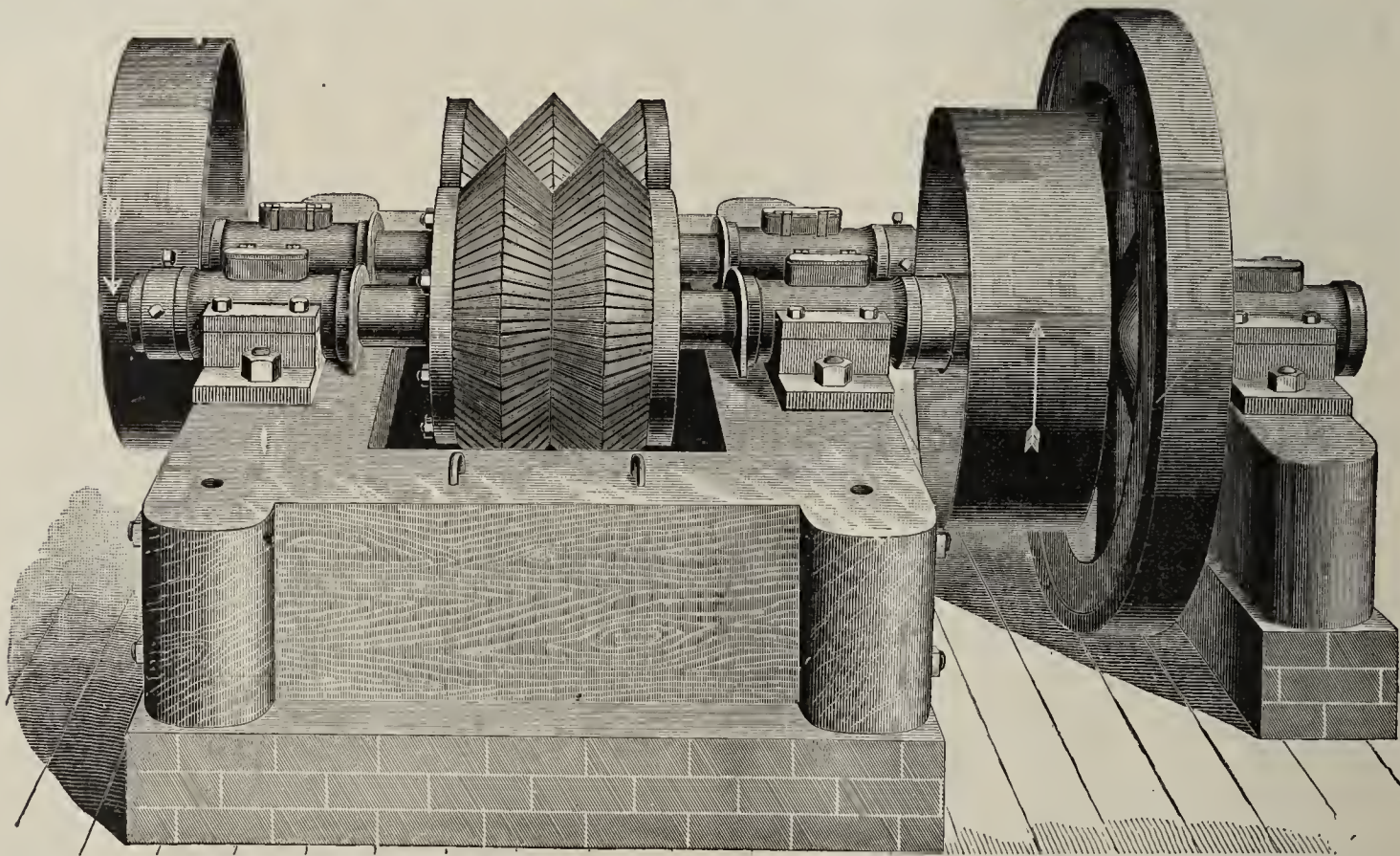
They are simple in construction, strong and durable. Never strike or get drunk. Do the work better than can be done by hand.

Now is your chance. For a short time we will sell this machine for considerably less than **\$100.** **Beware** of infringing machines.

C. & A. POTTS & CO., Indianapolis, Ind.

NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building
26 Cortland and 21 Dey Streets, New York, U. S. A.

HERE'S YOUR OPPORTUNITY

Positively the Greatest Bargain Ever Offered!

8 LARGE VOLUMES. Nearly 4,000 pages. Over 300 Colored Maps, Charts, and Diagrams. Every Volume Mechanically Perfect.



The Only Encyclopedia Strictly "Up to Date."
SIZE OF VOLUME:
2 ins. Thick. 8½ ins. Wide. 11½ ins. Long.

For Daily Use in Your Home or Office

and especially to aid the young folks in their studies, no single work in the world equals that matchless Reference Library,

The New Standard American Encyclopedia

A SUPERB REFERENCE WORK

treating over 60,000 topics (10,000 more than any other encyclopedia), covering the entire field of human knowledge, thought, and endeavor.

FRESH FROM THE PRESS

The NEW STANDARD AMERICAN ENCYCLOPEDIA is brought down to the present time, and contains hundreds of articles on subjects not treated in any other reference work. Another important feature in which it stands absolutely alone is its very full Appendixes, which embrace over 100 subdivisions, including a Biographical Dictionary, a Dictionary of Technical Terms, a Gazetteer of the United States, Statistics of Presidential Elections, State and Territorial Elections, Religious Summaries, Statistics of the Population of the World, and a Veritable Mine of Other Information on thousands of subjects of universal interest and importance.

IT IS NOW THE STANDARD

Every school, college, court and public library, where the work has been thus far introduced, has immediately given it the preference over all others.

For a Limited Time Only—
Just to Introduce the work

ONE DOLLAR

secures IMMEDIATE POSSESSION OF the entire set of 8 volumes. Balance payable \$1.50 monthly for one year.

You thus at once secure this splendid set of books for continued use and enjoyment. It is the One Great, Practical Reference Library for the Professional and Business Man, the Teacher, the Student, the Farmer, Artisan, and Mechanic.

**MAGNIFICENTLY
ILLUSTRATED
THROUGHOUT**

With over 3,500 engravings, of superb quality and wonderful variety, including numerous engraved portraits of distinguished Poets, Authors, Physicians, Chemists, Philosophers, and Scientists, and with over 300 new maps and charts from the VERY LATEST EXPLORATIONS and SURVEYS, delineating Continents, Empires, Countries, States, Cities, Towns, Citadels, Solar, Lunar, and Planetary Systems, and every portion of the known world, and forming a Complete and Indexed Atlas of the globe. THE STANDARD AMERICAN is the best illustrated and the best mapped Encyclopedia in the English Language.

Our Great Introductory Offer

To secure widespread and favorable publicity for THE NEW STANDARD AMERICAN ENCYCLOPEDIA, we have decided to place a few introductory sets in each community throughout the country for comparison with all other reference works as to plan, scope, lateness of treatment, and general practical and educational value. We feel that every set will create a demand for others. While the distribution will be general in extent, it will last for a limited time only, after which our regular subscription sale will begin, at prices ranging from \$48 to \$72 a set, according to style of binding. Now, however, to quickly and thoroughly introduce the work, as above stated, we make the price merely nominal (about the cost of paper and printing), the distribution being limited to a very few weeks, reserving the privilege of withdrawing the offer at any time when we consider a sufficient number of these introductory sets, at the special price, has been distributed.

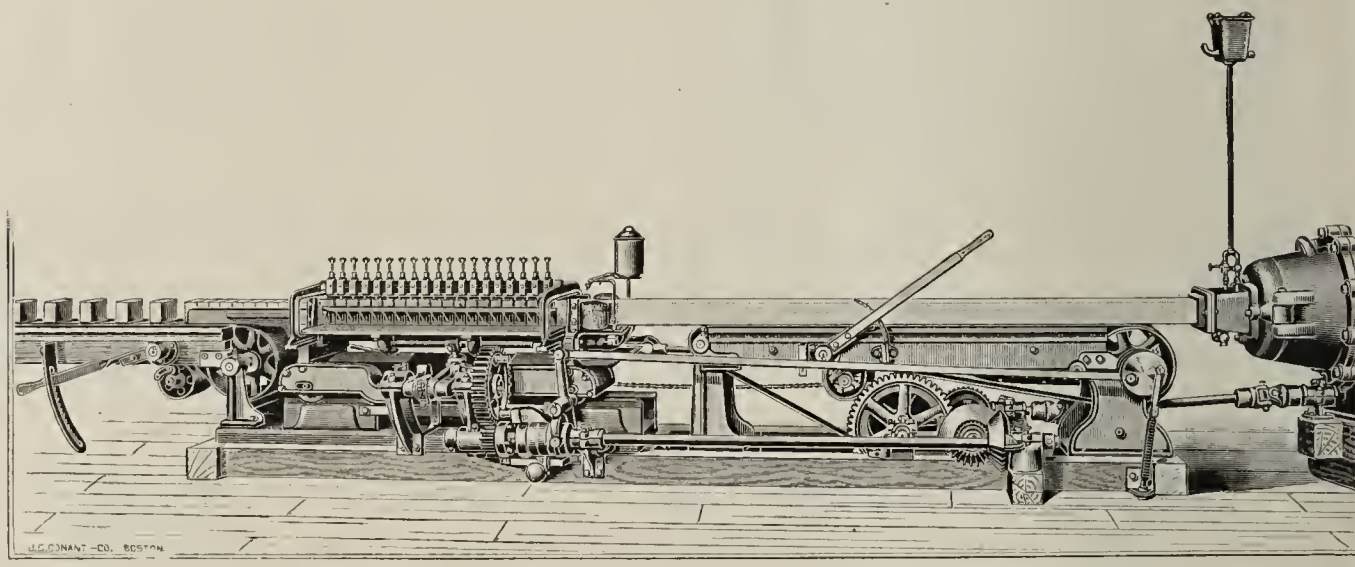
**HOW TO SECURE
ONE OF THESE
SPLENDID SETS**

Send \$1 to THE ENCYCLOPEDIA PUBLISHING CO., 156 Fifth Avenue, New York city, and a full set of eight volumes of THE NEW STANDARD AMERICAN ENCYCLOPEDIA in cloth binding, will be forwarded to you. The balance is payable at the rate of \$1.50 monthly for one year, or about 5 cents a day. If you prefer the half-morocco binding, the monthly payment will be \$2, and for full sheep, \$2.50 per month for the year. We recommend the half-morocco style, which is particularly elegant and serviceable, and will last a lifetime. If not as represented any set may be returned within ten days and money will be promptly refunded. Owing to the nominal price at which these introductory sets are sold, transportation charges must be paid by purchaser. Our confidence that the volumes will be cheerfully paid for is shown by sending a \$48 set of books on payment of only \$1. We also feel that you will thoroughly appreciate the superb new work and speak favorably of it to others. Sample pages, with specimen illustrations, will also be sent on application until the offer is withdrawn. We refer you to the publisher of this newspaper. Always mention name of paper you see this offer in. Address

**THE ENCYCLOPEDIA PUBLISHING CO., 156 FIFTH AVENUE,
NEW YORK, N. Y.**

It Never Disappoints!

OUR Automatic Side-Cut Table, here shown, is recognized as having many points of superiority. Being the pioneers in the Automatic Table field, as well as in most other noted improvements in brick and tile machinery, we have the most experienced artisans in this line. Our research for the best has been constant and tireless and we have no hesitation in leaving the trade to test our machines and render such verdict as they may see fit.



AUTOMATIC CUTTER AND SEPARATOR FOR SIDE-CUT BRICK.

If you have any idea of increasing your capacity, write us; we will tell you fully what our **Automatic Cutting Table** will do for you. It is a money maker and a money saver. Better write to-day, we may be able to show you how to make some needed changes at very little cost, which will nearly double your capacity, and that too at no extra expense for labor.

Have you seen our 1897 Catalogue. Its yours for the asking.

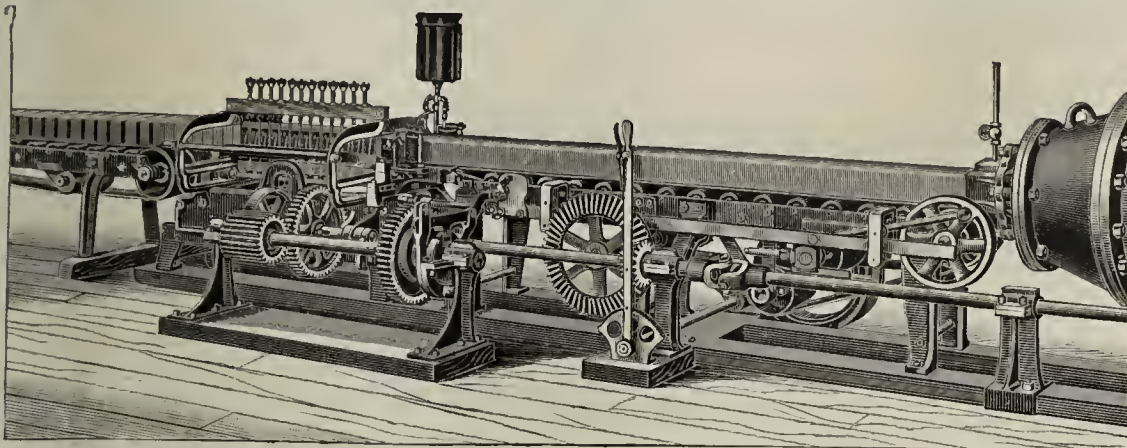
DOING
BEATS
PROMISING.



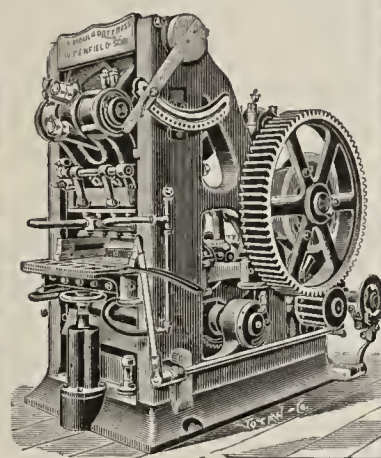
The American Clay-Working
Machinery Company,

BUCYRUS, OHIO.

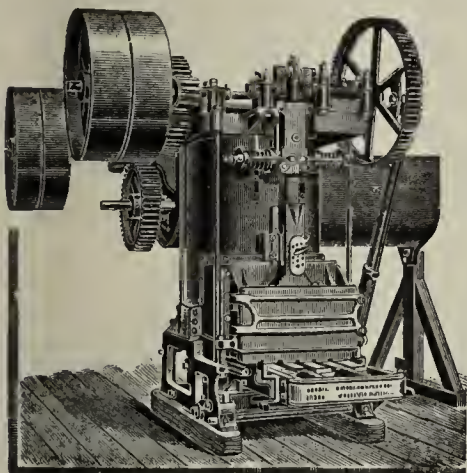
Ring us Up,
Long Distance Phone No. 90.



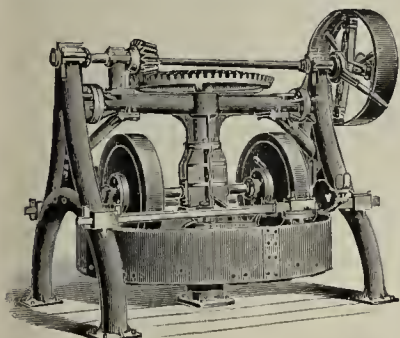
Automatic and Hand Power Brick Cutters.



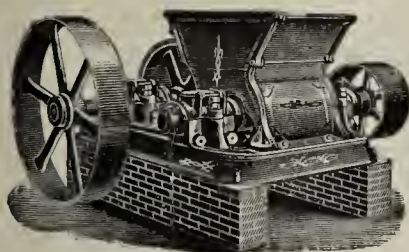
Dry Press Brick Machines.



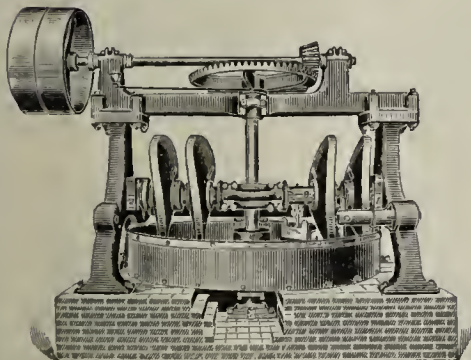
Sand Mold Brick Machines.



Dry and Wet Pans.



Disintegrators.



Special Clay Grinding Mills.

THE WINNING LINE.

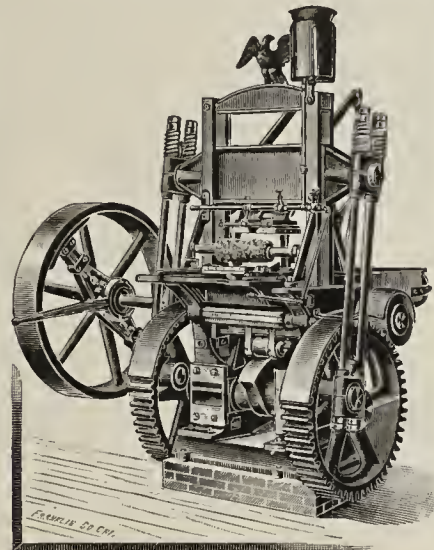
In machinery, as in everything else, the best is most economical in the long run. There is but one 'Best' and our constant effort and aim has been to win for our line this desired title.

Those who are using our machinery affirm that our efforts have not been in vain. All that experience and genius can devise, are embodied in every machine in our line. This coupled with honest construction under the eye of skilled experts, make a combination which insures your being pleased and not disappointed. Our machinery can be depended upon in any emergency.

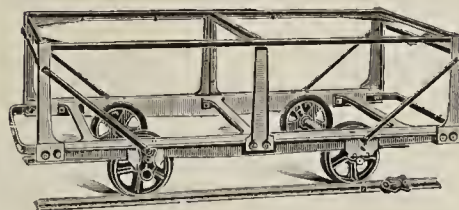
You are in business for the money there is in it; with our line of Brick and Tile Machinery, we can help you attain your object. You are progressive and will want to improve. Write us to-day, we can assist you at very moderate cost. If you have not yet seen our new and complete catalogue, send for it at once. It is yours for the asking.

The American Clay-Working Machinery Co.,
Bucyrus, Ohio.

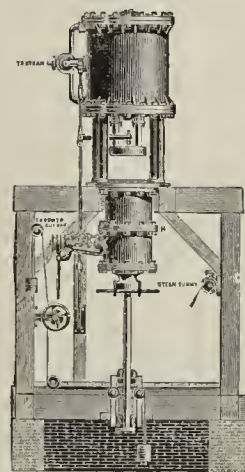
Long Distance Phone No. 90.



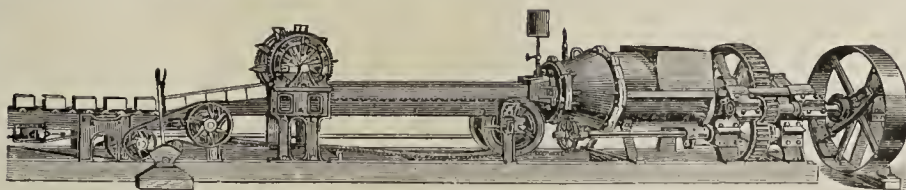
Brick Re-Presses.



No. 2 Dry Car.



Sewer Pipe Presses.



Auger Brick and Tile Machines.

TAKE YOUR CHOICE.

EITHER IRON OR WOOD FRAME.

We guarantee either to be Up-to-Date and to make as many first-class brick as any other soft mud machine in the United States.

The cut on the right shows our Iron Horse power machine changed to a steam power. All of our Horse-powers, both wood and iron frames, can be thus changed at a small expense.

Special attention is called to the square steel shaft and heavy grinders and gearing of this machine.

If in need of a

PUG MILL,
DISINTEGRATOR,
SANDER, ELEVATOR,
TRUCKS, BARROWS,
... MOLDS, Etc.,

Write us for prices.

...

For Sale,

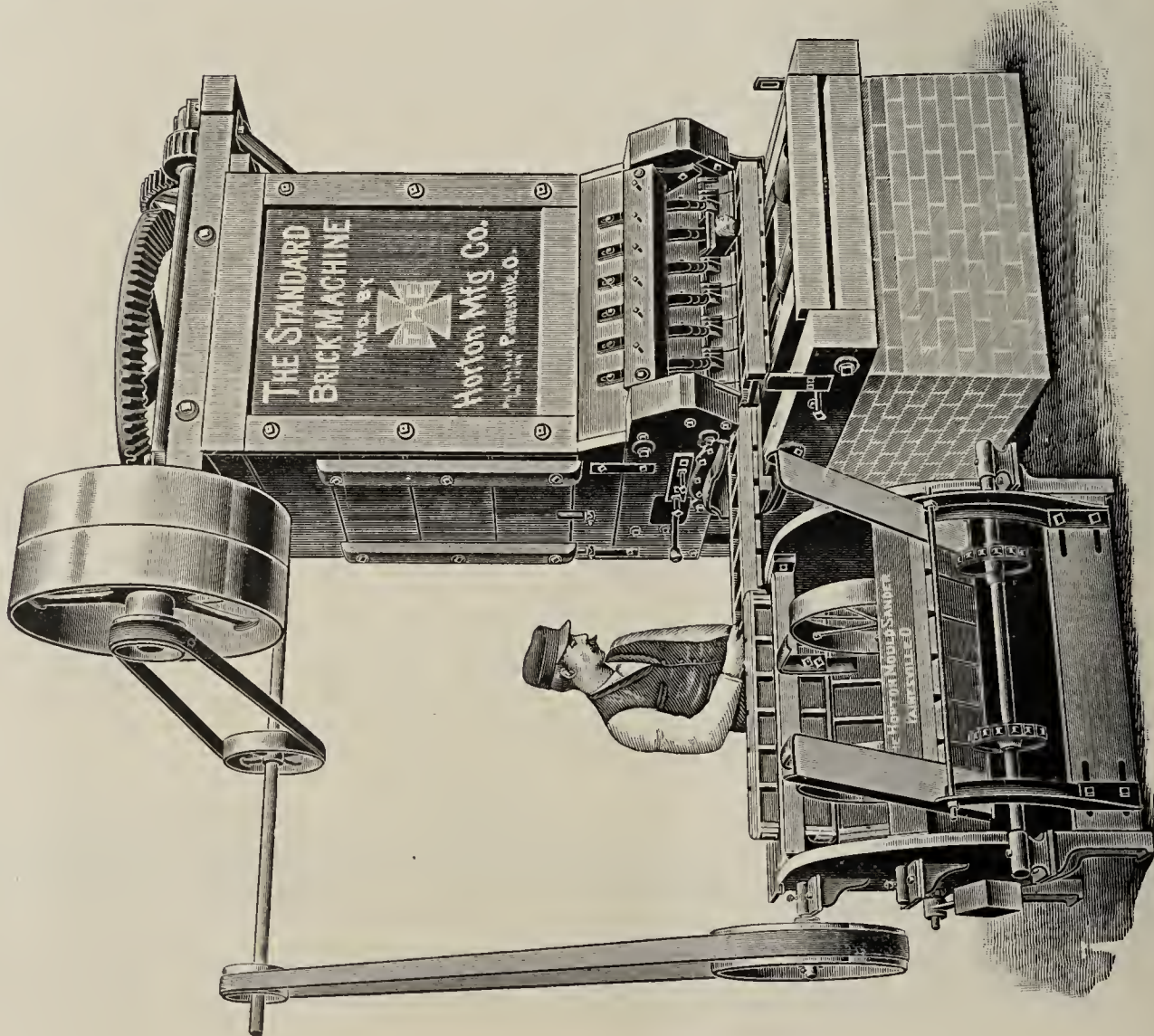
At a very low figure:

One Columbian Special Repress, second-hand but practically as good as new.

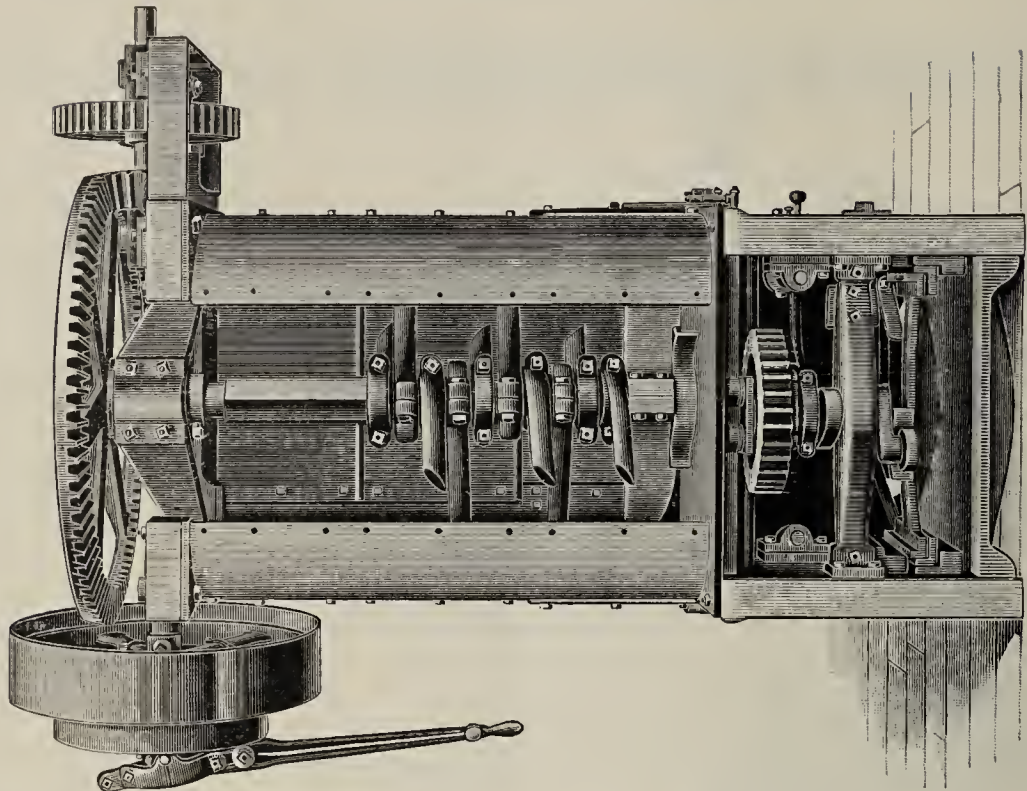
About one ton of second-hand Grates, from 40 to 42-inch length. A bargain at \$30 per ton.

Odd size molds:

5-8 1/4 x 4 1/4 x 2 1/4
10-9 x 4 3/4 x 2 1/4
10-9 1/2 x 4 1/2 x 2 1/4



"Extra Heavy" Wood Frame Steam Power with Sander Attached.



Interchangeable Iron Horse and Steam Power.

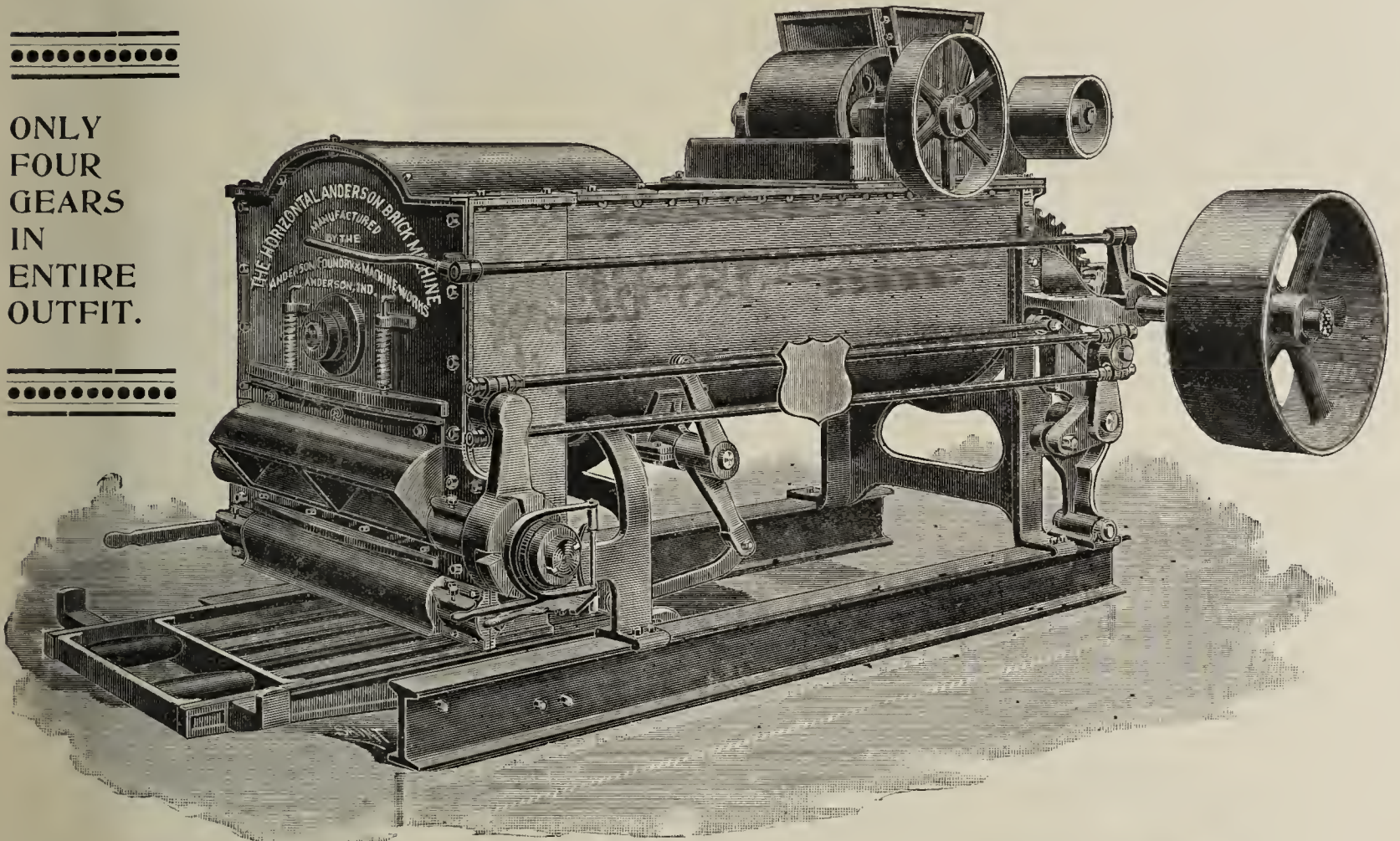
THE HORTON MANUFACTURING CO., = Painesville, Ohio.

DON'T

Greatest Pressure and Pugging Capacity.

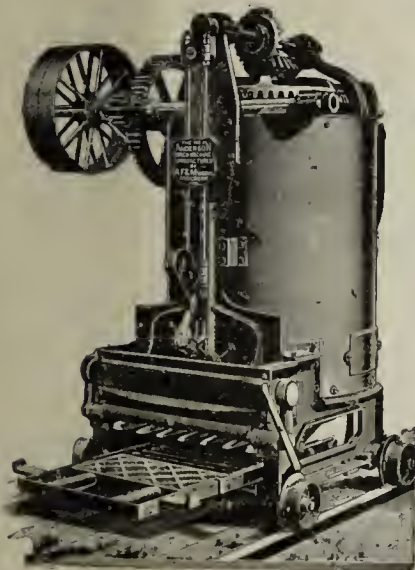
Buy a Brick Machine until you Investigate the **Horizontal Andersonson.** The latest—the Strongest—

ONLY
FOUR
GEARS
IN
ENTIRE
OUTFIT.



Brick Machinery, Pug Mills, Disintegrators.
Elevators, Moulds, Trucks and Barrows.

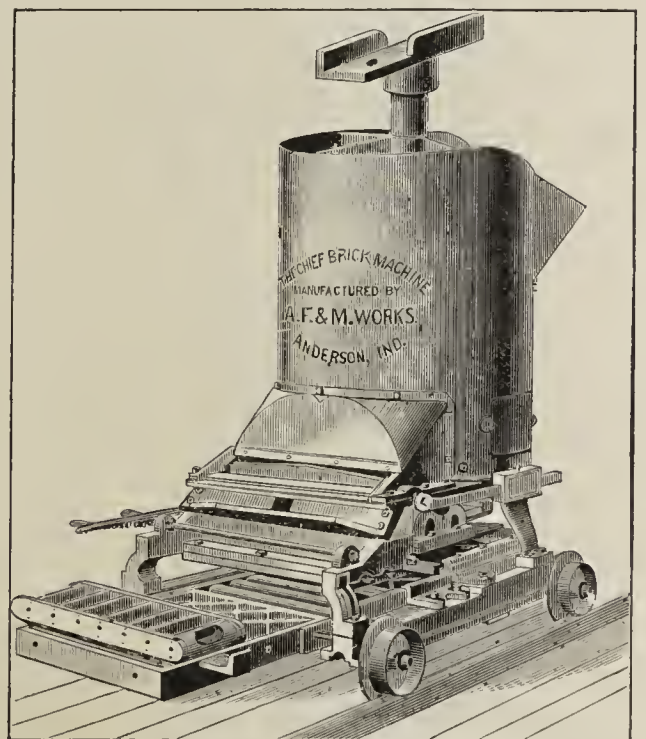
The New Departure Tile Mill



NEW ANDERSON BRICK MACHINE.
Steam Power.

The only mill for making
Tile, Pipe and Hollow
Ware, from 3 to 24-inch
diameter.

WRITE FOR CATALOGUE
AND PRICES.



NEW IMPROVED CHIEF H. P. MACHINE.

**The Anderson Foundry
& Machine Works,
ANDERSON, IND.**

A SURE THING.

...

OUR SPECIALTY IS MACHINES FOR

Sand Moulded Brick.

THE OLD AND RELIABLE

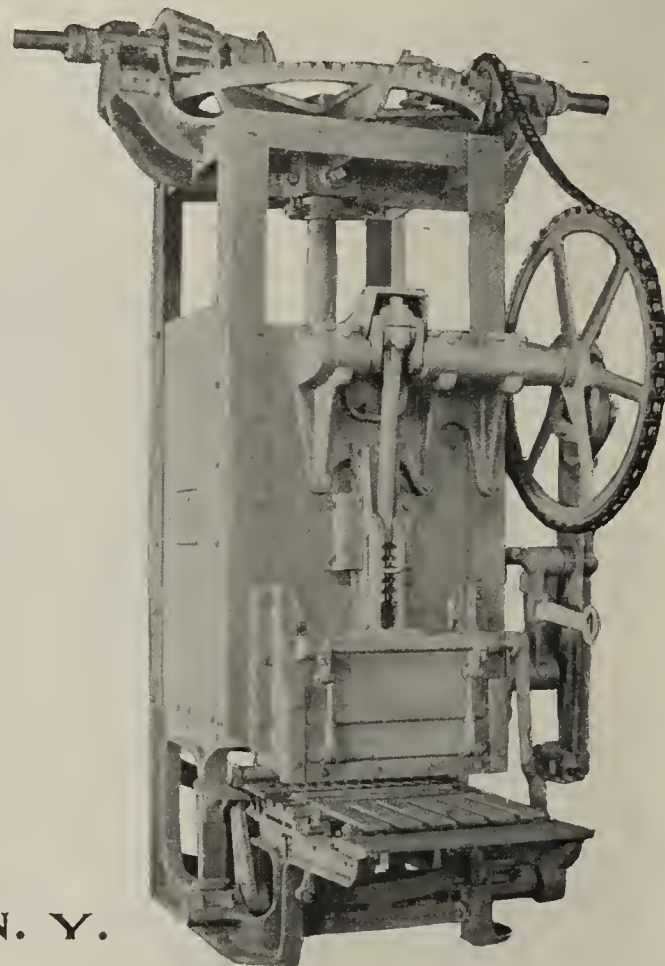
Soft Clay Process.

..

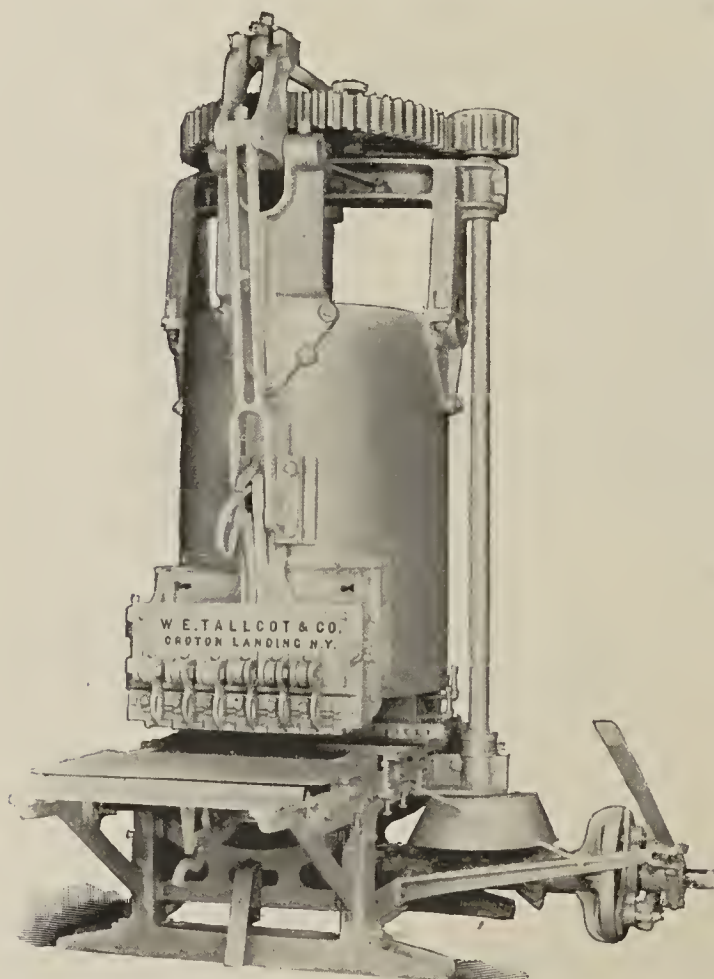
We solicit your inquiries, address

W. E. Tallcot & Co.,

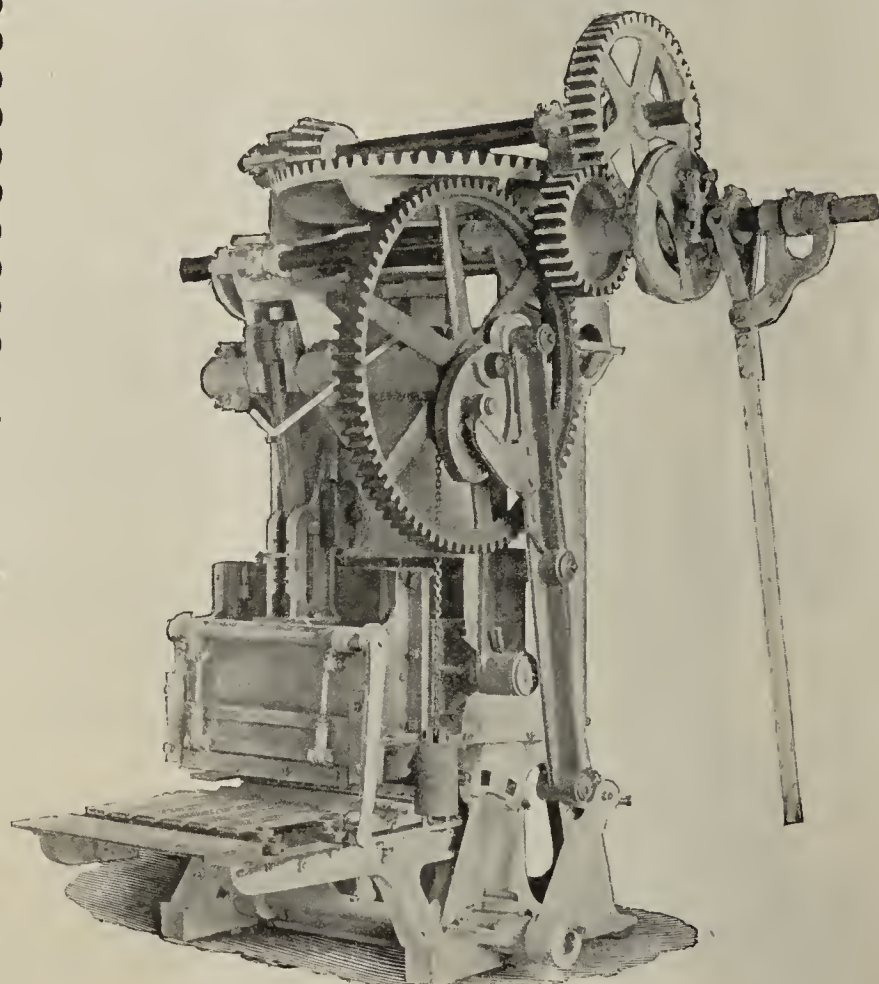
Croton-on-Hudson, N. Y.



The "Hudson River."



The "17X L."



The "Croton."

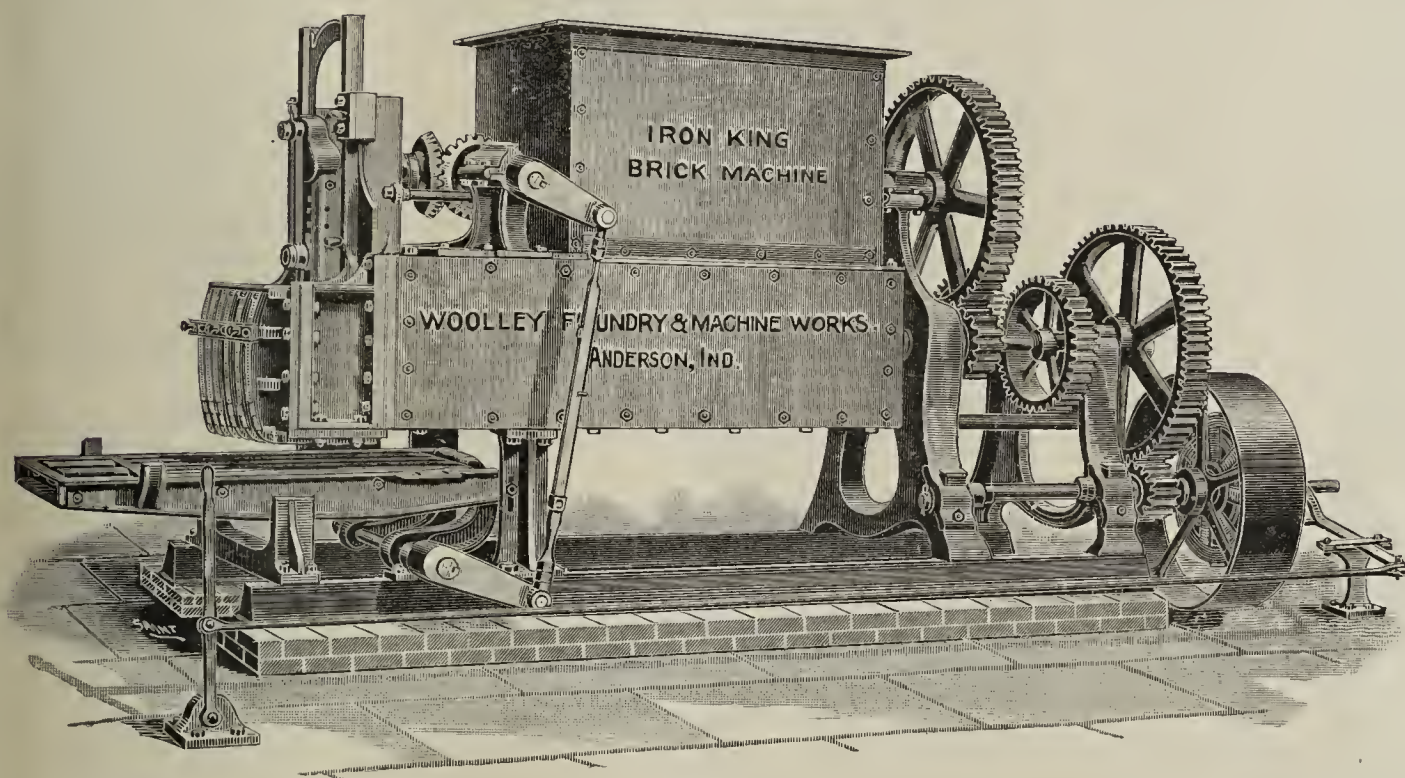
Do You Want A BRICK MACHINE A DRY PAN A PUG MILL?

IF SO, BE SURE AND LOOK INTO THE MERITS OF

The Iron King A BRICK MACHINE that has
never made a failure.

**The Woolley Dry Pan,
The Woolley Pug Mill,**

• All of these Machines have proven equal to any and Superior to most on the Market. •



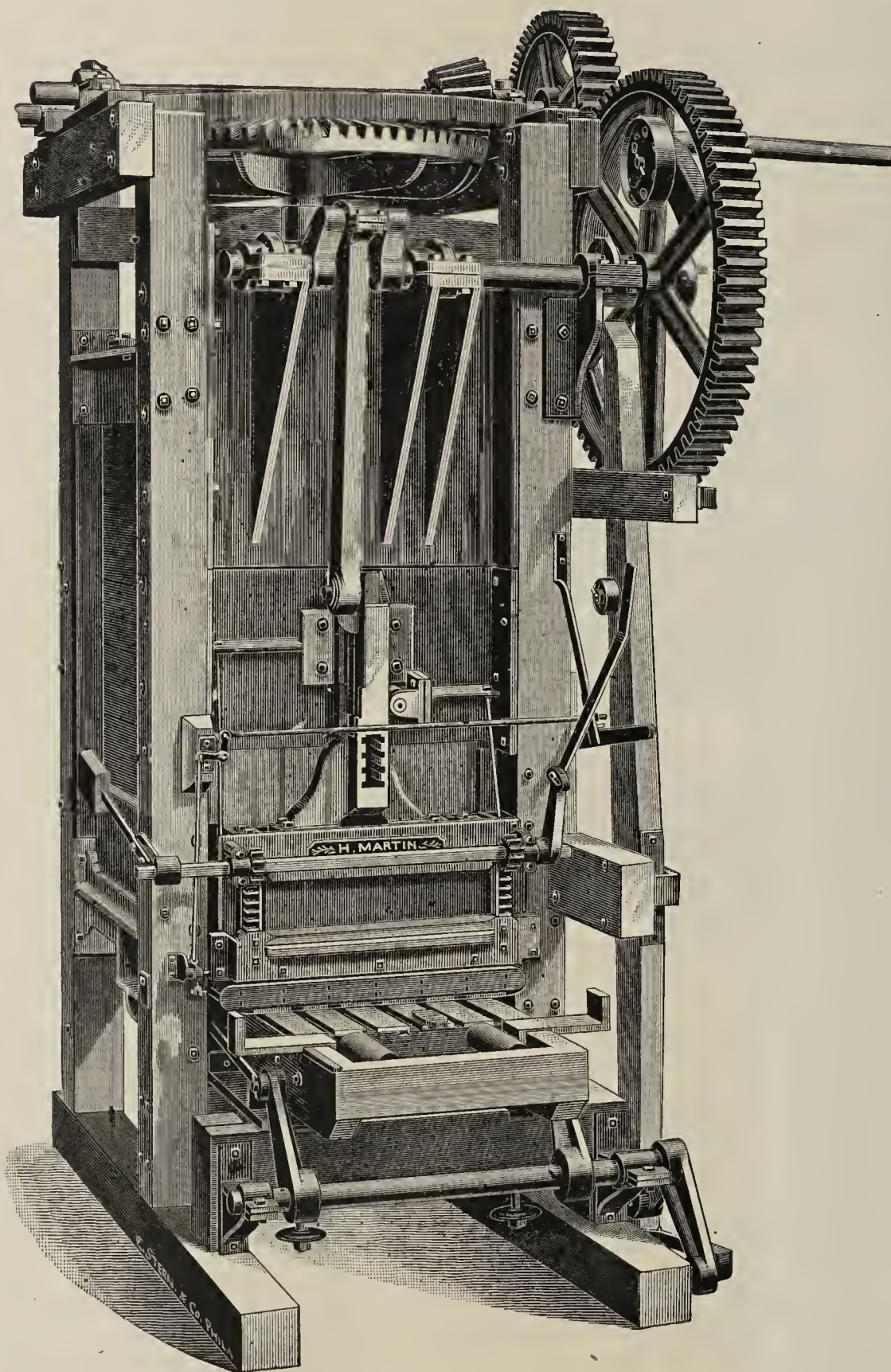
THIS is a non-breakable machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ability of every part.

We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

It will afford us pleasure to quote you prices.



The MERITS OF THE Martin Brick Machines



Have been fully established throughout the entire United States and the following demonstrates how well they have taken the lead. We have already placed in

Buffalo, N. Y.,	41 machines.
Cleveland, O.,	22 "
Pittsburgh, Pa.,	73 "
Philadelphia, Pa.,	35 "
Baltimore, Md.,	14 "
Detroit, Mich.,	5 "
Matawan, N. J.,	21 "
Lancaster, Pa.,	9 "
Rochester, N. Y.,	18 "
Toledo, O.,	13 "
Binghamton, N. Y.,	5 "
New Haven, Conn.,	19 "
Brookfield, Mass.,	9 "
Salt Lake City, Utah,	11 "
Butte City, Mont.,	8 "
Bozeman, Mont.,	4 "

The most of which are in constant use during the brickmaking season. . . . They are built for

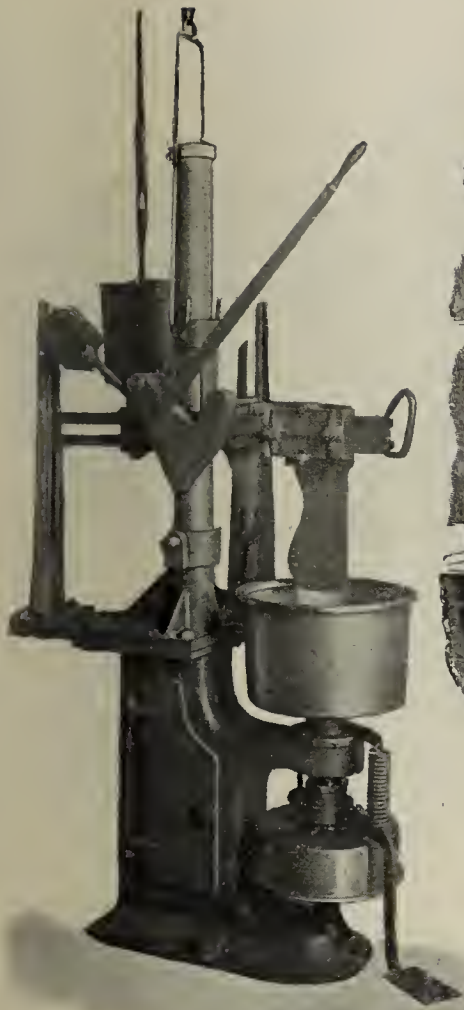
Strength,
Durability and
Large Output

of work, and are capable of moulding the clay very stiff, requiring comparatively a small amount of power.

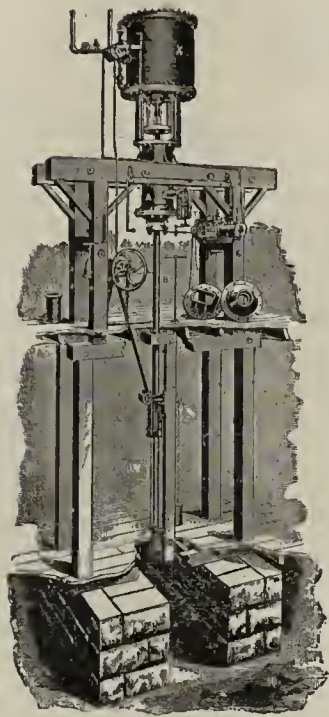
The Henry Martin Brick Machine Mfg. Co., Incorporated.

Mention the Clay-Worker.

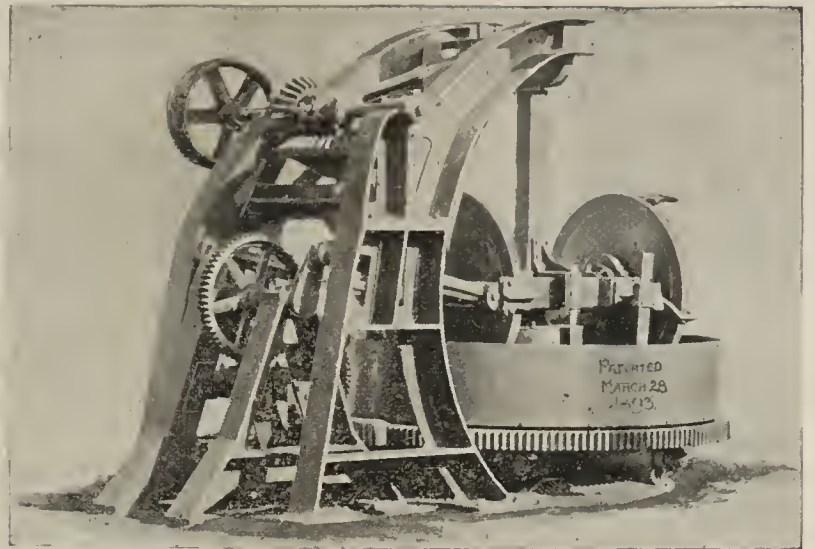
Lancaster, Penna., U. S. A.



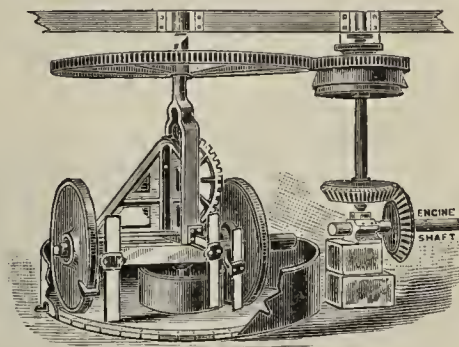
All Iron and Steel Jolly No. 3.



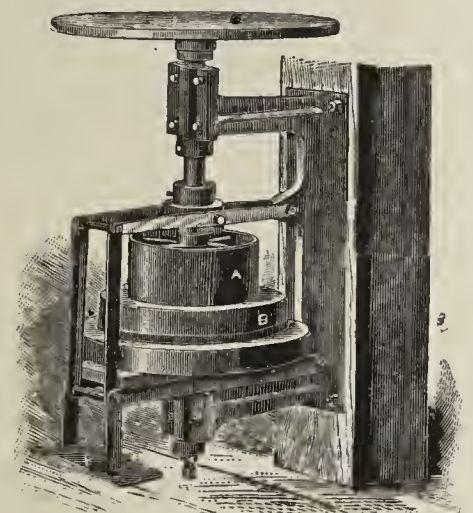
Vaughn Press.



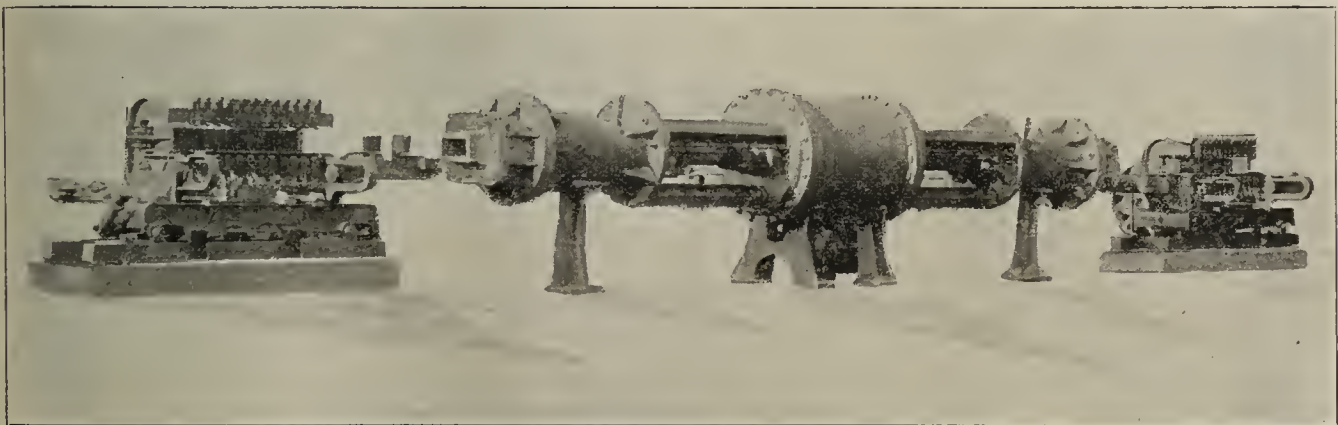
Combination Mill No. 2.



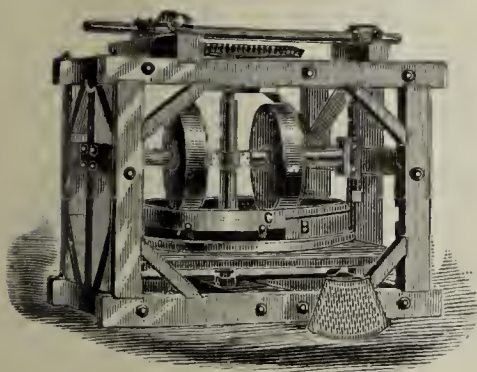
Clay Mill—Harp Pattern.



Potter's Wheel.



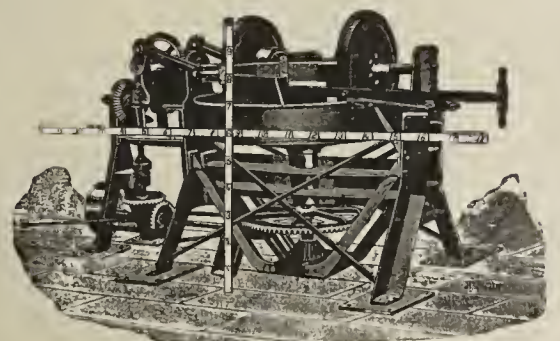
The "Cuyahoga" Double-Acting Direct Steam Pressure Brick Press No. 1.



Dry Pan.

IF you want any kind of Clayworking Machinery or device get our prices.

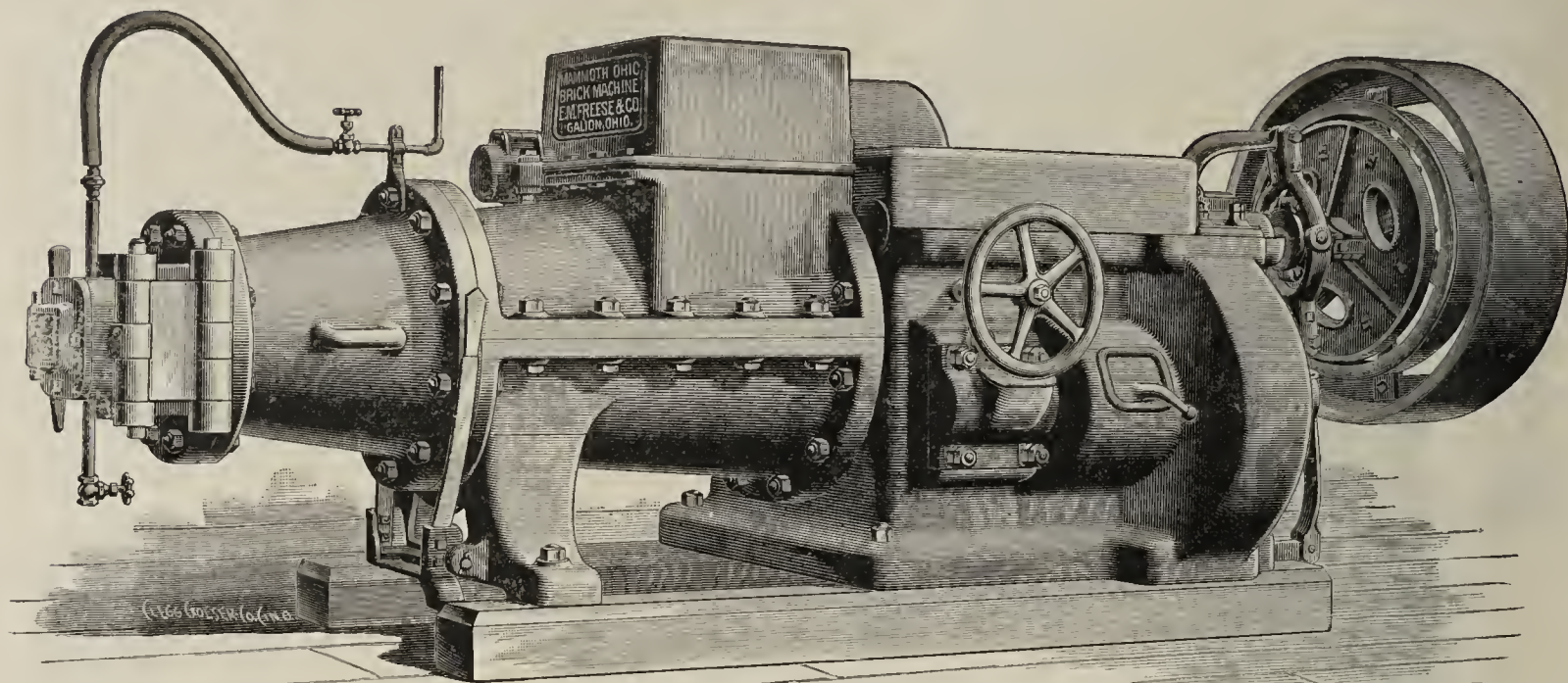
Catalogue Free.



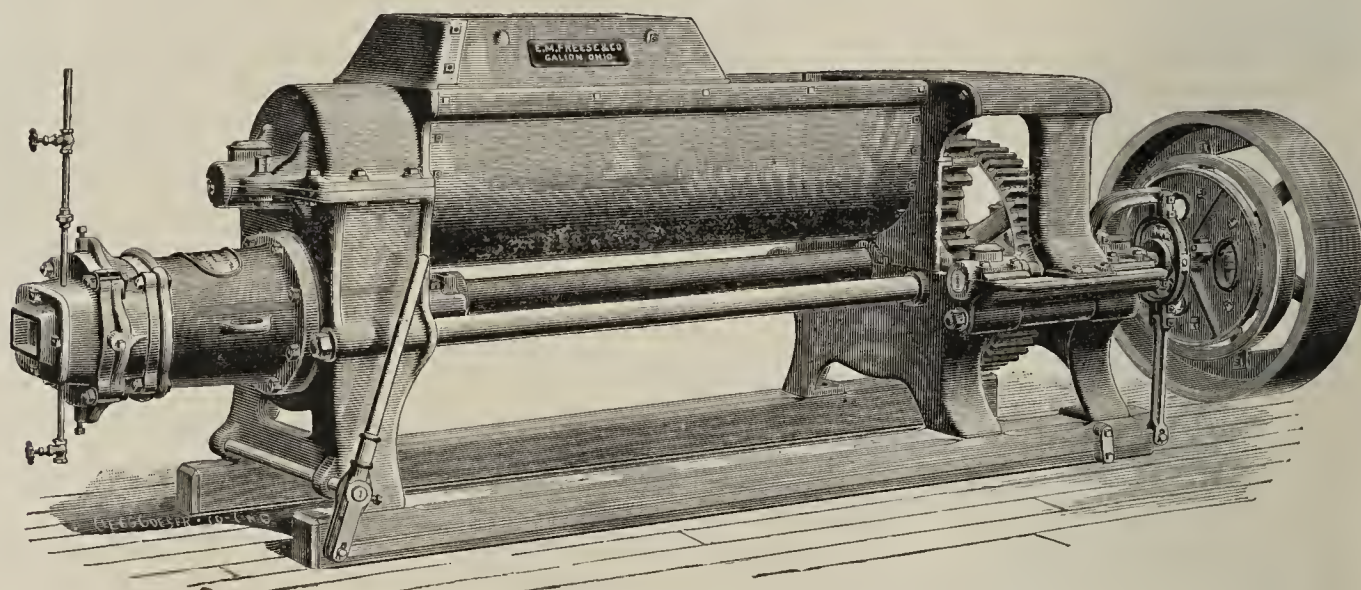
"Cuyahoga" Combination Mill, No. 1.

The Turner, Vaughn & Taylor Co., Cuyahoga, Falls, Ohio.

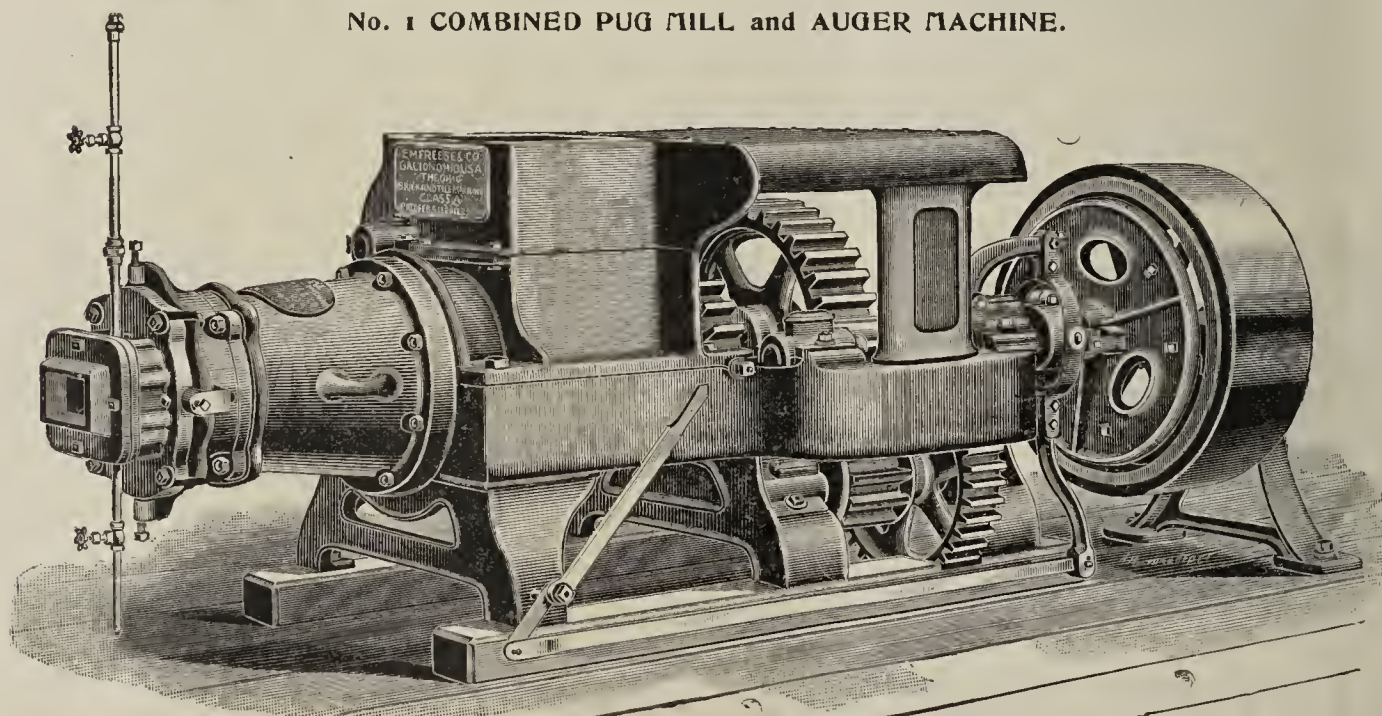
E. M. FREESE & CO., GALION, OHIO.



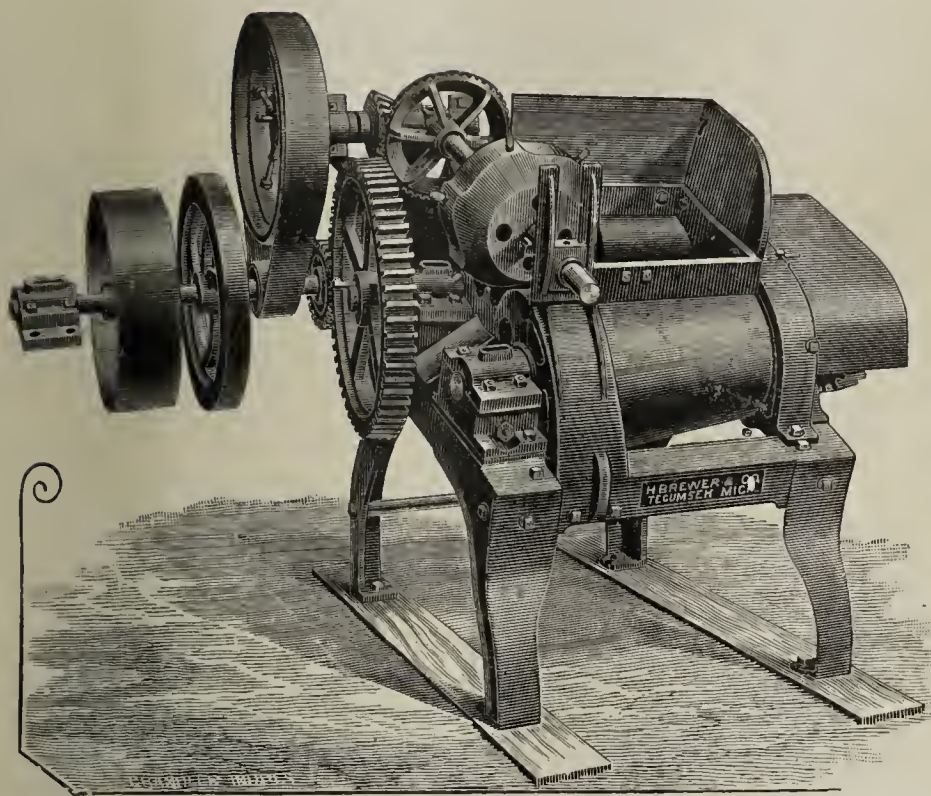
MAMMOTH BRICK MACHINE.



No. 1 COMBINED PUG MILL and AUGER MACHINE.



IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

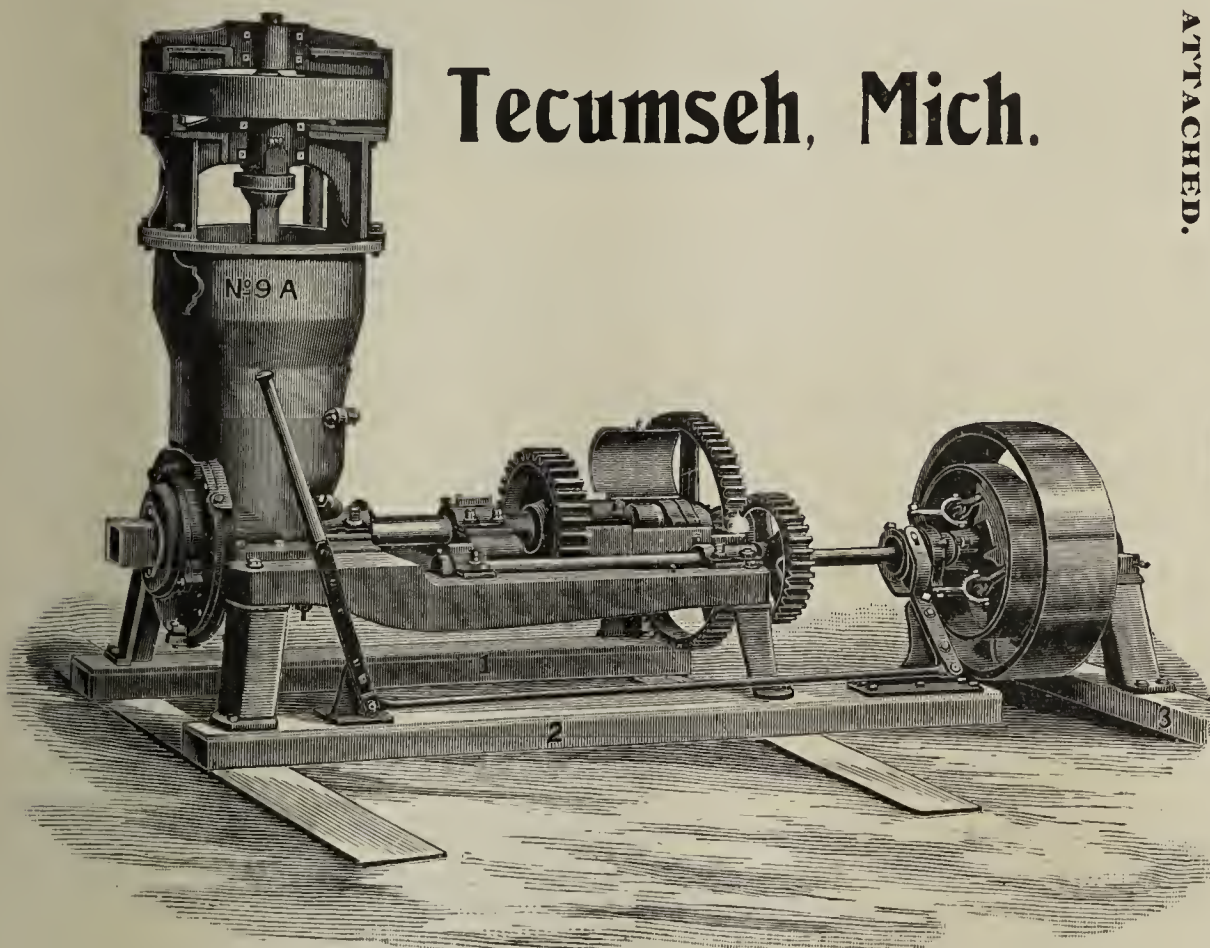


STONE EXTRACTING CLAY CRUSHER.

Manufactured by

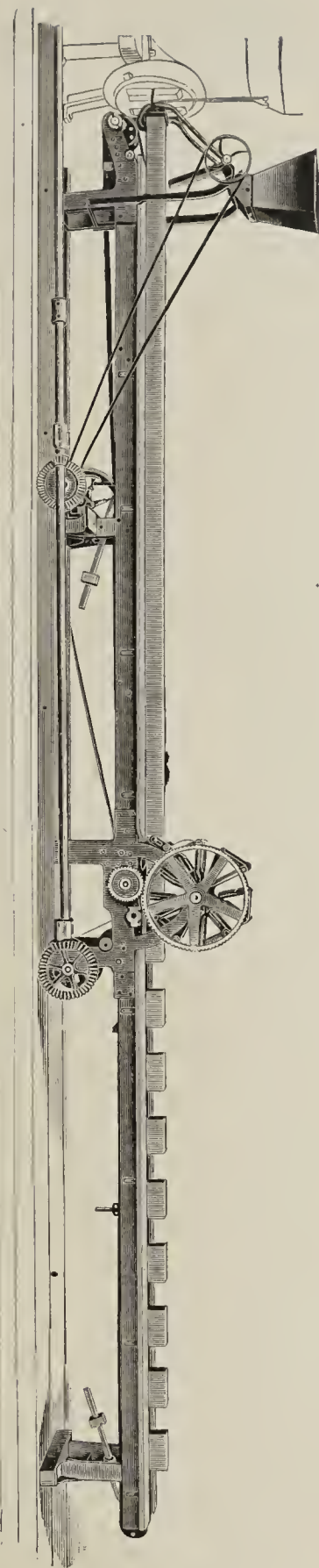
H. Brewer & Co.,

Tecumseh, Mich.

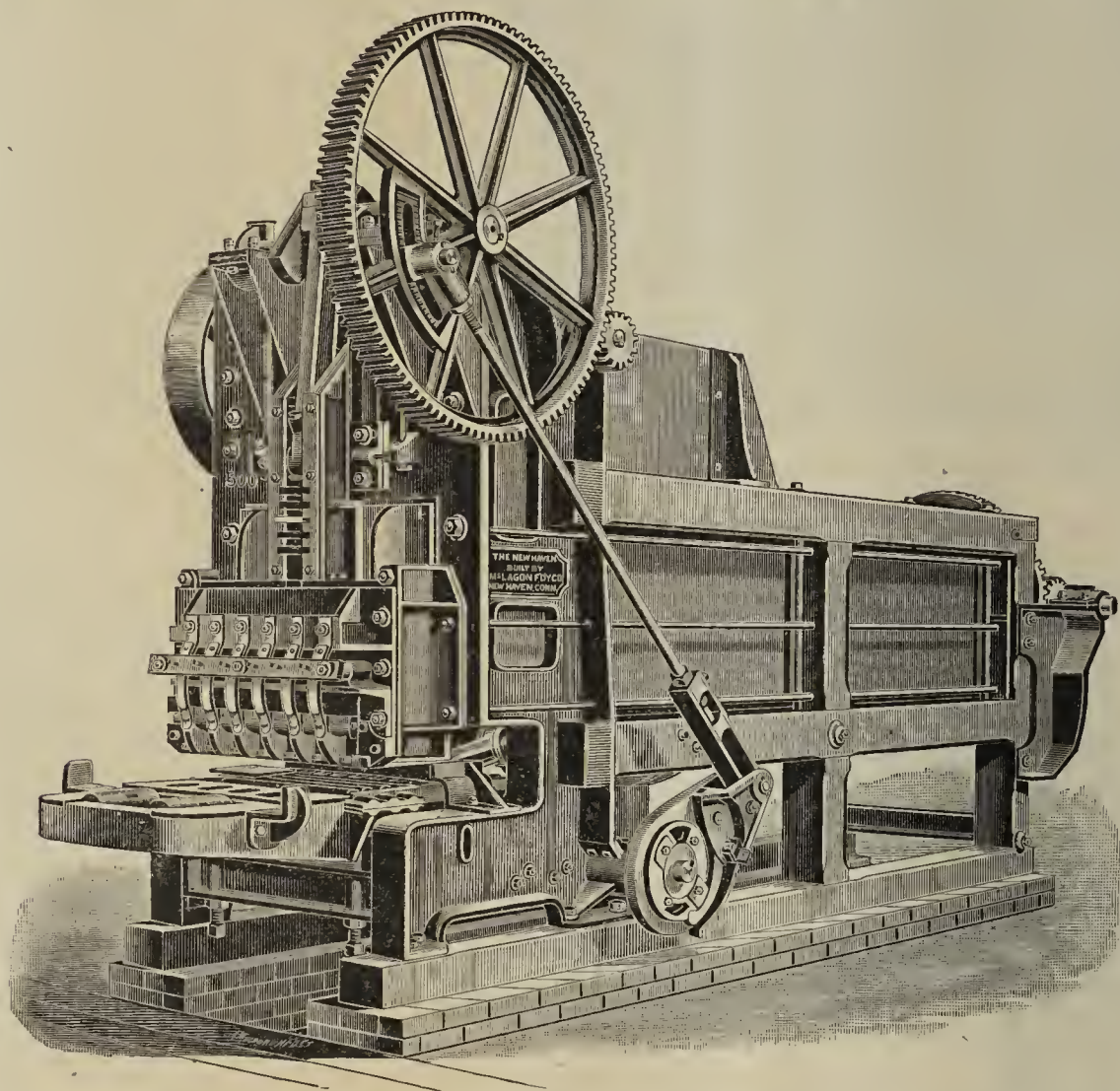


No. 9 "A" BRICK MACHINE.

AUTOMATIC END CUT BRICK CUTTER WITH SANDER ATTACHED.



After Seven Years' Experience, — Still Agrees With Us.



DANIELSON, CONN., Sept. 28, 1896.
THE EASTERN MACHINERY CO., New Haven, Conn.:

Dear Sirs—In regard to my Machine. It is the best I know of. It is all right. Always was pleased with it. Am now. Would buy another just like it if needed one. So you will see we can't fight, for we agree. Best of regards.

Very truly,
FRANK G. BAILEY.

Our Machines Wear Well. —

The Eastern Machinery Co.,

— NEW HAVEN, CONN.

WONDER MACHINERY.

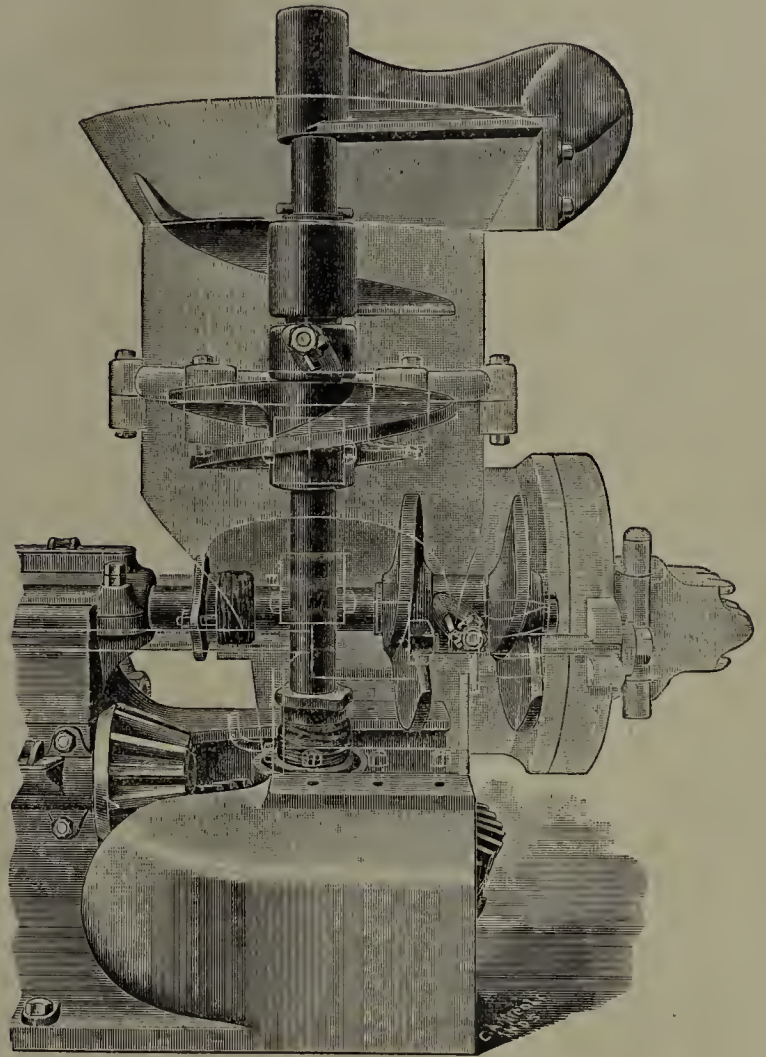
...

Transparent Cut Illustrating Arrangement of Clay Cylinder and Augers.

By this we illustrate a "Transparent" Clay Cylinder showing the inner construction of all sizes of the Wonder Brick and Tile Machines, showing position the augers and retarding bars occupy, also that there is no journal bearing that the clay can work into and also the means used to prevent the clay from working out of the clay cylinder. By this illustration you will see that we are justified in making the claim that we more thoroughly grind the clay and thereby produce brick with less lamination than can be done by the horizontal auger machines.

Automatic Brick Cutting Tables, either end or side cut, also side cut board delivery and hand brick tables are used with either size of the Wonder machines.

...

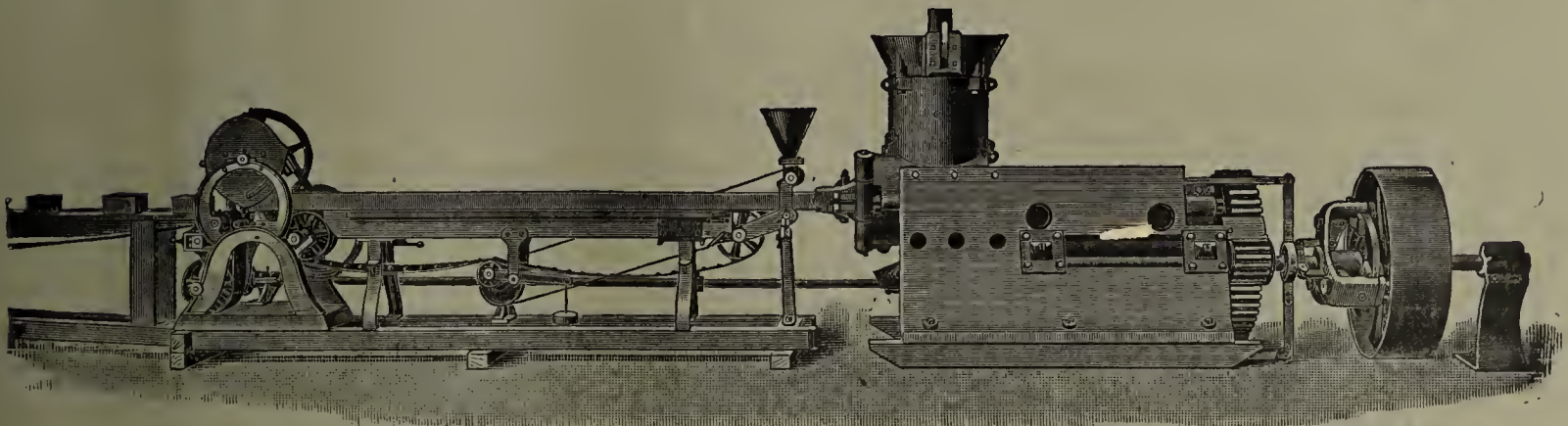


Little Wonder Brick and Tile Machine, 25 M daily capacity.

Intermediate Wonder Brick and Tile Machine, 35 M daily capacity.

Big Wonder Brick Machine, 50 to 60 M daily capacity.

Wonder No. 4 Brick Machine, 60 to 100 M daily capacity.



Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.

AS MANUFACTURED BY

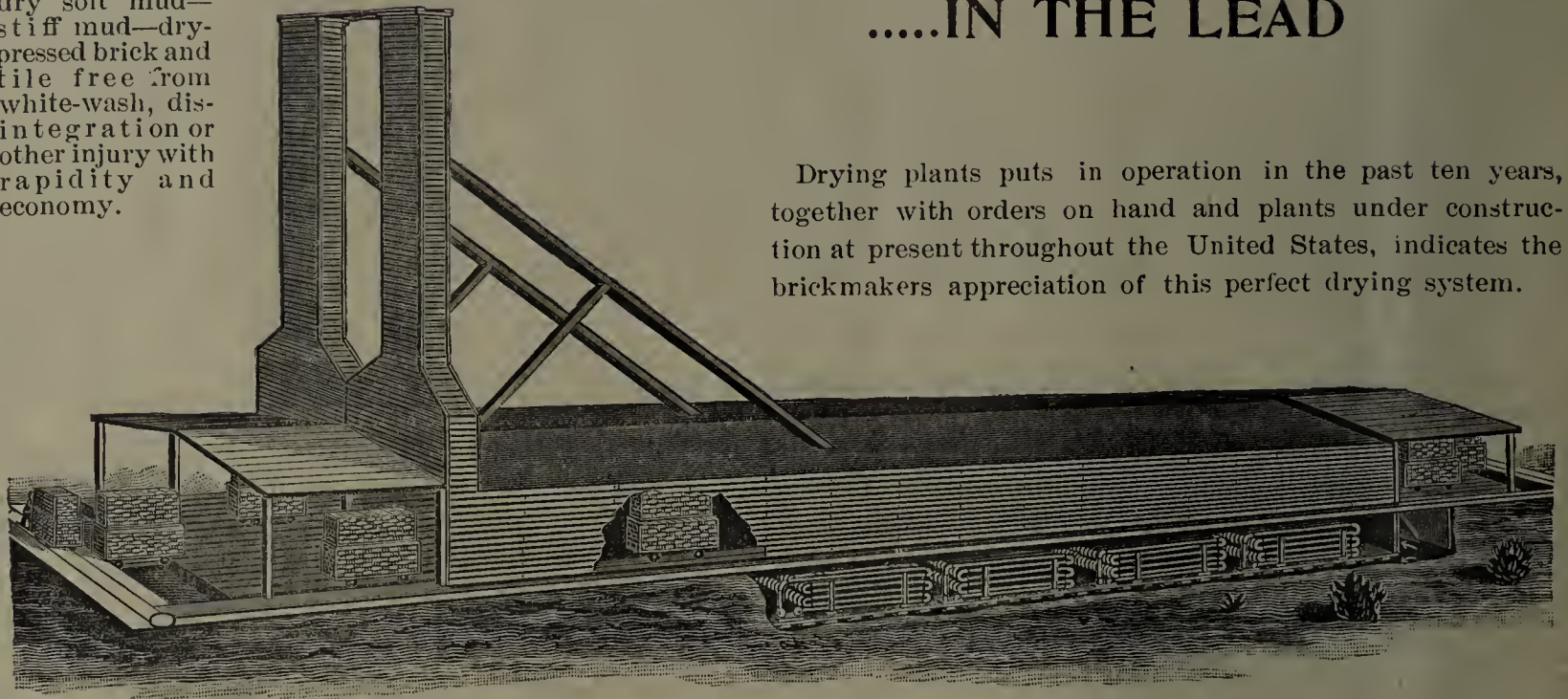
The Wallace Manufacturing Co.,

Send for No. 15 Catalogue for further particulars.

FRANKFORT, IND.

Iron Clad Dryer

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



.....IN THE LEAD

Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

SEE WHAT THEY SAY:

DALE-GOODWIN PRESSED BRICK CO.

DIRECTORS:
Robt. Goodwin, President.
F. H. Parmenter, Vice-Pres.
E. E. Dale, Sec. and Treas.
Daniel Embree.
Frank Dale.

MANUFACTURERS OF

Building Brick.

FINE FRONT BRICK A
SPECIALTY

Telephone 394.
Lock Box 303.

100 SOUTH FIFTH ST.

DES MOINES, IA., July 20, 1896.

WOLFF DRYER CO., Chicago, Ill.

GENTLEMEN—The four-track dryer bought of you has reduced the length of time in water smoking from seven and eight days to three days, evaporating from seven to nine ounces from each brick of standard size.

Our contract was for a capacity of thirty thousand standard brick per day; the dryer will easily do this.

Very truly yours,
DALE-GOODWIN PRESSED BRICK CO.,
E. E. DALE, Sec. and Treas.

D. WARREN De ROSAY,

STEAM BRICK MANUFACTURER,

Cambridge, Mass.

OFFICE AND WORKS
62, 64, 66 Dublin St.
Telephone 532-4 Cambridge.

BOSTON OFFICE
17 Old Street
Telephone 1892 Boston

CAMBRIDGE, MASS., July 29, 1896.

WOLFF DRYER CO., Chicago, Ill.

GENTLEMEN—I have used your six-track dryer since April 15, 1896, and am pleased to say that it gives entire satisfaction. It was built for a capacity of 25,000 soft mud brick per day, but at present I am running at the rate of 30,000 "BONE DRY BRICK" daily. I must confess that with this dryer the art of brick making is reduced to a science, and that the days of open yards are numbered.

Wishing you more success of the kind, I remain,

Respectfully,
D. WARREN De ROSAY.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

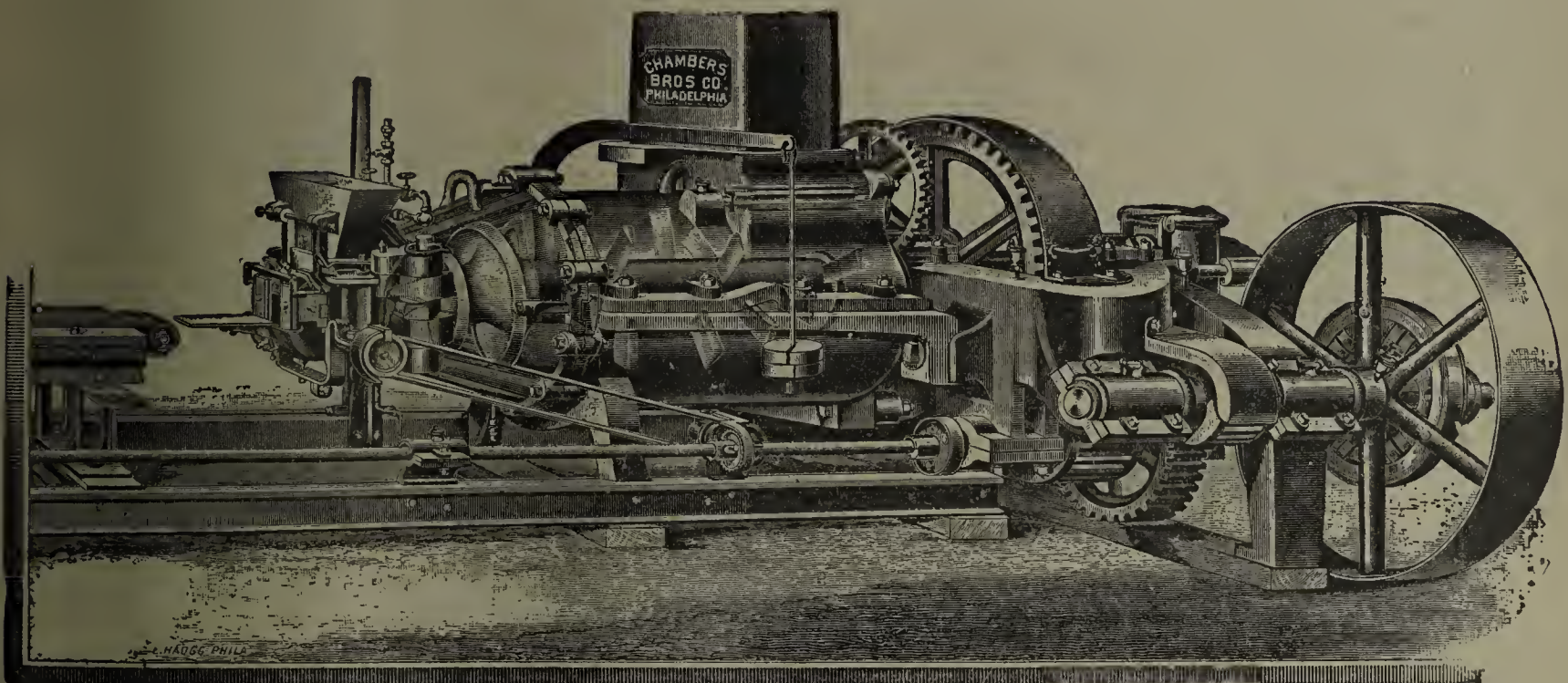
VOL. XXVII, No. 4.

INDIANAPOLIS, IND., APRIL, 1897.

\$2.00 a Year in Advance.

OUR SPECIALTY IS STIFF TEMPERED BRICK MAKING ...MACHINERY.

We aim to Build only the Best in its Class.
It has Paid our Customers to Buy and Use our Machines.
We Believe it would Pay You.



Chambers Brothers Company,

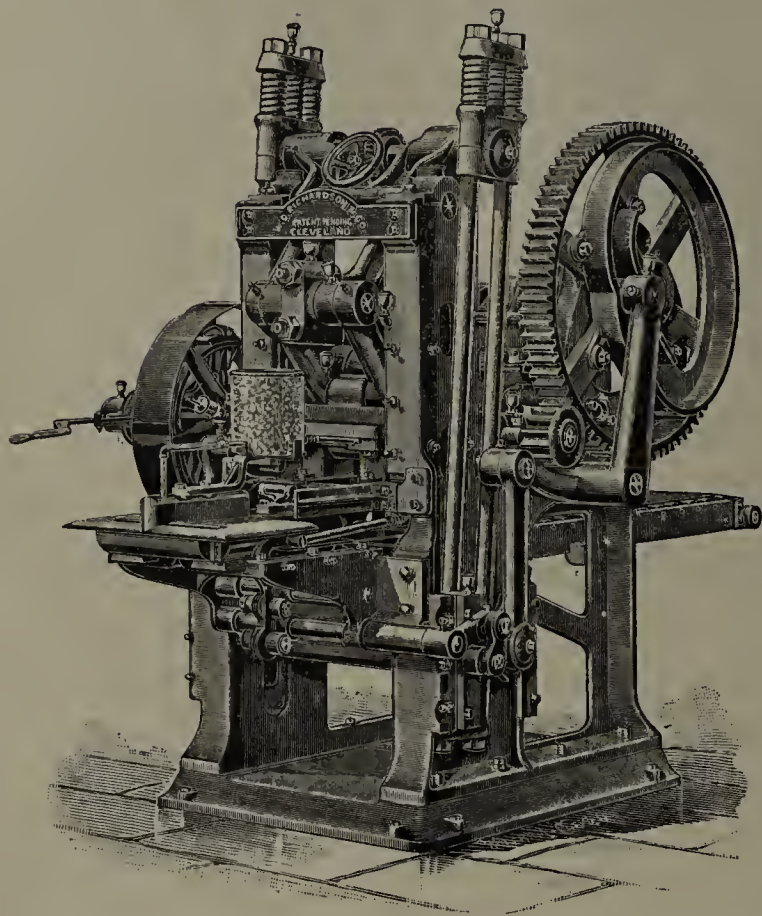
FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,

171 South Clinton Street.

PHILADELPHIA, PA.

Coming to the Front,



The RICHARDSON REPRESS.

• • • •

We have received recently orders for this Repress from three well-known brick companies—one order being for the second machine.

Two of the companies have been using Represses for years, and know a good thing when they see it.

We make brick presses for every requirement, and molds and dies for ornamentals and special shapes.

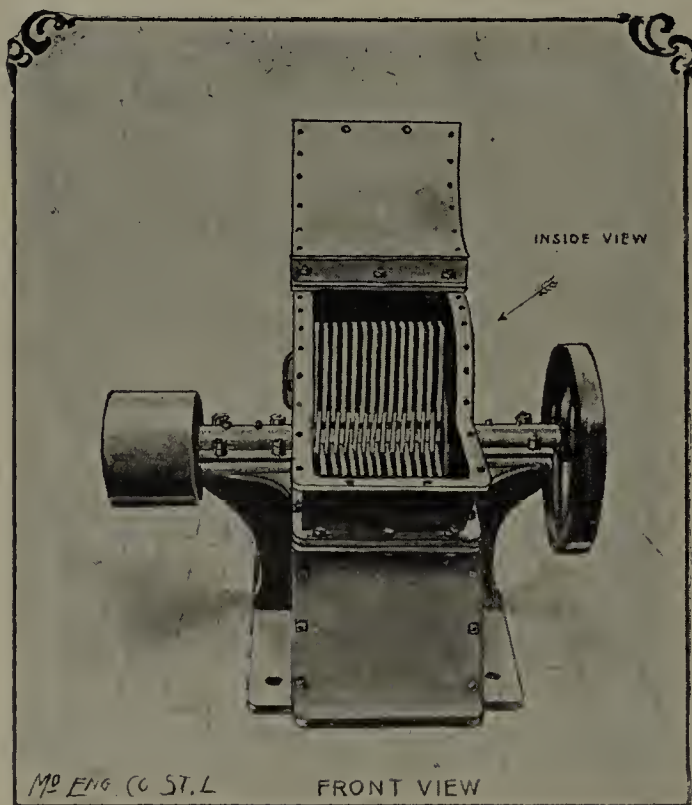
We make many other things that you ought to know about.

Write for information.

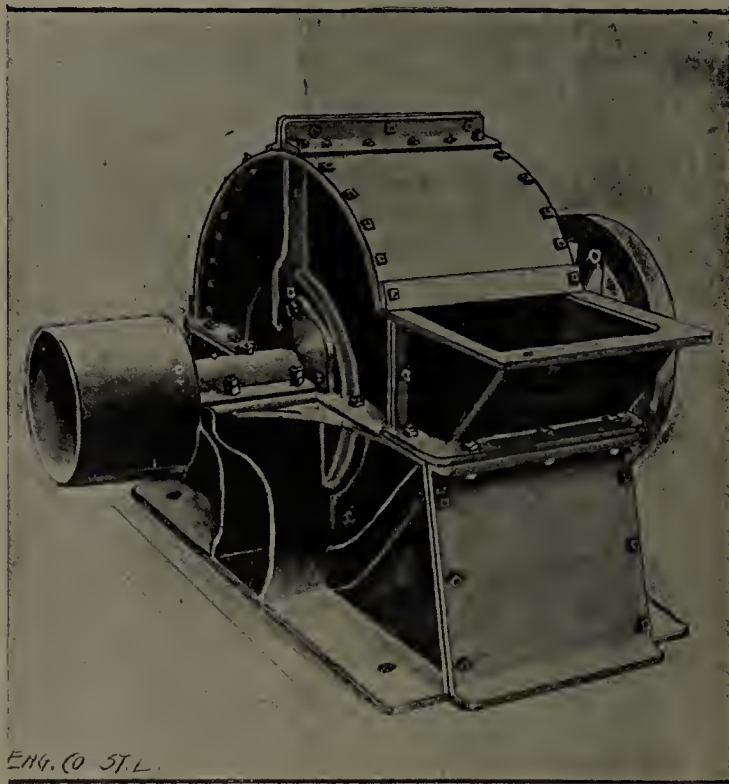
• • • •

The Ohio Ceramic Engineering Co.,

59-63 Center St., CLEVELAND, OHIO:



THESE MACHINES are FULLY GUARANTEED.



NEW IMPROVED PATENT LIGHTNING BREAKER AND PULVERIZER.

These machines are far superior to anything of the kind in the market, being provided with our patent self-oiling dust-proof boxes, they can be run at a much higher speed than any other. As the principle of pulverizing is in the momentum, or quick motion of a machine, the advantage can readily be seen. For particulars and prices call on, or address the

SCHOELLHORN-ALBRECHT MACHINE CO.,

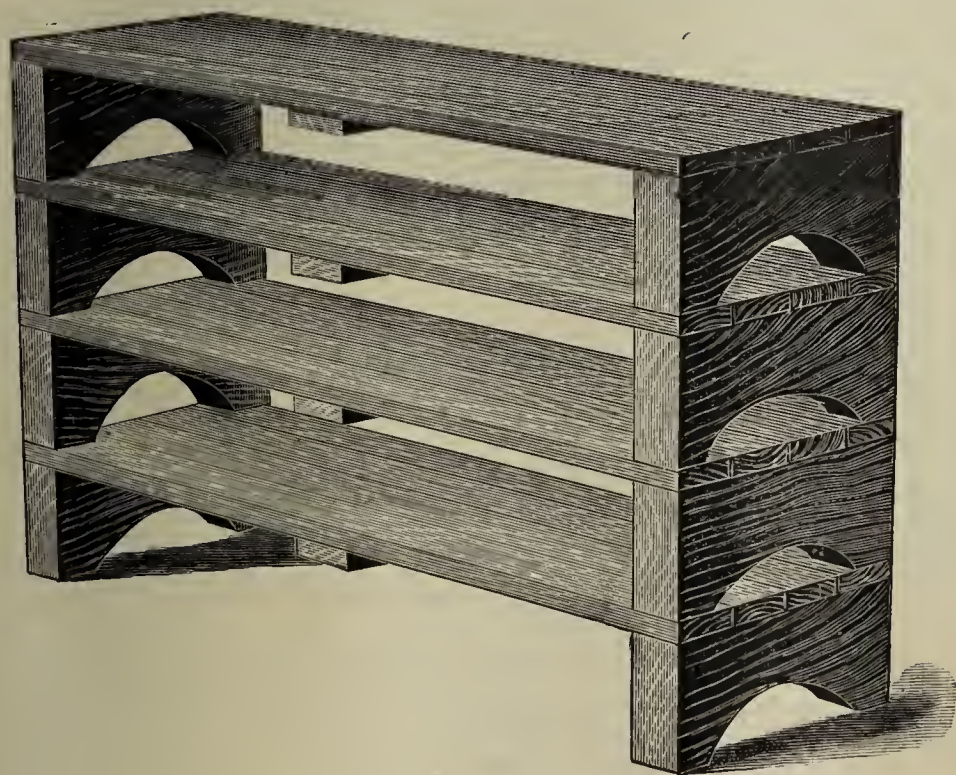
Dealers and Manufacturers of Engines,
Boilers, Machinery and Supplies of
all Description.

609 and 610 North Levee, St. Louis, Mo.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.



IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also *Decks for Dry Cars.*

We can ship them anywhere.

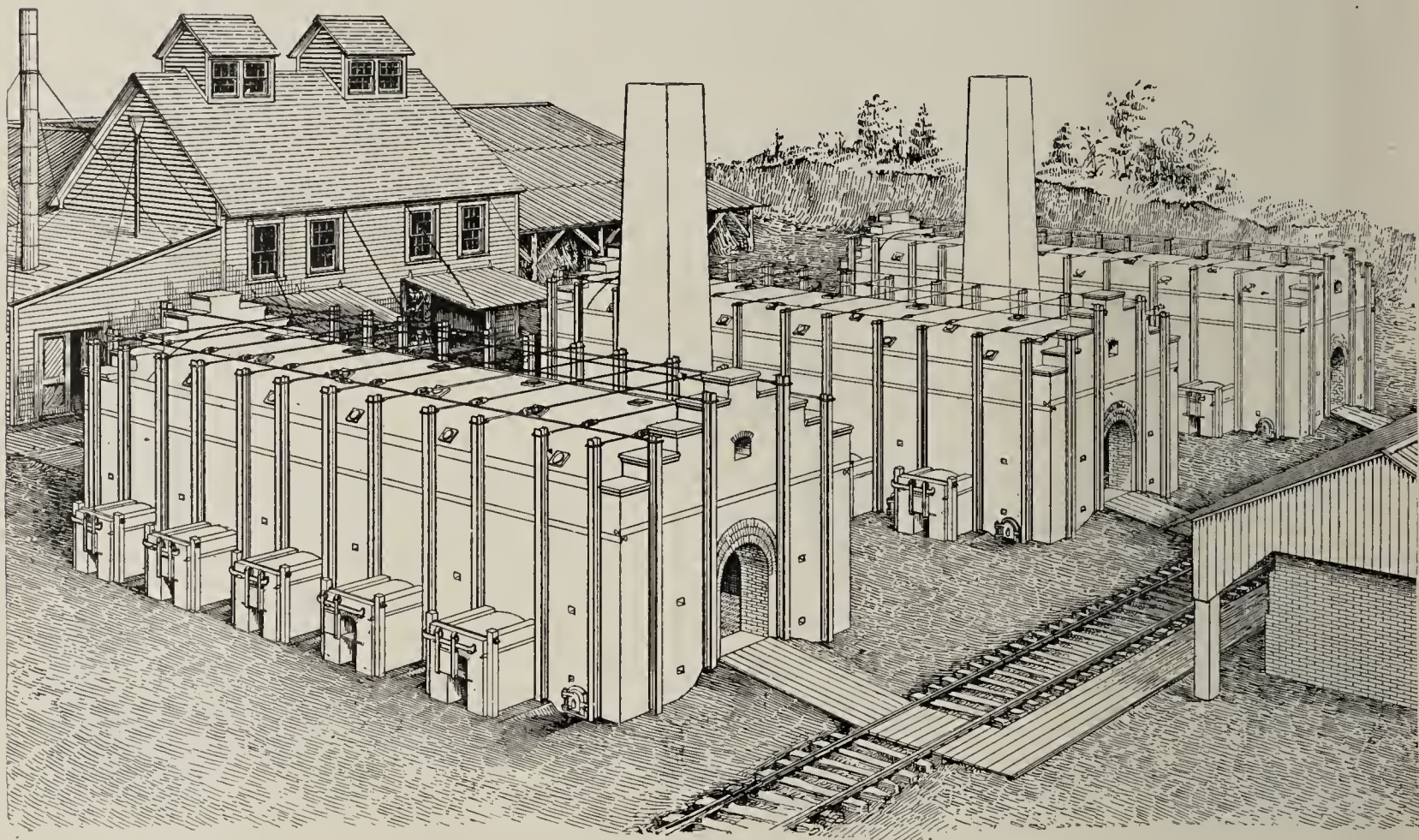
Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., = Saginaw, East Side, Mich.

A Modern Brick Plant

Brick Plants designed by us have the highest reputation for efficiency. They are modern, up-to-date, compact, convenient in arrangement, and not encumbered with unnecessary or useless machinery or appliances.

The Boyd Presses, Flood Up and Down Draft Kilns and Self-Contained Grinding Pans are money makers and money savers, first, last and all the time.



A SURE THING.—For Wise People.

We will construct and equip a Brick Plant of any capacity desired for any responsible party, furnishing Brick Presses, Power, Kilns, Clay-preparing Machinery, Shafting, Belts, etc., and erect the necessary Buildings. We will make and burn one or more kilns of brick, and turn the Plant over to him in proper working order under guarantee of satisfactory results as to quality of product and cost per 1,000; the loss to be ours in case of failure.

CHISHOLM, BOYD & WHITE CO.,

OFFICE AND WORKS:
57th and Wallace Streets.

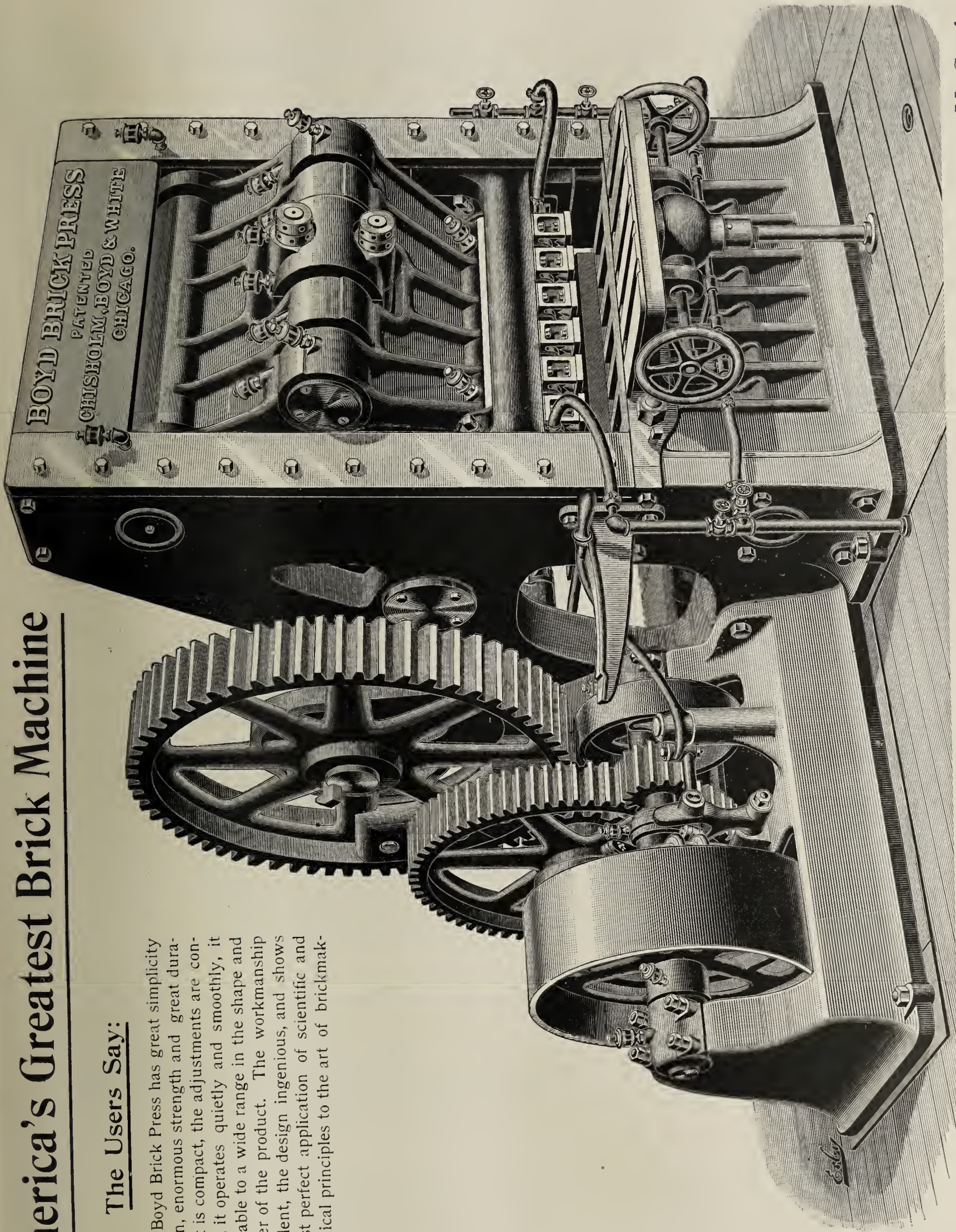
CABLE ADDRESS:
"CHISHOLM, CHICAGO,"
A. B. C. CODE USED.

CHICAGO, U. S. A.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. Code Used.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

Announcement.



THE splendid reputation established for our Brick Press has been due to a determination on our part to have a superior machine; one that would give the utmost satisfaction. How well we have accomplished this is shown by its record. This record and the many eulogiums passed upon it prove that it is the **Standard of the World.**

We are making a new dry press and other new machinery, and are starting a new and extensive machine works in Chicago, where we will manufacture a complete line of Clay Working Machinery of every description.

We thank our many friends for past favors and hope we may secure a continuance of their patronage.

Write us for catalogues and estimates.

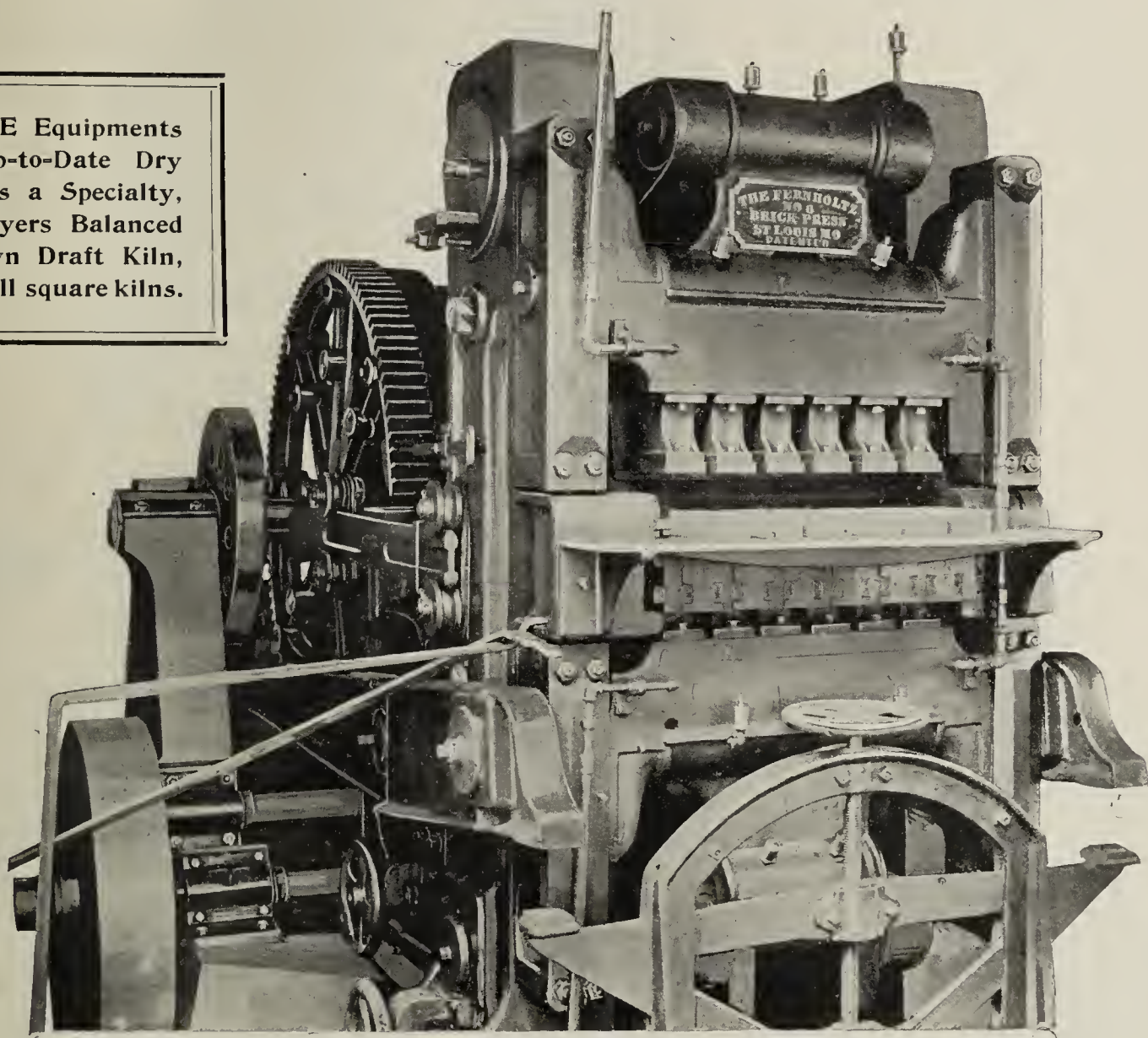
The Simpson Brick Press Co.,
CHICAGO, ILL.

Manufacturers and Contracting Engineers for every branch of Clay Industry.

The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMPLETE Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

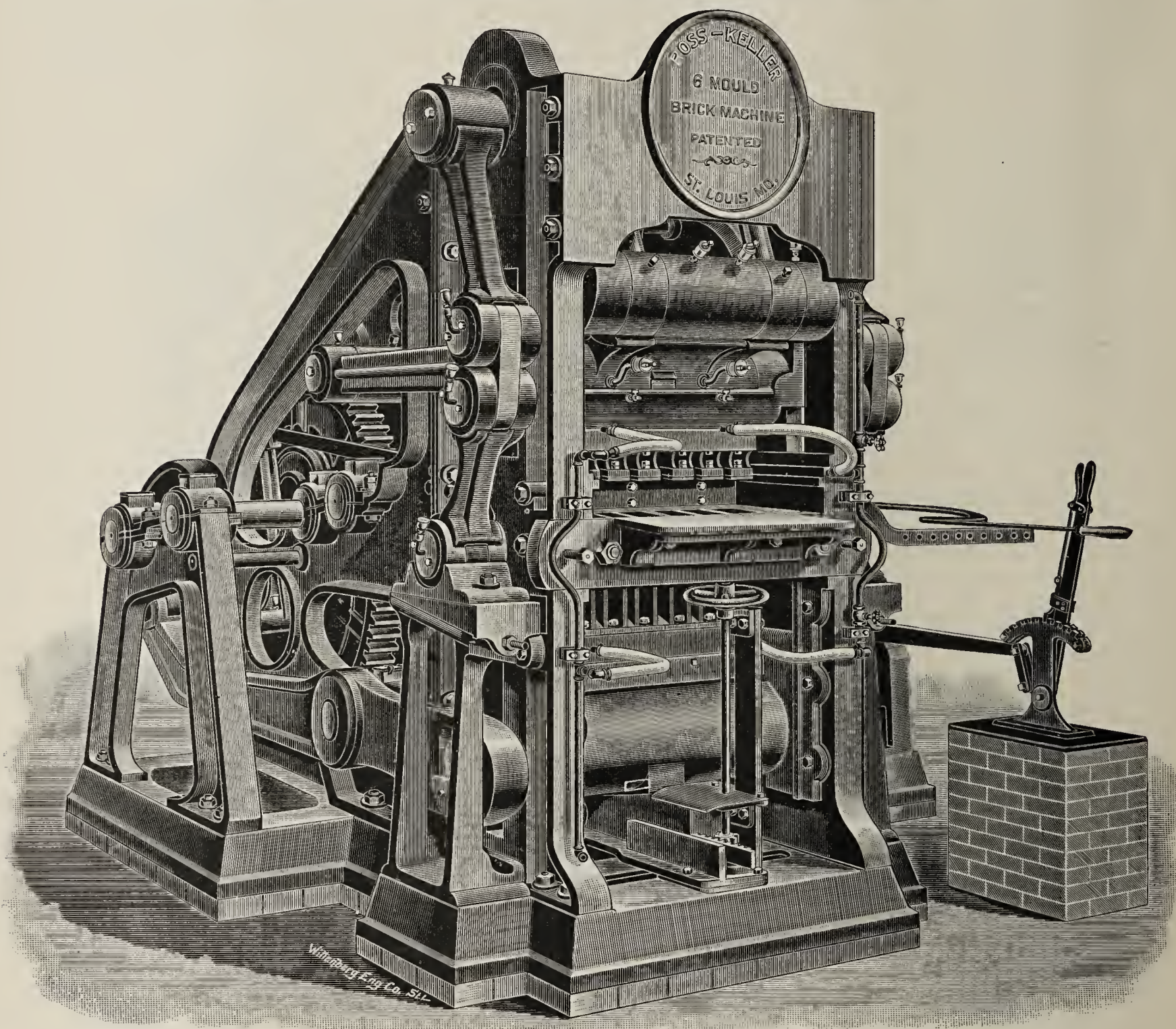
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

—ST. LOUIS, MO., U. S. A.

"A Clay Pulverizer of Wonderful Capacity."

SO SAY ALL WHO HAVE USED IT.

Wagoner, Ind. Ter., January 22, 1897.

MR. GEO. F. COTTRILL, Sec. Green's Carwheel Works, St. Louis:

Dear Sir--Yours of the 19th to hand, and in reply will say that we purchased, last June, of Milton F. Williams & Co., of your city, one of his Shale Crushers and Pulverizers, which we used for grinding shale for the manufacture of Press Brick. It has given us entire satisfaction. We ran it four months and did not pay out one cent for repairs.

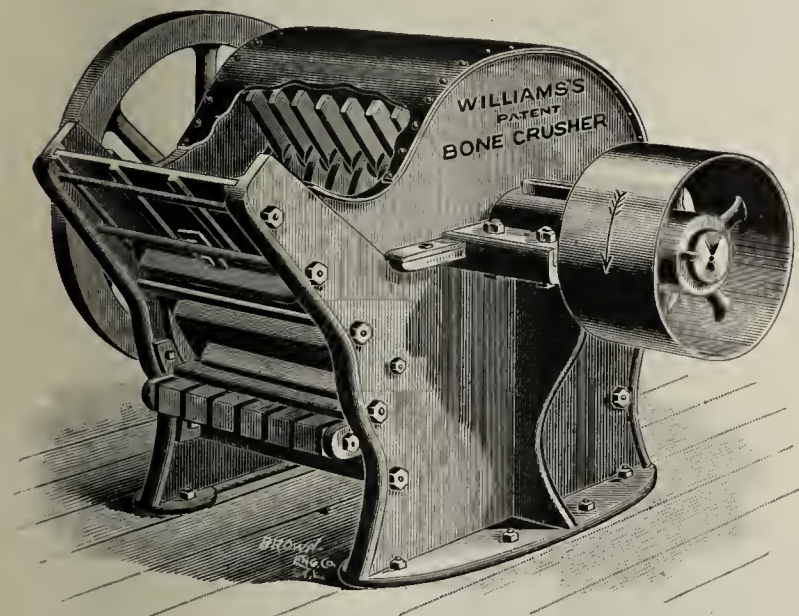
We think it the best machine on the market for pulverizing shale. This is all the experience we have had with it. It fully complies with the manufacturers' guarantee.

Respectfully,

TAYLOR & RAINES,
Per H. B. R.

We can send you many more like this.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER



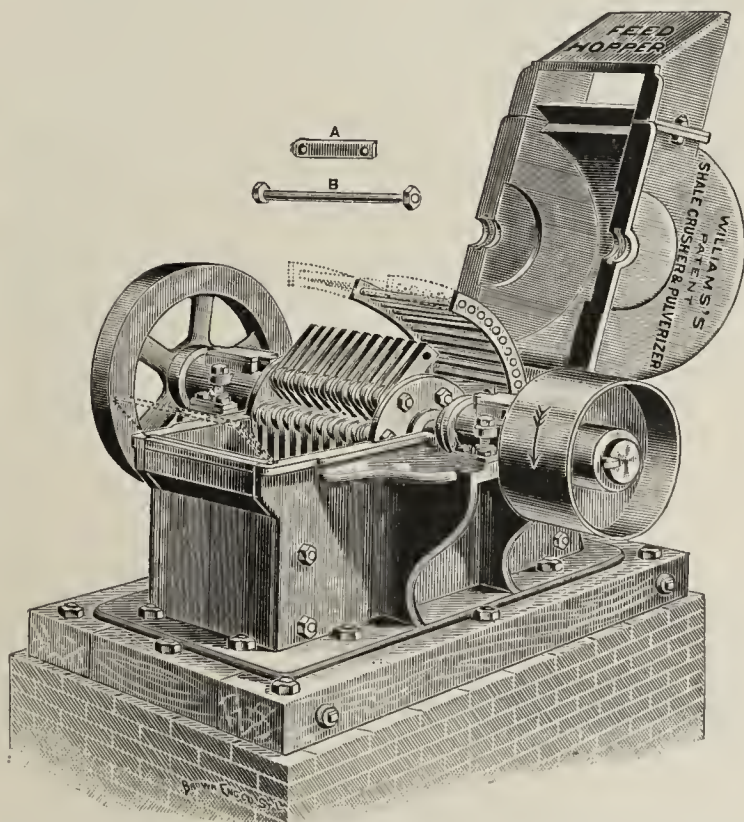
Williams's Shale Breaker.

THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

The Williams Patent Crusher and Pulverizer Co.

2705 North Broadway, - - St. Louis, Mo.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

Columbia Brick Press.

All working parts are made of Steel.

The pressure is exerted from both top and bottom; consequently there is no lateral strain on the machine.

The pressure is absolutely equal on top and bottom of brick.

A brick with granulation cannot be made on this machine.

The liners on mould can be taken out and replaced in five minutes, without removing any other part of the machine.

Any part of the gearing can be removed without taking machine apart.

The mould box can be taken out in a few minutes, without disturbing the other parts of machine.

The "COLUMBIA" presses clay or shale as dry as a hydraulic press, or so damp as to approximate a stiff mud brick, so that the range of products is from building brick to pavers. No other press does such a variety of work.

The "COLUMBIA" is the only brick press on the market that meets ALL the needs of a brick plant.

For circulars and prices, address

H. B. HILGEMAN,

General Agent "COLUMBIA Brick Press,
... and "COLUMBIA" Mould,

306 Oriel Building, ST. LOUIS, MO.

Terrazo Cement Tiles.

Complete Plants furnished for making the celebrated "TERRAZO" Tiles. Used to the exclusion of all other tiles in all floors, halls, etc., of the following among hundreds of structures in Germany:

JOHANNIS CHURCH, ROYAL AGRICULTURAL COURT, ROYAL DEPARTMENT OF THE INTERIOR, DRESDEN; GERMANIA PALACE, BERLIN AND ANHALT RAILROAD DEPOT, IMPERIAL ART AND MECHANICAL MUSEUM, ROYAL MILITARY ACADEMY, BERLIN; IMPERIAL POST OFFICES, DRESDEN, BERLIN AND
..... LEIPSIG.

Terrazo Tiles, any color, design or size. For circulars, estimates, etc. Address

H. B. HILGEMAN,

General Agent of THEO. WELGE, for the sale of Dr. BERNHARDI SOHN, G. E. DRAENERT, GERMANY, Machinery and Processes for making TERRAZO CEMENT TILES.

306 Oriel Building, ST. LOUIS, MO.

THE ANDRUS DOUBLE PRESSURE 4-Mold BRICK PRESS.

Produces the finest pressed brick from dry or semi-dry clay at less cost than common brick by any other process. This press is the **Simplest** and the **Strongest** press on the market, and has given **universal satisfaction** to purchasers. We guarantee it against breakage for **5 years**.

Send for descriptive catalogue.

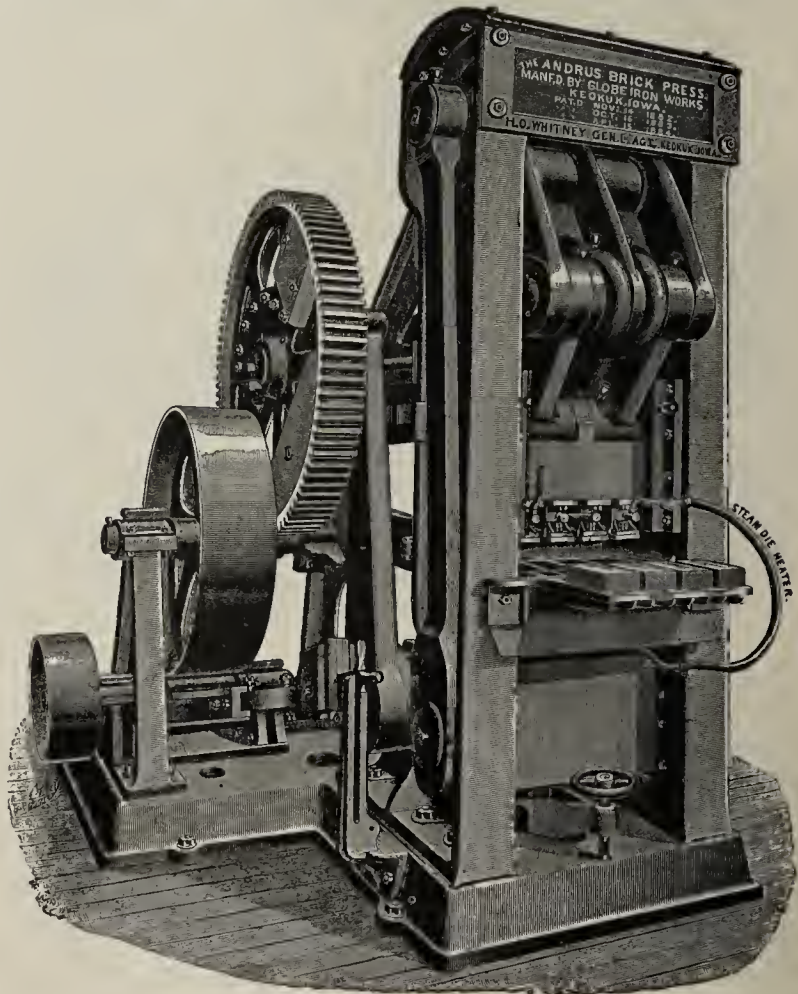
Address, _____

H. O. Whitney,

General Agent,

GEN. OFFICE AND
FACTORY.....
KEOKUK, IOWA.

KEOKUK, IOWA.



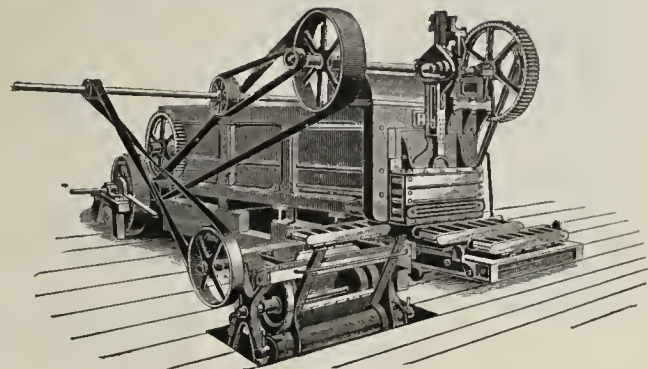
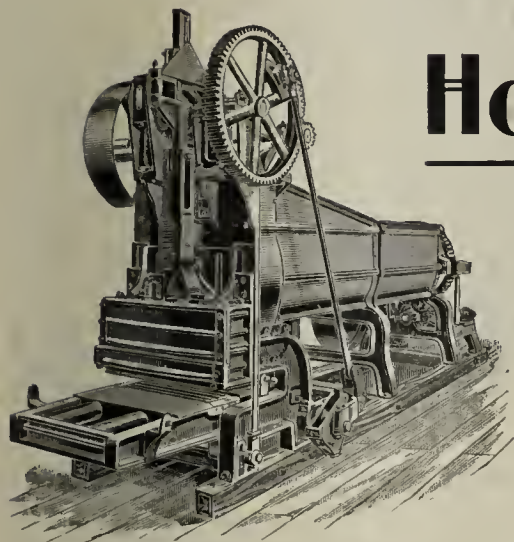
We Have Anything You Want.

.....

Horizontal

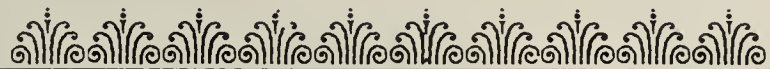
Stock

Brick Machines,



EITHER ALL IRON OR WOOD PUG MILLS.

The largest, heaviest and strongest Brick Machines made. We defy competitors to show as well and strongly built machinery. They have no equal for Quality and Quantity.

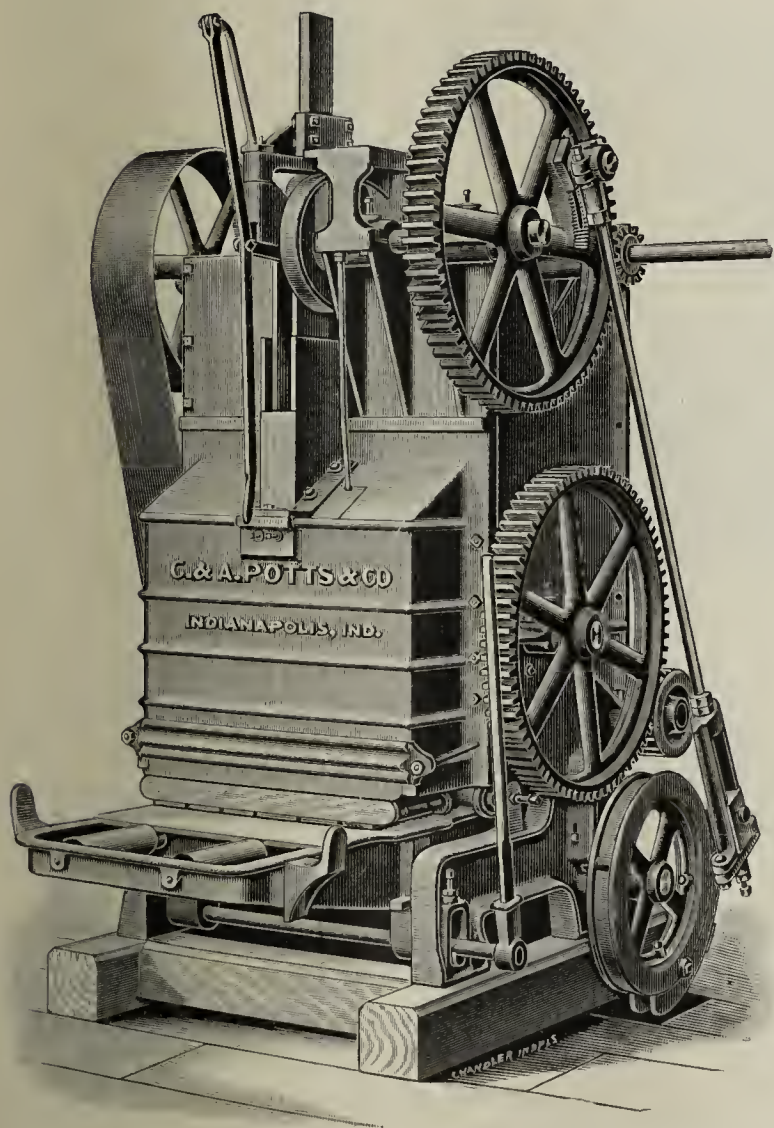
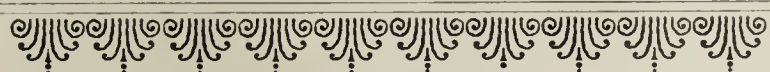


Our New ...

VERTICAL MACHINE

Is entirely different from all others of this class. The press is entirely inside of machine, it has no Vertical shaft is positive in filling the press box and moulds.

WE NEVER FOLLOW,
BUT ALWAYS LEAD.



Write for full Particulars to

G. & A. POTTS & CO., 420 W. Washington St. **INDIANAPOLIS, IND.**



BRICK DRIER

Or any article, for that matter, that has no quality other than its cheapness to recommend it, is a pretty good thing to leave alone.

The STANDARD IMPROVED BRICK AND TILE DRIER

does not belong to this class; it has real, genuine merit; it is appreciated for its intrinsic worth; it is acknowledged to be the criterion by which the excellence of all others is judged—hence the expression frequently heard, "Just as good as the STANDARD."

In buying anything, whether a Drier, a railroad or a mule, it is the part of wisdom to consider QUALITY and RESULTS, AS WELL AS PRICE.

On THIS, the TRUE basis of comparison, WE DEFY COMPETITION.

The testimonial letter given below is offered as evidence of the high esteem in which the STANDARD DRIER is held.



OFFICE OF THE SUMMERVILLE BRICK WORKS.

The Standard Dry Kiln Co., Indianapolis, Ind.

Summerville, S. C., December 8, 1896.

Gentlemen—It affords me great pleasure to have the privilege of testifying to the merits of your eight track Drier erected at my works in place of the ——— Drier, which was destroyed by fire last April.

In contracting with you for this Drier I was very particular in making you guarantee to dry 40,000 brick per twenty-four hours. After giving it six months' trial, I have concluded that you could have safely guaranteed 50,000.

Your Heating Apparatus I consider perfect. It is easily kept in order—in fact, I have done nothing to it since its installation. It does its work effectually, drying the output of my Chambers Machine, 40,000 per day, without being forced in the least. I cheerfully recommend your Drier to any one wanting the best and most economical one on the market.

Wishing you much success, I remain,

Very truly,

A. W. TAYLOR, Propr.

OUR NEW CATALOGUE No. 35

Contains a great many indorsements fully as emphatic as the above. A perusal of them will satisfy you, we believe, that every claim made for the STANDARD DRIER is verified by actual work. It also illustrates and describes our Equipment, including our new Steam-Saving Appliance, you will find it profitable reading. If we knew your address, we would send you a copy.

The Standard Dry Kiln Co., 186 South Meridian St.,
INDIANAPOLIS, IND.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVII.

INDIANAPOLIS, IND., APRIL, 1897.

No. 4.

Written for the CLAY-WORKER.

CHICAGO'S LATEST ARCHITECTURAL ACHIEVEMENT.

THE RECENTLY COMPLETED underground railway station of the Illinois Central is a very unique piece of Chicago architecture which is attracting no little attention. It is of particular interest to the readers of the Clay-Worker because of the extent and variety of the clay products which form a large part of its construction and adornment.

Briefly described, the depot itself, which is located on Van Buren street, at the edge of Lake Michigan, might be likened to an old-fashioned cave cellar buried in a hillside. This cellar, however, is lined with burned earth instead of raw earth, and cost some \$75,000, while the front, instead of being an old plank door, is a stone, glass, mahogany and iron facade over 200 feet long, looking toward the railway tracks and Lake Michigan, and the "hillside" is the Lake Front Park, which rises gently from Michigan avenue, just high enough to conceal from view the railway trains, which run between the avenue and the lake.

The problem was to provide accommodations for a large suburban business and keep the depot strictly below the surface of the park. The solution was successfully achieved, and hollow tile, brick (common, pressed and enameled), terra cotta (glazed and plain), ceramic, mosaic and tiling, were very important factors.

As may be seen by the accompanying illustrations, the front of the station has many doors, so that a crowd of people can quickly pass from the long waiting rooms to the train platform. A heavy retaining wall of stone incloses the other three sides of the station, excepting an entrance opposite the train side, which allows approach from Michigan avenue by a gradually descending walk between retaining walls.

Inside of the stone walls which inclose the depot proper is built a brick wall, with ventilated space between to keep out moisture. This wall is faced with enameled brick, tile and terra cotta. Hollow tile arches are used in both floor and ceiling construction. Under the former a good ventilated space prevents dampness, and above the latter concrete and asphalt support the superimposed earth and grass. The two waiting rooms, each 34 by 106 feet (9½-foot ceiling), and the various toilet, smoking rooms, ticket offices, etc., have but little wood in view and none at all concealed. The great object was to attain durability and elegance, and at the same time make the work proof against both fire and water.

As one descends the approach from Michigan avenue (see photograph) the first thing that catches the eye is the sign on the bridge connecting the two parts of the park. This sign is a part of the terra cotta covering of the steel girders, the face of the letters being a white enamel.

The two arches forming the entrance to the station proper are of stone. Beyond these can be seen a wall, which is faced with American enameled brick. The window sills and lintels are blue enameled terra cotta. Standing in this entrance loggia, one can see a frieze of white enameled terra cotta, finishing the top of the white enameled brick walls and forming a covering for the ceiling beams. A critical eye here notices the inevitable unequal shrinkage of two pieces of terra cotta covering the soffit of a beam sixteen to eighteen inches wide trying to carry moldings in perfect

alignment; and it makes him wonder if the designer wasn't a sinner, with many sympathizers, who all, at one time or another, refused to let the terra cotta man joint his material in such a way that he would have some "come and go" in the fitting to correct the unequal shrinkage.

Passing further into this entrance loggia, we have a view



TERRA COTTA NEWEL. Executed by the American Terra Cotta and Ceramic Co.

of the large terra cotta newel at the foot of the stair which leads to the park level (see photograph). This newel is a single piece of white enameled terra cotta weighing seven or eight hundred pounds. If that came from the kiln at the first trial it is marvelous, for it is almost perfect. One can detect a slight crazing at one place, and some "runs" of the enamel at another, but the artistic success would not be complete without those points of interest.

As the visitor enters the depot proper he steps from cement to ceramic mosaic, and then (in the large waiting rooms) to a fine tile floor. The walls are covered with cream glazed English tile, with edge grooved backs to prevent loosening, a result to be feared from train vibrations. The ceilings are plaster, executed in Gothic paneling. The white ceilings, cream tile walls, red and white tile floors and the mahogany doors and settees combine to make a very light and pleasing effect.

In addition to the terra cotta work already mentioned, there are some ornamental brackets of elaborate design. But the most important part remains, namely, the columns. The photograph can scarcely do these justice. The cast-iron columns are covered with terra cotta having a glassy glaze over a slip of a decided yellow. A terra cotta man would look closely to find the reason why this glaze appears to be perfectly transparent in general, but in places appears almost an opaque white. One will observe that some of the blocks are considerably lighter in color than others, but the general effect is fine. In fitting the

terra cotta to the iron columns close work had to be provided for. The cellular backs were cut in such a way that just before setting the webs could be knocked out, so that between the hollows of moldings and the metal there is scarcely three-quarters of an inch.

With so much terra cotta on the interior of this building, one feels regret that the exterior is not more generally of the same material instead of stone.

Some important outside work remains, however, to be mentioned. The viaduct over the tracks connecting the park with the water's edge has its steel members covered with terra cotta and glazed hollow tile as a protection against the atmosphere and the gases from the locomotives. Several similar viaducts at some distance from this depot are treated in the same way. The side girders and columns and those next the station are covered with terra cotta, while the others are covered with hollow tile with a glazed surface. The exterior terra cotta is of a mottled gray-brown, which looks well and matches the stonework.

Altogether, this curious, but most convenient and practical, railway station reflects great credit, not only on Mr. J. F. Wallace, chief engineer, and Architect Francis T. Bacon, but, as well, on the contractors and manufacturers concerned, and particularly on the American Terra Cotta and Ceramic Company, from whose kilns came all of the glazed terra cotta. In this structure our good friend, W. D. Gates, President of that company, has a lasting monument.

FULCRUM.



A GLIMPSE OF THE VIADUCT AND TRAIN ENTRANCE TO STATION.

Written for the CLAY-WORKER.

BRICK VS. STEEL CONSTRUCTION.

BY R. "BRICK" MORRISON.



WHAT IS KNOWN as steel construction has become popular during the past few years. These buildings are composed almost entirely of steel. The frame joists and girders are of steel; floors are formed of clay between the joists or "I" beams, these being protected by a covering of clay to protect them from heat in case of fire. The outside wall is usually composed of a four-inch veneer of brick, ornamented with terra cotta. The brick veneering is supported by the steel frame and anchored to it. These buildings seem to be strong, durable, and are supposed to be fire-proof, both externally and internally. So far as my knowledge extends these steel buildings have never been subjected to a severe test of fire, and until they are thus tested these fire-proof qualities are only presumptive.

If a room in one of these buildings, filled with inflammable material, was to take fire, subjecting the walls and joists to heat sufficient to expand the steel, the whole structure would be affected, as the joists and girders would move by expansion in every part. The thin covering of burned clay would not long shield the steel from the intense heat. This expan-

sion would soon damage the building, and if subjected to this heat long enough would completely wreck the structure, or if the building was exposed to a high heat from without, caused by the burning of an adjoining structure, the frame would warp and twist, and the whole bulge from expansion so as to ruin the value of the building. Every part of the building depends upon the steel frame, and when it becomes affected by heat the entire structure will be involved. When a portion or section of steel is heated, the movement caused by expansion is imparted to the entire length and width of that floor.

Let us compare this with brick construction. A wall of brick, from two to four feet in thickness at the ground and a lesser thickness at the top, with partition walls of same material; iron joists or beams can be used, with clay floors, as in the steel building, with this difference: the joists are just long enough to rest on the walls on either side of the room, and need not be fastened to those used for the adjoining room, hence a fire in one room will not affect anything except the joists over that room. The walls, being of brick, will stand intense heat with comparatively little expansion. A building of this kind is like a ship composed of a series of water-tight compartments; if an opening is made in the side of the ship only a section is involved, the rest being independent and water-tight. A building of this kind is composed of fire-proof compartments; if fire breaks out in one room it is confined to that room. The effect is not felt in any other part of the building.

A building all of brick—that is, the outer and partition walls,



ONE OF THE MAIN WAITING ROOMS WITH TERRA COTTA COLUMNS.

with doors and windows set deep in the walls, strong, massive, durable, not only in appearance, but in fact—will, I believe, withstand fire and the forces of nature and remain intact when the steel building has become useless. This building can be ornamented with stone, marble or terra cotta, the same as can the steel building. As a brick manufacturer, I cannot see where our interests are advanced by defending steel construction or discussing whether the winding sheet of clay about the steel ribs can impart to them fire-proof qualities, which they confessedly lack when unadorned by this skin of clay. It becomes a wolf in sheep's clothing. The brickmaker gets a few pitiful thousands of brick in the building; these are wrapped around the grinning skeleton to hide its true character and give it a respectable appearance and one of solidity. There is nothing in steel construction for the brickmaker.

What care we whether it is possible to make steel buildings good, fire-proof and durable by folding them up tenderly in clay? If they cannot stand on their own merits, and must be hidden behind good burned clay to protect them from fire and

GERMAN NOTES.

THE ANNUAL CONVENTION of the German Association of Brick, Clay Ware, Lime and Cement Manufacturers was held at Berlin Feb. 22, 23 and 24. Several interesting papers were read, and the subjects brought before the Association were discussed in a lively manner. The society has 549 members, and, according to the Treasurer's report, it is in a flourishing condition financially, having \$3,300 on hand.

Among others, Mr. Schneider spoke on the prevention of boiler scale. He cautioned his hearers against the use of the advertised boiler compounds, and he thinks that the injurious ingredients should be precipitated chemically. Soda, he claims, is an excellent reagent for this purpose. It should be added to the water till the latter reacts alkaline with litmus paper. But in case of extremely hard water soda cannot be used successfully. Of course, the soda is to be introduced gradually. The boiler should be blown off daily, lowering the water level at least two inches. The best way is to precipitate the scale-



APPROACH TO MAIN ENTRANCE TO UNDERGROUND STATION. See page 329.

frost, let them go out of fashion. The sooner the better for all brickmakers. Let us waste no time in defending steel construction. Bricks have the history of forty centuries to testify to their unequalled fire-proof qualities and their matchless durability. I believe time will demonstrate the truth of my position on this important question.

GOLD BRICK.

The story goes, says a Western exchange, that a certain manufacturing company in Utah has discovered that the clay out of which they make bricks carries gold in paying quantities. It may or may not be true, but it is true that in all the gold mining regions of the West the clays and sands, nearly all, and perhaps all, carry small quantities of gold. Particles coarse enough to be seen with the unaided eye have been found in Denver made brick, and there is probably enough in them all to electroplate with gold the outside of every brick house in the city. But this is far from being enough to pay.

forming matter before the water enters the boiler; that is, in a heater or similar apparatus.

Mr. Olschewsky discussed his new system of drying with chloride of lime. Extremely tender clays can be dried by this system without the least danger. The chloride of lime absorbs the moisture from the ware, and from a solid it is converted into a liquid, which is again restored to the solid condition by heating. A charge of ten tons of the lime costs about \$150 to \$200.

Mr. Dannenberg spoke about his continuous kiln, which is fired from stair-like grates arranged along the chambers and fired from the top, as usual. The burning in this kiln proceeds in the ordinary manner, excepting that the fuel does not come in direct contact with the ware. He recommends this arrangement for burning all the better grades of ware, but acknowledges that good coal must be used, not one of a clinkering nature nor one containing too much ash. Poor coal obstructs the grates, which cannot be cleaned sufficiently during the burning.

—Making Brick Cheap.—

Mr. Bock described a hand yard near Berlin, a concern

having a capacity of 80,000,000 brick per year, and which makes the brick at a selling price of \$2.85 per thousand. The clay has to be hauled nearly four miles. The molding is done on top of the large continuous kiln, and the brick are dried there on movable pallet racks. The dry brick are taken into the chambers by means of a smooth iron trough, through which they are slid down to the setting gang. The rate of making a thousand brick has been cut down to 95 cents; fuel for burning costs 37 cents; fuel for running pug mills, 5 cents per thousand, so that the brick can be delivered into Berlin for \$2.60.

A number of other subjects were discussed, but we find that the trade journal reports make only brief mention of them. In the course of the transactions Dr. Hecht proposed that a map of Germany, three feet square, be made, showing all the brick establishments according to their size. The sum of \$250 was appropriated for the preliminary work required by this undertaking.

The question whether to extend or to narrow down the theoretical instruction at the Brickmakers' School was debated, and the prevailing feeling seemed to be that more stress should be put upon the theoretical instruction, the application of which must be learned in actual practice.

Written for the CLAY-WORKER.

"CHEMICAL RECIPES."

SUCH IS THE TITLE of a book published this year by the Atlas Chemical Company, of Sunderland, England, and advertised somewhat extensively in the trade press of this country.

It is a compilation of recipes divided into two parts, the first treating of ceramic preparations, such as bodies, glazes, colors, enamels for metals and clay wares, etc., and the second treating of a large variety of materials which find daily use in the workshop and home. Included among the latter are paints, driers, varnishes, stains, lacquers, inks, dyes, soaps, oils, greases, etc.

Of the latter half of the book I shall say but little, because I do not claim to have expert knowledge in any of these various subjects. Assuming, however, that they are all good and useful recipes, it still may be worth while to call in question the advantages or benefits of this method of conveying information to the public. I find in the preface no adequate statement of the exact aims of the book, but gather from bits of text which introduce some of the more important subjects considered that the author or authors (as it is possible, and even likely, that different men compiled the different portions of the book) had in mind the presentation of the largest quantity of practical information in the most concrete form possible, and with the use of the simplest and best known terms, so that mechanics and artisans possessing but little education and no scientific training could understand and appreciate the book.

Such objects, if I have correctly apprehended them, are certainly laudable, but the question still arises whether the method chosen is the best way of accomplishing these objects. I do not believe that it is. It holds good at the bench of the carpenter, or the forge of the blacksmith, or the shop of the painter, just as much as at the desk of the merchant or the laboratory of the scientist, that to do good work or to be in any way worthy of the title of a good workman, one must understand that which he tries to do. It is not sufficient to know how to do it. You must know why and wherefore, also, or you are still a novice in your line, whatever it is.

For this reason, books like the one under consideration, which make no systematic attempt to explain reasons, but merely give a great mass of proportions and mixtures, have always seemed to me to be very immature and bunglesome ways of helping mankind forward. Their logical product, if they have any, would be a slave of thumb rule—a man who might know how a great many things should be done, but who would be incapable of applying his knowledge to any new problems which

might come his way. That is the tendency of modern trade methods in any case; machinery is constantly calling for skilled operatives who do one thing only, and do it better than any one else; but this process is stunting and degrading to the mental growth of the operative, and the old-fashioned trades people, who know not only how to execute, but also how to plan work, are constantly growing less common, and it seems to me to be the duty of education to fight this benumbing influence in every way.

For this reason, though I do not attempt to criticise the matter of Section 2 of this book, I do protest against its omissions. To be useful in the way that such a book ought to be useful at least one-third, and possibly two-thirds, of the book ought to be devoted to the explanation, in the simplest and plainest terms if you will, of the principles of the work described, and, above all, the recipes should be grouped in a systematic manner, according to the classification described in the text.

In other words, I would advise any one who wished to learn about this line of subjects to buy a text-book of chemical technology. In such books you get both theory and practice, writ-



J. F. WALLACE, Chief Engineer Illinois Central Ry., Chicago.
See page 329.

ten by men who are experts in both, who do not give place to matter which is technically incorrect, or doubtful at best.

Touching Section 1, which is the field to which the readers of the Clay-Worker will turn with most eager interest, I can say that all of the foregoing remarks apply with added emphasis. One curious thing, which may have a perfectly innocent explanation, but which does not look altogether right on the surface, lies in the fact that from pages 6 to 110 and 119 to 122 the text and recipes are almost identical with those which form the entire subject matter published in a little hand book of recipes by W. R. Creyke, of "The Colour Works," Hanley, England, in 1889.

There are eight or ten pages of matter in the first section of the Atlas book which are not in my copy of Creyke's second edition. But in a book like this, published by a "chemical" company, one would expect that chemical errors and gross misstatements would have been weeded out by the experts whom the company employed to edit their volume. But every little

absurdity of Creyke's book, of which there are not a few, are faithfully copied in the Atlas version.

For instance, on page 7 of the former, under "Preparation of Silver," Creyke directs one to prepare silver nitrate, next to precipitate the metallic silver by a plate of metallic copper, and then wash the spongy silver to remove the "acetate of copper." This the Atlas people have reproduced on page 6 of their book, except that they spell acetate correctly. But any one can see at a glance that no acetate of copper is formed in this process; the nitrate is the only salt produced.

Again, aqua regia is given on page 6 as two parts nitric acid and one muriatic acid. It would probably be inferred from this by the workman who used it that there was no other proper proportion. But aqua regia is a liquid of no fixed composition, and whenever muriatic acid and nitric acid are put together in any proportion aqua regia exists till one or the other acid overbalances and destroys the other. This is a little thing, however.

More seriously wrong is the advice given on page 86, where "raw glaze" formulae are given. These formulae contain borax and boracic acid, both of which are soluble in water. Not only is it very wasteful to use them in this way, as a large part of them are lost by pouring off the excess of water used in grinding, but also the little that is left is the cause of active trouble to the potter. It has a tendency to soak into the porous biscuit body and to produce a degree of vitrification which is irregular, and therefore cannot be accurately gauged in the firing, and which is almost certain to cause crazing by varying the co-efficient of expansion of the wares through greater or less vitrification.

Similarly, on pages 90, 93 and 100, are formulae given for glazes in which barytes and plaster are ingredients. The use of these, or any other sulphates, in glazes of this type is most objectionable. In fact, sulphates are to the glazemaker as troublesome as phosphorus is to the steelmaker, and to deliberately put sulphates into a glaze of the types in question is simple folly. Not that glazes cannot be made of these ingredients; they can be, and are, but with their use come scummy, greasy-looking glazes, often with crystalline segregations in them, and, if overheated, a multitude of blisters and pinholes. To get glazes free from sulphates is an important thing in careful potting, and the materials used, even to the coal burned in the kilns, are carefully watched to keep out these troublesome ingredients.

Another amusing recipe is given on page 107, being that of a so-called "blood-red stain" for coloring clays which are too pale red to suit the taste of the manufacturer. The recipe in question calls for crocus martis, red oxide of iron, sulphate of iron and ochre, all four of which are either composed of oxide of iron or will furnish oxide of iron by burning, or owe what coloring power they possess wholly to the oxide of iron which they contain. Why did he not say to take as much red oxide of iron as he needed to do the requisite coloring, and let it go at that?

But the worst error, or rather the greatest exposure of ignorance, is in that part of the book which is not taken from Mr. Creyke's data. This occurs in a little discussion on pages 124, 125 and 126, with which the editor winds up the section on ceramic recipes. Discussing the subject of "crazing," he remarks that he has for years, with "more or less success," experimented to find out "some chemical production to arrest the unsightly defect of crazing." And he concludes that the most successful methods are those given below, in the following order:

1. Flux made of ten parts tincal (crude borax), four parts oxide of zinc, one part of soda.
2. A calcination of five parts of oxide of zinc and one part of pearl ash.
3. Addition of raw oxide of zinc, six pounds to each one hundred of glaze.

Truly, well may he say "with more or less success." Is it not pathetic to see a man, who, by his own assertion, has spent

years of experimenting in the ceramic industries, trying to find a "cure-all" for the defect of crazing? The philosophers of several centuries ago spent some little time in looking for a process of making gold out of common materials, likewise for an "elixir of life" (not Brown-Sequard's), but history does not record that they made any great headway along these lines.

But we of this day and generation know well that crazing is a strictly physical phenomenon, due to a condition of strain between body and glaze, which do not expand and contract at the same rate; and we know that each case must be doctored on its own merits by altering the contraction of one or the other of the two substances till both are in harmony. The idea of any "cure-all" is absolutely childish, for it is plain that if any cure were applied to a glaze which was too acid, and thus cured the crazing, the same cure would surely fail when applied to some other glaze which was too basic.

Would it not have paid this "expert" to have devoted a few years, two or three at least, to learning about the principles and laws of his life work before he began his experimenting? He might have produced something by this time which would have helped to lift his industry up, instead of prolonging its period of incubation.

In conclusion, let me say that it does not seem to me that the Atlas Chemical Company have brought much credit to themselves (or to the English-speaking peoples of the earth) as chemists or technologists by the publication of this book. They discuss on page 5 the reputation of English manufacturers as being inferior to the French or German in these lines of chemical technology. And it seems to me their book is in itself a most luminous explanation of this fact. While the English, and, to a large extent, we on this side of the Atlantic, have been trying to run our factories on the "rule-of-thumb" plan, the Germans have seen that pre-eminence in the industries means scientific training for its operatives and owners, and they have attacked the problem on these lines, and are now in the lead. Can we not take this pointer now, without allowing them to increase their advantage over us? E. ORTON, Jr.

BIG VALUE IN CLAY.

An interesting, though lengthy, article on the diamond fields of South Africa, now going the rounds of the daily press, concludes as follows:

The blue clay which contains the diamonds of Kimberley, in South Africa, is brought from deep mines to the surface of the ground and spread out so as to expose it to the influence of the sun and moisture. Thus treated, it soon crumbles, so that at the end of three months it may be put into great washing machines, in which, by means of running water, the gems are separated from the blue stuff. Then the residue is placed in large gobs on tables, where it is sorted with small trowels. The diamonds occur in all shades, from deep yellow to blue white, and in a great variety of greens, blues and pinks. They vary in size from a pin's head upward. Next the diamonds are cleaned by boiling them in acids, after which they are carefully sorted as to size, color and purity. On an average, one hundred tons of blue clay will yield one hundred carats of diamonds. The diamonds are sold in parcels to local buyers, who represent the leading diamond merchants of Europe. In one instance nearly a quarter of a million of carats were sold in one lot to a single purchaser. The company sustains a loss of from 10 to 15 per cent. of its production by stealing, it is reckoned. The native workmen are engaged for a period of three months, during which time they are confined in a compound surrounded by a high wall. On returning from each day's work they are obliged to strip off all their clothes. Stark naked, they proceed to the searching room, where their mouths, their hair, their toes—in fact, every part of their bodies—are subjected to an elaborate examination. The precautions taken a few days before the natives leave the compound, to recover diamonds which they may have swallowed, are more easily imagined than described.

Written for the CLAY-WORKER.

CERAMIC ILLUSTRATIONS OF OLD PHILADELPHIA BUILDINGS.

BY EDWIN ATLEE BARBER.

The First Bank of the United States and the Hamilton Mansion—Gilpin's Famous Mills on the Brandywine—Views in Fairmount Park—The Earliest Steamboats.—

THE DARK BLUE DESIGN of the United States Bank which was printed on dinner plates early in the present century is of great historical interest. The ceramic engraving was copied from the original print, drawn, engraved on copper and published by W. Birch & Son, Philadelphia, in 1799, a copy of which had been sent to England to Joseph Stubbs, potter, of Burslem. The accompanying cut shows the Birch engraving from which the Stubbs design was made, and a comparison of this with one of the blue plates, of which numerous examples still survive, will reveal the same view of the bank, which, by the way, is still standing in Third street, below Chestnut street, Philadelphia, in the same condition, externally, as it was a hundred years ago, but the adjacent buildings have been replaced by more modern structures. The Bank of the United States was incorporated by Congress in the year 1791, and the bank building was finished in 1795. In the pediment over the portico may be seen the original sculptures of the American eagle and cornucopia of plenty, while below is inscribed the date of its founding. On March 4, 1811, the charter of the bank expired, and the building was afterward used as a banking house by Stephen Girard.

The second Bank of the United States was chartered by Con-



BANK OF THE UNITED STATES, IN THIRD STREET, PHILADELPHIA. From an Engraving by W. Birch & Son, 1799.

gress in 1816 for a period of twenty years. In 1818 the old Norris mansion, on Chestnut street, between Fourth and Fifth streets, was purchased by the bank. The new building was commenced on this ground in 1819 and completed in 1824. President Jackson's attack upon the bank caused the government deposits to be withdrawn from it in 1833, and in 1836 its charter expired. The property was purchased by the government in 1845 for the purpose of a custom house, and the building is still used as such. No view of this second United States Bank structure seems to have been used in the decoration of china.

The view of "Woodlands near Philadelphia" belongs to the same table service as the design just described. This is one of the prettiest landscapes which appeared on old-time pottery, and it possesses special interest because the original structure is yet standing in West Philadelphia, in the center of the extensive cemetery of the same name. William Hamilton, the owner, was a wealthy patron of the arts, and his library contained numerous family portraits by the best American and English artists, besides a valuable collection of paintings of the Dutch, Flemish and Italian schools, a rare thing in those days. On the east side of the building was a large bow window, two



THE HAMILTON MANSION. "Woodlands near Philadelphia."

stories in height (hidden by the spruce tree on the right of the print), into which the dining room opened, and the corridors and adjoining apartments were high-ceiled and spacious. The grounds, now filled with mausoleums and monuments, were, during the early part of the present century, beautifully laid out in drives and walks, and contained many rare plants from foreign parts. There were few country seats which could surpass the Hamilton mansion in the elegance of its appointments and the beauty of its surroundings when at the height of its glory.

Among the ceramic views of early American enterprises is that of the "Gilpin's Mills on the Brandywine Creek," in the deepest, darkest blue color, which is of considerable historical importance. This print has been usually classed by collectors among Pennsylvania subjects for the reason that the greater portion of the Brandywine lies in that State. By some ceramic writers these mills have been located on the site of the battle of the Brandywine, but each of these suppositions is incorrect. Gilpin's mills are situated at Kentmere, in the State of Delaware, a short distance above the city of Wilmington, near where the Brandywine joins the Delaware river, and the scene of the memorable battle where General Lafayette was wounded, which was fought on the 11th of September, 1777, lies a dozen miles or so to the northward.

As early as 1787 these mills were operated by Thomas and Joshua Gilpin, who were the first in this country to introduce revolving cylinders for the manufacture of endless paper. Their improvements in machinery revolutionized the methods of paper-making in this country, hence the Gilpin mills became widely known. The original owners are said to have operated them for half a century, during which time they expended about \$350,000 in construction and improvements. During this period a large quantity of banknote paper was manufactured here for the United States government. The view on the plate repre-

sents the tall twin structures of the original establishment, with their adjoining buildings, on the bank of the historic Brandywine. The mills were afterwards enlarged and remodeled, and Kentmere, the old red mansion erected by Joshua Gilpin, is still standing.

Fairmount Park, Philadelphia, has furnished subjects for more than half a dozen of the best ceramic views in blue. We find at least four different representations of Fairmount water works; the "Race bridge," often erroneously called the "Race-



GILPIN'S MILLS ON THE BRANDYWINE CREEK, Delaware.

street" bridge, which was a small foot bridge spanning the race which extended back from the Schuylkill river, near the water works proper. Then there is the view of the "Upper Ferry bridge," extending over the same river a short distance above; a representation of "Fair Mount, near Philadelphia;" "Mendenhall Ferry," with its rope cable and flat-bottomed scow, which was used early in the present century for transporting passengers and live stock from one bank of the stream to the other, and two varieties of the "Dam and Water Works," in one of which is shown a river steamboat in the foreground, with double stern wheel, and in the other a schooner-rigged steamer, with side paddle wheels. A pitcher bearing the latter design shows the dam and falls, with boat in the foreground loaded with passengers, while on the rising ground in the distance is "Lemon Hill" mansion (still standing), the former country seat of Henry Pratt, at one time a prominent and wealthy Philadelphia merchant, and to the right of the dwelling may be seen the greenhouses and flower beds, once widely known as Pratt's gardens, which, three-quarters of a century ago, were the pride of Philadelphians. Around the opposite side of the pitcher extends the River Schuylkill, with the buildings of the water works rising from its eastern bank. As the dam was not completed until 1822, this ceramic view probably appeared some time between 1825 and 1830.

The first American steamboat was built by John Fitch in 1788, and in the same year it made a successful trip on the Delaware river, between Philadelphia and Trenton, reaching a speed of eight miles an hour. But the many difficulties with which the inventor contended caused him to abandon his experiments, and it was not until Robert Fulton had completed the Clermont, which first made a trip up the Hudson, from New York to Albany, in 1807, that the practicability of navigation by steam was successfully demonstrated. Afterward was fulfilled the prediction of Fitch, found in the manuscript he left, describing his difficulties and disappointments: "The day will come when some more powerful man will get fame and riches from

my invention; but nobody will believe that poor John Fitch can do anything worthy of attention."

The boat shown on the pitcher illustrates the improvements which were made in steam navigation within forty years after Fitch's first crude invention appeared and some twenty years after the trial trip of Fulton's steamboat.

Written for the CLAY-WORKER.

THE MARKET QUESTION IN BRICKMAKING—WILL CHEAP BRICK INCREASE THE DEMAND?

BY J. W. CRARY, SR.

"TRADE AND PRICE is regulated by supply and demand" is perhaps one of the oldest maxims known in the business of the world, and it has always been good and reliable until within the last thirty years, since which it has been too weak to stand the ingenuity and avarice of man, and especially the "Yankee man." Syndies have been known for centuries, but "trusts" and "combines," as we now have them, are of recent origin, and have come to be a power for good or evil as great, or greater, than civil Government. The trust and combine together have well-nigh destroyed the axiom that "supply and demand regulate trade." They destroy all legitimate trade, and regulate nothing but their own interest as they see it. Within the last few years brickmakers in several places have combined in order to keep up the price of brick. They have failed in their object. Old brickmakers would go on and keep up their "output," and even increase it, assuming that consumers would have to buy brick of the syndie or combine and pay the price fixed. It was found that the supply soon exceeded the demand. The brickmakers quit the combine, every one for himself, and, needing money, put brick at low figures, thinking that would induce a ready demand. But the low price failed to stimulate the demand, and so it was



PITCHER SHOWING DAM AT FAIRMOUNT, PHILADELPHIA, WITH PRATT'S GARDENS.

that oversupply and low prices could not influence or increase demand, nor could high prices check demand under normal and legitimate conditions of the market.

—No Rules Can Be Fixed to Uniformly Regulate Supply and Demand.—

The natural fluctuations of trade and business make it im-

possible to establish prices or demand for anything that is produced by the art or actions of men. There is only one general rule or line of policy that can safely be pursued with profit by individuals, communities or governments, in any of the pursuits or industries of life, and that is to avoid overproduction or excess in anything. If all the brickmakers will have it understood, and, by common consent, curtail their product of brick to suit the market, prices will become steady, reliable and profitable. But greed and avarice tend all the time in the opposite direction. The brickmaker has his plant fixed to make a certain quantity of brick. It is the capacity of his plant he looks to instead of the market. If brick falls 20 per cent. in price he is more inclined to maintain his output, or even increase it, than he is to curtail it. He will try to economize in cost by cutting the price of labor and raw materials, or else by increasing the day's work. He thinks anything is better than to "shut down" or decrease the output.

It is said that no common agreement to fix prices or output can be made reliable. This is true, and from that very fact every brickmaker or producer of any marketable product should act on common sense, honest business principles.

—All Brickmakers Should Be Well Posted in Business.—

A man that has sense enough to make first-class brick has sense enough to watch and understand the market. If, for instance, he makes 5,000,000 of good brick per year as his regular work, and gets \$5 per thousand, giving him a profit of 20 per cent., and brick falls in price to \$4 per thousand, now what does good common business sense suggest? Does it say, "Keep right on making 5,000,000 brick per year?" Does it say, "Increase your output?" Does it say, "Have a convention of brickmakers and regulate the price of brick?" No. Good business common sense says, "Curtail your output to suit the demand as near as possible." Make 4,000,000 brick this year. If the market is still dull and lazy, curtail your product to 3,000,000, but hold on to your price—\$5 per thousand. Your profits will be just as good with a falling demand and a falling output as with a rising demand and a rising output at a low price.

—Supply and Demand Respond to Each Other on Middle Ground.—

The power to produce is many times greater than the power that consumes. This apothegm applies to brick as well as to the whole world of things. I can well recollect when such a thing as a brick machine was unknown. The old style hand method, all out in the open yard, was not sufficient to supply the demand in any regular way. Most of the supply came from very poor brickmakers. For instance, a poor brickmaker would take a brickyard on "shares" to run one summer. The owner of the yard would furnish everything necessary to carry it on excepting the labor and skill. The lessee would hire the labor to help him, and pay for it as soon as he had a kiln made and burned. This class of brickmakers would work about four to five months in a year and have the market glutted before September. Brick would sell for about \$3 per thousand, and that left the maker little or nothing for winter, so he would have to job around to make a living until springtime, then repeat his former experience, making brick "on shares."

There was another class of brickmakers more successful. Some of these were experts and some depended on hired experts. They would seldom make more than one kiln in a year, sometimes two or three kilns to supply a contract, but would always have one very large kiln to carry over for the early spring trade, which always commanded a high price. These brickmakers would sell their brick for more than twice the cost of making them, and always had money to enable them to hold their brick for a big price. They were the only class of successful brickmakers sixty years ago, and it would be well for the brickmakers of to-day to take some lessons from their practice.

—Brickmaking Has Improved with Rapid Strides.—

I need not repeat what is so often said on this subject. All any one needs to do to see and know the great improvement in clayworking generally is to take the public journals exclusively in this line. Brick are made now, in most all the brick plants, with as much regularity the year round as other goods. There is no intermission for the winter season. This enables the market to be regulated and kept steady in price, if brickmakers will conform the output to suit the demand. Of course, the stock of brick must accumulate during the winter season, because brick cannot be properly and well laid in cold weather.

—The Watchful Brickmaker Will Look to the Market.—

If the outlook shows that the demand will be dull, it will be good policy to run the plant on short time. For instance, run

the machinery eight hours instead of ten each day. If, when the market opens, the demand will not justify eight hours' running each day, then shorten the time to six hours. Keep up the price, and keep your works in operation, so that your employees will have a chance to make an honest living, though at reduced pay, which they will always prefer to idleness, which is demoralizing to the employe and damaging to the employer. Under no circumstances "shut down." It is a mean word and a mean policy. Good employees will always sympathize and cheerfully act with good employers. Their interests are, in fact, mutual, and their actions will always be co-operative when simple right and justice are fairly presented.

—Let Us Make Out a Case and See if We Are Right.—

A machine that will turn out about 17,000 brick per day, if run steady, would make about five millions of brick in one year. Price, \$5 per thousand; receipts, \$25,000; cost of wages to employes of all kinds, \$10,000; all other expenses, including interest, 10 per cent. on capital invested, and commissions, \$10,000; clear profit, \$5,000. Now, the demand for the next year is short 20 per cent., or 1,000,000 brick, so we will cut the output to suit the demand, and still maintain the price, \$5 per thousand. This gives us \$4,000 clear profit instead of \$5,000 last year. Now the question of labor hours comes up. We say to our employes: "You will have to work one-fifth shorter time this year. The demand for brick has decreased one-fifth, and we will have to suspend operations one-fifth of the year, or else work steady on short time. Now, you have been getting \$1.25 pay for ten hours' work. We propose to reduce that time to eight hours and pay you \$1 per day. Our profits this year will be short just the same as yours, and we think it will be to our mutual advantage to run steady on short time rather than discharge you at any time. If you are willing to do this you can keep your places steadily, and if the demand for brick should be greater next year than ever before, we will not only employ you at full time, but will increase your pay according to our profits." Any employe that has a proper sense of right and justice will not object to this proposition or hesitate to accept it, and so the plant goes right on without serious interruption or change in price for brick. The output has fairly responded to the demand. There are no strikes, lockouts or shut-downs, and all business proceeds without shock or any serious interruption of its welfare or progress.

—The Market Question of Brick Is Easy to Solve.—

The architects and builders in every city are well posted as regards the outlook for building, and they are always free and reliable in their expressions on the subject. Any brickmaker can avail himself of the opportunity to find out the prospects for the future demand of brick.

The clay journals, especially the Clay-Worker, are good mediums for information as respects the brick market, and just here I will say that if it is not too much cost and work it would be well for these journals to give a monthly statement of the condition of the brick market. To do this the patrons of these journals could be requested to give their opinions in brief of the market. The Clay-Worker has been doing this very efficiently so far as the New York market is concerned, but it would not be necessary to occupy as much space as is taken by "Oldtimer." He has a big market to report, and gives the brickmakers some good advice.

—The Brick Market Is a Very Peculiar One.—

So far as building material is considered, brick is the only one that is free from loss by time, fire or storage. Brick of best quality can be kept on hand indefinitely, without care or cost, save storage room and interest on the money they cost, so that the brickmaker can afford to make and hold brick on hand with a less margin of profit than any other manufacturer of building material. It is therefore best for all brickmakers to put brick at such a price as will pay them a reasonable profit, and then maintain the price steadily in the way I have before indicated.

It is not for the best interest of brickmakers to take the advantage of builders when brick are scarce. Let it be known and understood that brick can always be had at a fair, reasonable price, without reference to the supply. Twenty to 25 per cent. is a fair, reasonable profit for a brickmaker. If he makes only one million brick per year and saves clear of all proper cost \$1,000, and has that well assured by his skill and opportunities for the future, he is in better fix than the merchant who carries a large stock of goods dependent on speculative prices. The market side of brick depends much on the skill and energy of the brickmaker. If the market is good the brickmaker must be good. A bad brick will not sell in a good market at any price. So one of the primary wants and

needs of a good brick market is skill and ability to produce a first-class brick at a fair, reasonable price.

—Brickmakers Should Keep Out of Debt.—

Brickmaking is not a speculative business, but, if skillfully and wisely followed, is a sure paying business. The men who fail at brickmaking are speculative; they start out with the idea that if they have a good clay bed it is a sort of gold mine, and all they need is a brick machine and other big advertised improvements to develop their clay bed. They lose sight of two of the most important factors essential to success—skill and market. So they proceed until they have spent all the available cash in sight and find that they have failed, both in quality and quantity of brick, and are confronted with two serious difficulties, viz.: a want of market for their inferior brick and a want of money to continue their works. So they close up and advertise their plant for sale, or else it is sold by sheriff or receiver. If brickmakers are well skilled and confine their operations to the wants of the market they will always get good paying prices and a sure demand.

BRICKMAKING IN THE "WILD AND WOOLLY."

MAY BE SOME of the many readers of the Clay-Worker may be interested in what we are doing in this part of the country in the way of brickmaking.

The Parrot Silver and Copper Company, of Butte City, Mont., have erected a brick plant near Gaylord, Mont., for the purpose of manufacturing brick for the erection of a large smelting plant, also in building up a town at this place. The



BRICK WORKS OF THE PARROT SILVER AND COPPER CO.

brick plant is equipped with modern improvements, which consist of two Henry Martin steam brick machines, with pug mill attached, one Stedman disintegrator and pulverizer, which are under cover. The building is a frame one, with corrugated sidings, and is 62 feet long, 44 feet wide and 35 feet high from the ground, which is divided into engine room, boiler room, pulverizer screen and two machine rooms. The engine is connected by belt to main shaft, which is forty-five feet long, and the machines are connected on each end by clutches. There is a counter shaft running from this that drives the pulverizer, conveyor and elevator. The clay is hauled a distance of six miles by rail, which runs to a twelve-foot elevation in the yard on a trestle work, from which it is dumped into a large bin, 40 feet long, 12 feet wide and 12 feet deep. The clay is fed from this through a chute on to the conveyor, which carries it to the pulverizer; the latter is set on a rock foundation ten feet below the floor level. The clay passes from this machine down to an elevator, which elevates it fifty feet and empties it on to a screen set on an angle, which takes rocks, vegetation and all foreign substance out of the clay, which then goes down a chute to pug mill in a dry state. Water is then applied in a spray from a pipe, where the clay is thoroughly pugged ready for the brick machine. The brick, when made, are very strong and durable. Each machine turns out 25,000 brick daily. The plan for this plant was arranged by the present Superintendent, James Maxwell.

A SUBSCRIBER.

Gaylord, Mont.

Written for the CLAY-WORKER.

CHEMISTRY FOR CLAYWORKERS. No. 51.

RETURNING TO THE ELEMENTS, let us take for consideration that beautiful and useful metal—tin. In the first place, it may not be out of place to correct an erroneous impression prevalent amongst many clayworkers and others concerning tin. I have found many otherwise intelligent men regarding tinned plate as tin plate, having no idea that the tin dipper or bowl, so called, was an iron or steel vessel, coated with tin to prevent the iron or steel from oxidizing or rusting. Tin, then, is a pretty white metal, rivaling silver in luster, undergoing very little change in the ordinary atmosphere, whether dry or moist, and this is the reason it is employed to protect iron vessels or other articles. The symbol for tin is Sn. This is derived from its Latin name, Stannum, which has some reference to the ease with which it melts, about 230 or 235 degrees Cent., or 450 to 460 degrees Fahr. Its atomic or combining weight is 118, and its density or specific gravity is 7.3. It is a very malleable metal. By heating and hammering tinfoil is obtained. This foil, when amalgamated with mercury, is used for coating the backs of mirrors, usually called "silvering." Tinfoil one-thousandth of an inch thick is nothing uncommon. The tenacity of tin is very low. There are only two metals that I know which are less tenacious, viz.: zinc and lead, and it is questionable whether zinc or tin leads in tenacity, much depending on the physical structure of the metal tested. Thus, one authority says a wire, 2 mm. diameter, broke under a load of 24 kilos., while another says that a wire, 2 mm. diameter, broke with a load of 16 kilos. Both these are tests of tin, and I can only account for the difference on the ground of structure or chemical impurity.

Tin is reduced from its ores in a reverberatory furnace, very much like a shallow steel melting furnace. It was formerly smelted in a blast furnace, but the reverberatory furnace is now preferred on account of economy in both metal and fuel. The ore is known as tin stone, cassiterite, or stream tin. It occurs in veins, and is also found in river deposits; hence the name stream tin. It is an oxide (Sn O_2), and bears the chemical name stannic oxide. It is usually associated with other metals and minerals, and is consequently not a very pure metal when first reduced, notwithstanding the careful preparation the ore receives by dressing, stamping, picking and washing before smelting. The reduction of tin is precisely the same in principle as the reduction of iron. Carbon robs the tin of its oxide and escapes as carbonic oxide or carbonic acid, as the case may be. The crude tin just reduced is refined to some extent by a process called liquation. This consists in carefully heating the mass until the tin melts out and leaves a skeleton of the less fusible impurities, such as copper, iron, etc. This, of course, does not deprive the tin of such impurities as have their melting points lower than tin. This is followed by other refining processes, such as "poling" or "boiling," and sometimes "tossing" is resorted to. Poling or boiling is accomplished by forcing billets of hard green wood under the molten metal. The steam and gases given off by the wood produce ebullition or boiling, and a scum is raised on the surface, which is taken off and subjected to further treatment. This scum of impurities is also separated by the tossing mentioned above. Tossing is simply pouring from one ladle to another, one ladle being a considerable distance above the other.

The purity of tin is easily judged. If, on pouring into an ingot mold, it solidifies with a full, rounded form and its usual brilliant luster, it is passed as refined tin; if, on the other hand, its surface is somewhat frosted in appearance and not full in form, it is graded as common tin; if, in addition to being wanting in form and being frosted, it has also a yellow tinge, it is sent back for further refining.

—Compounds of Tin.—

There are several compounds of tin, the principal being the

oxides, chlorides and sulphides. The principal ore of tin has been described as an oxide. Now, tin has been described as nearly unchangeable at ordinary temperatures, in either a moist or dry atmosphere, but when heated much above its melting point it easily burns in air. It may, however, be heated a great deal above melting point in a brasqued crucible without losing weight. A brasqued crucible is the ordinary fire clay crucible, thickly lined inside with powdered charcoal. The charcoal is mixed with molasses into a thick paste and the crucible carefully coated inside with it. Then the crucible is heated until this lining is baked dry and hard. It then resembles coke, and is a safeguard against the contents of the crucible uniting with the materials of which the crucible is made, viz.: silica, alumina, etc.

The burning of tin in air produces a whitish powder or oxide, known as "putty powder." This is used for polishing marble and glass; telescope, microscope and photographic lenses

—Stannic Sulphide,—

Or "mosaic gold," Sn S_2 , much used in the arts, is not prepared by the direct combination of tin and sulphur, but by a complicated process of amalgamation and fusings, of little interest to any but those in the business.

All the compounds of tin are easily reduced with carbonate of soda on charcoal by the blow pipe, yielding a bead of metallic tin incrusting with white oxide.

—History of Tin.—

The Saturday Review of June 27, 1891, contained a brief history of tin which is well worthy of perusal. At that time, it will be remembered, there were very "spirited discussions" carried on in the Republican and Democratic newspapers about the possibility of this country making her own tin plate. That question is now settled, but the history of tin retains its inter-



BRICK WORKS AND EMPLOYEES OF THE PARROT SILVER AND COPPER CO.

are polished by it. Putty powder is made on a commercial scale by heating metallic tin in a reverberatory furnace, with an oxidizing flame, of course, and constantly raking out the dross, or crude oxide, as it is formed. This crude oxide is subjected to calcination and grinding, and is then the putty powder of commerce.

From this oxide of tin, Sn O_2 , is prepared a mordant, much used in calico printing. A mordant is used to fix colors. It is prepared by boiling oxide of tin with soda, and has the composition $\text{Na}_2 \text{SnO}_3 \cdot 4 \text{H}_2\text{O}$, chemically called sodium stannate, but by the dyers or printers "tin prepare liquor." Another mordant is tin dichloride, or stannous chloride, Sn Cl_2 . In the trade this is simply called "tin salts," and is prepared by dissolving tin in hydrochloric acid. When the solution is concentrated the salt separates out in needle-shaped crystals, having this composition: $\text{Sn Cl}_2 \cdot 2\text{H}_2\text{O}$. This is also a much used mordant by the dyer and calico printer.

est, and is reproduced here, with some slight corrections, etc.:

"In Genesis, shortly after the description of the flood, will be found a reference to Tubal Cain, 'an instructor of every artificer in brass.' This fixes the discovery and use of tin and copper, according to the Bible, at between 4,004 and 1,635 years before the Christian era. (I must here take exceptions to the writer's accuracy in quoting the Bible. This reference to Tubal Cain occurs long before the flood. See Genesis, iv, 22. My reading fixes this date before the birth of Seth, Adam's third son, whose birth occurred soon after Adam was 130 years old. Consequently, on the 4,004 years basis, Tubal Cain lived more than 3,874 years B. C. Further, we must assume that the brass mentioned was a similar alloy to that of brass of the present time. This being conceded, it follows that at that early period they knew the art of reducing both tin and copper from their ores and alloying them.—W. W.) And not only were the existence and use of these metals known, but the art of converting

them was soon far advanced, for we find in the book of Kings, written 1015 B. C.: 'King Solomon sent and fetched Hiram out of Tyre. He was a widow's son, of the tribe of Naphtali, and his father was a man of Tyre, a worker in brass, and he was filled with wisdom and understanding and cunning to work all works in brass.'

"Any one doubting the nature of this metal can be reassured by reference to the chapter which follows, giving in detail a most elaborate schedule of the pillars, the chapiters, the baths, the lavers, the pots, the shovels and the basins, some of cast and some of wrought bright brass, which Hiram, the artificer, prepared for the temple of King Solomon. (Here, again, the writer's quotation of Scripture is not quite accurate, or, rather, his reference thereto. All that he quotes and the detail he refers to concerning the nature of the metal is to be found in 1 Kings, vii chapter, beginning at the thirteenth verse. The chapter following the one referred to is devoted to a description of the feast of the dedication of the temple, sacrifices, peace offerings, etc. This little criticism on the writer's careless handling of Scripture is in no way intended to invalidate his deductions as to the antiquity of tin, but it may serve to show that however learned and popular a writer may be, his work should not be accepted as so precise and correct as to be beyond the pale of criticism. Again, I say, this remote antiquity of tin depends on the nature and composition of the metal which translators of the Bible have called brass. Further, it is somewhat remarkable that we have no mention of copper, which necessarily antedates brass.—W. W.)

"Further, ample evidence as to the early use of tin and brass is to be found in the Iliad of Homer, written, as it is believed, between the years 962 and 915 B. C.

"We find, then, that brass—and consequently tin—existed in Tyre, the great seaport town of the Phoenicians, on the coast of Syria, about 1,000 years B. C. The Phoenicians were merchants, and carried on an important trade from the ports of Tyre and Sidon. These cities rivaled each other in magnitude, fame and antiquity. The Tyrians excelled all other nations in the manufacture of a purple dye, said to have been extracted from a shell fish found on the coast. It is now well known that tin, dissolved in muriatic acid, produces a brilliant purple dye, and that tin, dissolved in nitric acid, will produce a scarlet dye. It is not unreasonable, therefore, to suppose that the use of tin in dyeing had much to do in the production of the Tyrian purple of the Phoenicians. (I will not here question the statement as to the muriate and nitrates of tin being employed as dye stuffs, but we cannot escape the conclusion that these ancients must have been familiar with the properties of both nitric and hydrochloric acids to enable them to make the muriates and nitrates.—W. W.)

"It is impossible to fix the date at which the export trade in tin was commenced from the British islands, but it is certain that it existed and was controlled by the Phoenicians when Herodotus wrote his history, 450 B. C. Herodotus refers to the Cassiterides (the Scilly islands) as the places whence they were obtaining their supplies, but neither he nor any other historian has left us any information as to when the trade commenced. The Phoenicians called this land of tin 'Baratanac,' and Bochart and other historians attribute the very origin of the name of Britain to this work.

"After the Phoenicians, the trade in tin with the Cassiterides was taken up by the Greeks, sailing out of Marseilles, the city of Massila, which was built by a colony of Greeks 600 B. C. The Phoenicians probably sailed straight across from their colony of Gades or Cadiz, and returned direct to that port with their valuable cargoes. The Greeks, however, appear to have been accustomed to coast up the English channel, and, crossing over from Kent to France, the tin was conveyed overland on horseback, in thirty days, to the mouth of the River Rhone.

"The Romans, who had always been large purchasers of tin, were the next to follow the Phoenicians and Greeks. As soon as the Romans made a conquest of Britain they formed in the tin provinces camps and roads (still visible), and left behind

them vases, urns, sepulchers and money, that exhibit daily proofs of there having been a stationary people in these parts, and that Damnonium extended even to the Polerian promontory or the Land's End, limited by the western parts of Somersetshire. The Romans, as is well known, occupied Britain from B. C. 55 to A. D. 409, or 464 years, during which period the Cornish tin mines were largely worked by the ancient Britons, possibly for their own advantage, but more probably as serfs, and in A. D. 409 the Romans had to give way to the Saxons.

"During the Saxon dominion (from 410 to 1066) the mines were almost entirely neglected, frequent intestine commotions and the subsequent wars with the Danes allowing no time for such innocent and peaceful pursuits. In the year 1066 the Saxons, in their turn, were pushed aside by the Normans, and subsequently the mines in Cornwall were again vigorously developed. The Norman sovereigns derived immense revenue from the export of this metal, and in the year 1198, when the country was almost ruined by the Crusade, Richard Cour de Leon, then abroad, placed the management of the mines in the hands of the Archbishop of Canterbury, who, from this and other



HISTORIC PITCHER OF 1812-1814. NAVAL. Enoch Wood & Son, Staffordshire. Very large, holds 1½ gallons.

sources, was enabled to collect and remit to his employer a sum of money exceeding 1,000,000 pounds sterling.

"In the reign of King John (1199-1216) the produce was so inconsiderable that the rent of the tin farm amounted to no more than 100 marks.

"In the year 1240 tin was discovered in the mountains of Bohemia by a Cornish tin man, who had been banished from his native country, either on account of his religion or because he had committed murder. Further discoveries followed at Altenberg, in Saxony, in 1458, and in Barbary, 1640.

"Richard, Duke of Cornwall, brother of Henry III, 1216-1272, derived immense profits from the mines. In 1376 the tinners were able to obtain protection by act of Parliament, but the civil wars following (viz.: the Wars of the Roses), the mines were again very much neglected. When, in 1485, these wars ceased, England became settled and tin mining became more profitable and prosperous. Prudent Queen Elizabeth (1558-1603) appears to have taken more interest in the mines than her predecessors, for she sent to Germany and brought over German miners, by whom many of the Cornish processes were very much improved.

"Very little has been written, and next to nothing can be as-

certained, of the progress of this trade from 1600 to 1700. The history of tin from the latter date to the present day is only a question of figures and statistics, which are beyond the scope of this article.

"The discoveries of tin in Germany five hundred years ago, which never became important, were practically abandoned several years since. Cornwall has safely defied all competition from Europe and the East, but the cloud which threatens her has risen in the South, in her own colonies. In the year 1872 large discoveries of surface tin ore were made in Queensland and New South Wales, and all at once a new supply appeared to find a sale in Europe."

As many of the alloys of tin with copper, lead, antimony, bismuth, cadmium, mercury, etc., were given in one of the earlier papers of this series, they need not be repeated here.

WM. WAPLINGTON.

Written for the CLAY-WORKER.

GREAT HISTORICAL PITCHER OF 1812-1814.*

BY MRS. MARY E. NEALY.

THE SUBJECT OF THIS SKETCH is the most notable and probably the largest pitcher ever made for table use or as a memento of victorious battles. I copy the description by the owner, Mr. Horace Jones Richards, of Troy, N. Y., which is sent with the photographs:

"Capacity—Eleven and a half gallons.

"Used first at the reception given to General Lafayette, Sept. 18, 1824, at Troy, N. Y.

"Description—First side:

"Portraits—Commodore Decatur,

Commodore Perry,

Captain Hull, of the Constitution.

"Naval Monument,

Perry's Victory on Lake Erie,

Chesapeake and Shannon.

"Front:

"(Name) Horace Jones, (of owner.)
Troy.

"George Washington. (In relief.) John Adams.

"Back:

"(Name) Enoch Wood & Sons, (of manufacturer.)
Burslem, England.

"Second Side—Description:

"Portraits—Captain Jones, of the Macedonian;

Major General Brown,

Commodore Bainbridge.

"Constitution's Escape from British Squadron,

MacDonough's Victory on Lake Champlain,

Eagle; American Coat-of-arms."

This pitcher was made to order for Mr. Horace Jones, of Troy, N. Y., early in 1824, and was sent by the manufacturers in Staffordshire, England, in good season to be used at the banquet given to Lafayette at Troy in September, where it was an object of great interest to the guests of that season.

The engravings which decorate the pitcher are printed in black, and are fac-similes of the cuts published in a pamphlet entitled "Our Monument" (of which the owner has a copy) by "A. Bowen; Boston, 1816;

No 1, Cornhill." These were printed upon the white body of the vessel, and glazed afterward.

The coloring upon the other portions is very handsome. The

*These sketches are all copyrighted for Mrs. Nealy under the title of a future book upon old china.

bands are of green, black and gold, the broad band near the top being in pink, touched with gold, which makes a fine contrast in color.

This pitcher has been used upon many other gala occasions, and has been loaned for exhibition at Boston, Saratoga, Albany, the Masonic Fair and the Columbian Exposition at Chicago.

Meanwhile it has never yet been engraved, and will appear first in this article, for which Mr. Richards had the photograph made and secured the copyright. If illustrations could all be drawn "to scale," as the artists say, these would occupy much space and outmeasure all others. But as this is impossible, it must be left to the imagination of the reader. Mr. Horace Jones Richards, of Troy, N. Y., is the owner, and Horace Jones, of Troy, who had it made, was grandfather to the present owner.

Mr. Richards sends a picture of a small piece of china, which, as another naval relic doing honor to a member of the same family, deserves mention in connection with the pitcher. This is a small Chinese sugar bowl, belonging to a tea set captured with a British ship at Little York, now called Sackett's



HISTORIC PITCHER OF 1812-1814. Naval. Enoch Wood & Son, Burslem, Staffordshire. Very large; holds 11½ gallons.

Harbor, by Lyman Kellogg, Lieutenant United States Marines, a grand uncle to Mr. Richards, the owner of the pitcher. The china set was the property of the British officers, and was divided out as souvenirs of the occasion. Lieutenant Kellogg's vessel was the Madison.

An anecdote comes with this bit of china which is told of this officer, and, as it is brief, is worth telling. At an entertainment given on Lake Ontario during an interval between the fighting, to the officers of the British fleet, under Sir James Yoe, and the American fleet, under Commodore Channing, a British officer proposed the toast: "The President of the United States, dead or alive." This rather unsettled Lieutenant Kellogg, who almost immediately offered this toast: "The Prince Regent of England, drunk or sober." (Madison was our President and the Prince Regent was afterward King George IV.) This created quite an uproar, which, however, was soon quieted. It would require a good sized volume to tell half of the stories and anecdotes associated with the decoration of this fine old pitcher. It would, indeed, comprise a large portion of the history of the war of 1812-1814.



NAVAL PRIZE.

Written for the CLAY-WORKER.

THE APPLICATION OF WATER TO CLAYS AND ITS EFFECTS UPON THEM IN THE MANUFACTURE OF BRICK.



THE EXACT PART that water plays in the manipulation of raw clay to produce brick mixtures is a subject to which little attention is given beyond the mere fact that water does render the clays sufficiently soft to mold them into any desired shape.

Its effect upon the brick mixture is of the greatest importance, and controls, to a large extent, the nature and value of the burned wares when they are taken from the kiln.

One of the chief properties that makes water indispensable in the arts is its power to carry substances in solution. The expression, "substances in solution," however, is often misused, the application quite frequently being made to "substances in suspension." I have heard manufacturers speak of clays "in solution" in water, when they had reference to a very thin mixture of clay and water.

The constituents of pure fire clays, viz.: anhydrous silica (quartz) and silicate of alumina (kaolinite), are not soluble in water, but when treated with either hot or cold water, after continued stirring, still remain "in suspension." Plastic fire clays, and especially the "prepared" or "ground" fire clays, are so fine that when a small quantity has been agitated with water, and while the emulsion remains in motion, about all that is precipitated is the heavy quartz particles.

Substances are in solution in water when they have completely lost their identity to the eye and leave no traces of suspended or precipitated matter. You can dissolve an ounce of sugar in a quart of water, and when the solution of the sugar has been effected the water presents no traces of undissolved particles, either diffused throughout the liquid or settled to the bottom of the vessel.

When an ounce of ground fine clay is stirred into a quart of water it becomes cloudy, and we find illustrated here "substances in suspension" and "precipitated matter."

If the proper sort of a filter were used it would not be a difficult matter to make a perfect separation of the water and undissolved substances.

The percentage by weight of mineral constituents that the water has taken from the clay and carries in solution would hardly be appreciable.

Of the accidental impurities in clay, there are many soluble in water, but since the purest fire clays usually contain less than 1 per cent. of any of them, the percentage in the aggregate of such substances soluble in water would be small.

In air-dried clays the percentage of water, free and combined, depends upon (1) its natural physical condition, or the state to which it has become disintegrated, and (2) its chemical composition. The clays highest in kaolinite are the most generously supplied with combined water, and often, by virtue of their extreme fatness, are capable of carrying the greatest quantity of hygroscopic or uncombined water. The air-dried high siliceous clays, with their small percentages of that aluminous constituent, are charged with the least amount of water or moisture. The volume of water required for converting these two extreme varieties of fire clay, fat and siliceous, into a sufficiently soft condition in which they would be fit for pug-ging and molding into brick follows the same law; the fat, aluminous clay will absorb far more than the siliceous clay needs in bringing them to the same consistency.

As a rule, fire brick mixtures are compounded from more than one grade of raw clay, and the manufacturer depends upon his pug mill for blending them together so perfectly that any portion of the mixture, however small, will carry each grade of clay in the same proportion as they were added, or each thoroughly disseminated throughout the mass.

In chemistry we learn from laboratory experience that two solutions can be successfully mixed much more quickly and thoroughly than two powders.

These solutions are usually in the fluid state, while such pulverized bodies are solids. In physics we learn that

First—A solid is a body whose molecules change their relative positions with difficulty.

Second—A liquid is a body whose molecules easily change their relative positions, yet tend to cling together.

Third—A fluid is a body whose molecules easily change their relative positions, and manifest little, if any, tendency to cling together.

Air-dried clays that have been ground can be mixed more effectually than those semi-dry. Clay mixtures are never pugged in a condition that can be even regarded in a liquid state; however, when very soft, they are just beginning to approach a liquid, and we are able to see illustrated there a magnified and strongest inclination of the molecules to stick together.

This clinging effect is very characteristic of those substances possessing an affinity for water. When the clay has been satisfied with respect to combined water, theoretically it has no more chemical affinity for that substance, but, practically speaking, it greedily gathers up and persistently retains large percentages of water while it is manipulated in the factory.

Its ability to carry so much hygroscopic water, mechanically mixed, seems to impart to the mixture that "clinging" nature.

The only perfect way, then, in which two plastic ground clays, radically different in composition, can be made to distribute themselves evenly throughout the resultant mixture, and in absolutely the same proportion as they were added, is to have them beaten up in a thin, watery state.

Such a discussion as this only serves to illustrate the advantage of pugging clay mixtures in the soft condition. While the results obtained by mixing ground air-dried clays is a more effectual plan for blending their constituents uniformly than to pug the raw lumps of clay semi-dry, the same brick mixture is quite as much in need of a final and thorough pugging, soft, to finish that complete mingling together of its finer particles and to bring into play the real strength of its kaolinite bond. The three general and important results obtained by the addition of water to clay mixtures are:

First—Disintegration.

Second—Distribution.

Third—Development of plastic bond.

In the preparation of brick mixtures consisting of the plastic clays water is not added for the purpose of developing any chemical changes. It softens the lumps and renders the molecular structure of the mass more compatible. As the hard, compact lumps absorb the water, their molecules find it more and more easy to move upon one another, till finally they are held together only by their plastic nature and mutual thirst for more water.

When clay has been made very soft by the water its condition makes it possible to penetrate into the small interstices of the clay biscuit to which it must fasten itself. The plasticity of clay can only produce its most perfect bond in the burned ware when enough water has been added to the stock to develop every trace of that property, and the "biscuit" or other non-shrinkable material, of which the mixture is in a condition to receive it. If we make brick from two mixtures, both consisting of raw and calcined clays, composed of pure plastic kaolinite, and in one use only hard, non-porous biscuit, while in the other biscuit that is capable of absorbing water freely, we will find the burned ware of the former is friable and soggy, the latter sound and tough.

In the first case the soft clay has not been able to send its plastic kaolinite into the pores of the biscuit, but the more porous biscuit of the second mixture has received the aluminous constituent of the clay, and thereby enabled it to effect a bond between the calcined and raw clays. Hard, vitrified "biscuit" of a very refractory nature is no better than crushed quartz

rock, for both have no means of gripping the kaolinite.

Again, the shrinkage of the soft "biscuit" is by no means complete. No doubt it has been relieved of all its moisture and combined water, but when the biscuit is reburned in the brick mixture it has yet to receive its "shrinkage due to partial fusion."

Even if the brick is repressed stiff, the complete shrinkage of the raw clay constituent is probably double that which the soft biscuit must yet receive, still their shrinkage factors are not so widely different as they would be if the prepared biscuit were vitrified.

When clay mixtures contain soluble substances the tendency is for the water to carry such ingredients along with it, and in the rough molded brick we will find it gradually depositing itself on the surfaces as the stock grows stiffer. For example, if water heavily charged with salt is used for dampening the mixture before it is pugged, the crystals of salt will begin to appear on the surfaces of the stock when it is in fit condition to be pressed. The result can hardly be caused by the evaporation of the water, for if you were to allow a vessel containing the same salt solution to remain in a warm place the water would pass off and leave absolutely all the salt behind—unless the temperature became very high, indeed.

No; the molecules of clay seem to displace the salt water and slowly force it to the surfaces of the green stock, because when the brick is ready for pressing a large percentage of all the salt in the brick has reached its exposed surfaces.

CHARLES FERRY.

Written for the CLAY-WORKER.

DOWN THE SUNDAY CREEK VALLEY.

The Ohio State University Class in Ceramics Goes a Visiting.

ON A PLEASANT AFTERNOON our party, consisting of professor and students of the Ohio State University Ceramic Department, boarded a south-bound train for a short visit to one of Ohio's great coal and clay regions, the Sunday creek valley. The trip was to be an extension of class-room work, studying in actual practice what had been taught in the lecture room. The route, as mapped out by Professor Orton, included as many of the representative clayworking establishments of southern Ohio as could be reached in two brief days' time. A trip like this was exactly what the boys wanted; they were ready for hard work, but they also expected to get their share of fun out of the occasion.

It was found best to stop over night at Shawnee, a typical coal mining town, which could not be praised for its beauty by even its most enthusiastic inhabitant. The hotel accommodations could also be slightly improved, according to the statement of one of the boys, but then he was a little unreasonable in wanting a towel all to himself. Bright and early in the morning the boys were hustled out to start the day's work. The first part of the programme was a visit to the brick works of the Ohio Mining and Manufacturing Company, which is under the management of Mr. W. D. Richardson, well known to many of the readers of the Clay-Worker. With his usual courtesy he gave us the freedom of the yard, and himself assumed the office of guide. The plant is still in process of construction, though making brick, and it is the intention of the company to manufacture only the finest dry pressed brick, a line in which Mr. Richardson has established a reputation for himself. There is an abundance of clays, burning all colors, from white down through the buffs, yellows, terra cotta colors into red. For the winning of the white burning material a fine shaft is being sunk at present to the horizon of the Putnam Hill limestone, here under deep cover. The clay preparing machinery is of the most elaborate kind and the importance of thoroughly preparing the material has been fully realized. The facilities for storing the clay are excellent. Two Simpson dry presses are in position and one in actual use. Before entering the kiln the brick are perfectly dried in a Standard drier. The burning is

done in a battery of six square Yates kilns, and what burning has been done in them is of a highly satisfactory character. Parallel to the line of kilns runs the stock shed, from which the brick can be loaded direct into the car. That the progressive spirit pervades this plant is shown by the fact that a test house and laboratory has been constructed, a neat buff brick building, equipped with a trial kiln and necessary outfit of apparatus for testing purposes. In fact, the factory may be considered a model dry pressed brick works in every particular. After the entire class had looked over the plant together a de-



OHIO MINING AND MANUFACTURING CO'S WORKS.
SINKING A SHAFT FOR THE LOWER VEIN OF FIRE CLAY, HORSE
WINSE IN THE FOREGROUND—FRONT VIEW—REAR VIEW.

tail study of it was made by the boys, each one of them being assigned a certain task; for instance, one had the clay bank, another the machinery, another the drier, another the kiln, and so on. Afterwards the detailed data was collected and compared, so that all obtained the benefit of the individual observations of each.

But time passed rapidly, and before we knew it our allowance of time was up. Owing to the lack of railroad accommo-

dations we had to start on a little six-mile walk to a place called Drakes, in order to catch a train to Glouster, our next stopping place, and we had an hour and thirty minutes to do it. Headed by the Professor, the party rapidly forged ahead on the railroad track. As we rounded a curve about a mile from the Drakes station a train was noticed standing at the



KILN YARDS AT WASSALL FIRE CLAY CO., Glouster, Ohio.

depot, which we supposed was our train. Professor Orton was not willing to miss the train without a final effort, and the next thing the boys saw was the Professor flying down the track at an astonishing gait. After a second of mute admiration of our teacher's sprinting power we gave chase, with the representative of New York State, who, by the way, is a renowned member of the college football team, as first, followed by the rest of the party, with Virginia, represented by a portly, puffing young gentleman, as a good last. Luckily, we caught the train, having established a record of one hour and twenty-five minutes for six and one-half miles of badly ballasted railroad track.

The dinner we struck at Glouster made a wonderful difference in the view we took of life in general, and our afternoon programme of walking in particular, and at 12:30 we started out once more. The next plant on the programme was the Wassall Brick Works, near Glouster, manufacturing paving brick. A cordial welcome was extended us by the Manager, Mr. J. W. McDowell, and a thorough inspection of the plant was made. A pretty hard shale is worked, mixed with fire clay, which is mined from the same hill. The machinery consists of a dry pan, shaking screen, wet pan, auger machine, Wellsville cutting table and two single die Raymond represses. The drier is a home-made tunnel drier, heated by radiation from a flue under the tracks. The burning is done in twenty-six-foot round down-draft kilns, each cluster of four being connected to sixty-foot iron stacks, six feet in diameter.

Our allowance of time having been spent, we made our way to Trimble, a mile distant, where another plant was to be visited, the Trimble Brick Company. Here again our party was kindly received by Mr. J. W. Davis, the Secretary and Manager. At this place the shale bank is virtually the same in character as that of the Wassall Company, though not so abrupt in slope, and it is endeavored to work, as much as possible, of the soft crop shale, taking advantage of the plasticity given by centuries of weathering. The material is conveyed to the works on a trestle, at a very steep grade and a dizzy height. The Virginia member of the party concluded not to risk life and limb in ascending the trestle, after getting half way up, and waited at the bottom of the hill, viewing the bank from a distance. In descending, our Minnesota student, who showed great courage on the uphill climbing, thought the gaps between the ties were a little too wide for comfort, and he hit on a safe, though not very expeditious, way of lowering himself down, by firmly

grasping the wire rope and going down hand over hand, in an attitude which could be used as an illustration of the Darwinian theory. We were just too late to get the camera in action on this scene. The loaded cars pull up the empty ones, a band friction brake being used on the winding drum. A fine set of machinery was found at this concern, consisting of dry pan, revolving screen, pug mill fed from a bin, an auger machine and an Eagle repress. The drier is a five-track ironclad, and the kilns are of the round down-draft type, with a solid floor. The entire works show admirable system in the laying out of the plant and in all the arrangements, and it was a pleasure to behold them.

In the evening the boys organized a night excursion into a large coal mine, where a coal mining machine was seen at work, driven by compressed air. The night was spent at Glouster, and none of the party had occasion to complain of sleeplessness. "But oh! what a difference in the morning!" At 5 a. m. we had to tumble out and board our train to Crooksville, a pottery manufacturing center of much importance. There a visit was first enjoyed with the Star Stoneware Pottery, where Messrs. W. H. Brown and M. B. Cooper welcomed the boys with a cheer which made them feel right at home. This factory produces stoneware of all kinds, and does some special work along the line of chemical stoneware, of which some huge pieces had been turned out. They have also started in a line of specialties, decorated with a white glaze and under glaze slip colors.

Next the party visited the Diamond Pottery, a very well arranged plant, where they were welcomed by Mr. W. H. Stoneburner, who placed the works at our disposal. A kiln under fire was an interesting feature seen here.

By this time it was noon and we adjourned for dinner only to be interrupted by our train. The next part of the programme was a side trip to Roseville, three miles northeast of Crooksville. Among the brick plants and potteries of this active town we could only visit two, and those the two nearest. So we went first to the Roseville Brick and Terra Cotta Company, where Mr. Myers, the Superintendent, welcomed us most kindly, and took great pains to explain all his arrangements. The shale bank presented an ideal geological section, showing four different horizons of shales and fire clays, very distinctly exposed by the work which has been done. The preparing machinery con-



DIAMOND STONE WARE CO'S WORKS. Showing Ware piled up in the Foreground.

sists of a dry pan and a wet pan, the latter being run on the continuous plan; that is, clay dust is being fed into it constantly and tempered clay is taken out, the latter operation being accomplished by means of a home-made contrivance. This seemed to all a most novel and ingenious thing, which is capable of extended application to shale clays, which need more efficient tem-

pering than they get in a pug mill. An auger machine is used, an automatic cut-off table and an Eagle repress. Of special interest is the drier, constructed by Mr. Myers, which utilizes the radiating heat of the kiln. It is constructed above three of the kilns, and in it the brick are handled by means of a novel truck system. While this drier is not in use at present, it has demon-



CROOKSVILLE STONE WARE CO'S WORKS. Crooksville, Ohio.

strated practically that the radiated heat wasting constantly from the surface of ordinary down-draft kilns is ample to dry more brick than the same kiln can burn. When the heat escaping out of the stack in burning and cooling is considered, this little illustration furnishes an eloquent commentary on American fuel economy. We could hardly tear ourselves away from this most interesting plant, and as we retraced our steps to the station we were more and more convinced that the management of this brick plant is in the hands of a mechanical genius of high order. After having spent a few short minutes at the Midland Pottery, on our way to the depot, we returned to Crooksville. Having some time to spare before the Columbus train, the boys scattered; some of them, remembering the kindness experienced there, returned to the Star Pottery, and at train time made their appearance loaded with souvenirs. One of the party went on the war path with the Professor's camera, and would have used up all the plates in the holders had he not been interrupted by the arrival of the train.

The party, which arrived at Columbus at 6 p. m. Saturday, was a tired and footsore one, but all felt that the two days' work had yielded most profitable and enjoyable results.

A STUDENT.

TERRA COTTA BUILDING BLOCKS.

WE HAVE RECEIVED a pamphlet of extraordinary interest. It is that of F. A. Griffin & Co., manufacturers of hollow terra cotta building material. Their office is in the Chamber of Commerce Building, in Chicago, and their works are at Griffin, Ill.

We say that this pamphlet or circular is of extraordinary interest. It is so, because it takes a perfectly feasible scheme, the manufacture of terra cotta building blocks, and presents the advantage of that system in a masterly manner.

The manufacture of building blocks of terra cotta is not absolutely a new idea, but there are ideas as old as the hills which have not yet been given practical form. Hitherto we have seen nothing which was distinctly promising in building block construction. We mean by building block construction the manufacture by mechanical means of certain standard constructional and decorative forms which are useful in the construction of buildings, without the necessity of special models, forms and details for each particular building, which is now

found necessary under ordinary building methods. Attempts of this kind have been made heretofore, but not with the ingenuity and practical methods and varying forms which appear to be present under the system put in practical operation by this firm. It is necessary that the constructive forms should be complete, and that at the same time there should be presented a certain standard of artistic excellence. In both these elements this firm appears to have excelled, though we are free to say that their constructive methods appear to be in advance of their artistic resources. This, however, is a matter which may be remedied.

One does not need to consider the constructive excellence of terra cotta. That argument has long since been made, and it is without question. The manufacture of standard forms of terra cotta blocks at a low cost by machinery is the purpose of this firm. It is the claim of Griffin & Co. that by a system of ingenious machinery they have been able to produce terra cotta in a more perfect manner than can be done by hand, and at least twenty times less cost for labor than if done by hand workers. They claim that the hand-made material cannot be compressed to that extent that it can by metal dies under 25-horse-power pressure, and that it is consequently stronger and less porous than hand-made material. They claim that it is more uniformly and perfectly cored, and that because of the possibility of great compression and better coring they are able to produce a much lighter ware of uniform thickness of wall and abundant strength.

It would appear that with the mechanical methods at hand the facilities for the production and reproduction of decorative forms is quite feasible. Certainly there is no reason why any color, surface or finish might not be given. It is the arrangement of the constructive forms which demands the most serious attention, and this feature of the work appears to have been considered with unusual intelligence. The forms for plain wall surfaces are arranged with reference to bonding, proper general strength and interesting appearance. The construction of corners, of varying angles for bay windows, towers, etc., is varied, practical and pleasing. The construction of window jambs is of such a character that the ordinary box frames are not required. The pulley stiles, with their outside hanging stile for outside shutters, and the inside bead and casing are applied directly to the ware, so that the box and frame which contains the weight and cord are formed within the ware itself.



STAR STONE WARE CO'S WORKS, Crooksville, Ohio.

Plank window frames and door frames are applied in the same manner, and may be made in any design to suit the taste or caprice of the builder or architect. Certain standard forms of water tables, window sills, string courses, cornices, corners and angles are clearly set forth in this pamphlet. Methods for placing joists, the arrangement of hot air and smoke flues, con-

struction of chimneys above roof, and, in truth, all of the ordinary constructive requirements, appear to have been met.

The manufacture of standard forms of building blocks to be used in this way has always been a hobby of ours, and we believe that in time it must succeed. This is the best practical working out of the idea that has yet come to us. We do not wish to be considered hypercritical when we state that there is yet wanting in this establishment a better working out of the artistic detail, which in no way affects the value of its constructive excellence. It takes no more material or labor to produce a form of great refinement, one of great artistic excellence, than it does to produce those which are relatively ugly. While it is true that this firm has gone further in the direction of pleasing architectural decoration than others who have undertaken the same line of work with building blocks, yet it is far from reaching the limit of possibility in this direction, and, considering the fact that it will cost no more money to reproduce good designs than bad designs, it will be deplorable if it does not accept an opportunity which is at hand. One may have the constructive forms never so ingenious or perfect, yet it is apparent that the great success from a commercial standpoint of an undertaking of this character is dependent upon its artistic appearance. If this concern will fulfill its other promises and employ a proper architectural critic, there can be no question of its great success. Without the art it may succeed fairly, but must fail of recognition in many directions. We say this in the kindest spirit and hoping for the great success of this worthy undertaking.

Written for the CLAY-WORKER.

THE CLAYWORKING INDUSTRIES OF VICTORIA, AUSTRALIA. No. 2.

BY F. A. CAMPBELL, C. E.

(Building Brick Continued.)



IN THE FIRST PAPER a description of the Hoffman Company's works was given, as representing the largest type of brickmaking establishments in these parts. To supplement this, a brief notice of another of our larger works may be of interest, although conducted on very similar lines to the Hoffman.

The Northcote Brickmaking Company's works are situated at Northcote, about four miles north-east of the city, upon the same belt of clay shale which runs through Brunswick, where the Hoffman Company's establishment is. The works were commenced in 1873 by Groom Brothers, from whom they were acquired by the present company. The Chairman of Directors is R. Grieve, the Secretary J. J. Osborne and the Manager Thos. Weatherall. The latter gentleman has been in charge of the works for the past eighteen years, and is a thorough expert in all the processes required to make a first-class building brick.

A general view of the greater part of the works is given in photo No. 1. Three of the kilns are visible. The main buildings in which is the machinery stand grouped together in the center, while the clay pit may be seen upon the left.

The clay is a hard shale, similar to that of the Hoffman Company. It is now being raised from a large circular-shaped excavation close to the main building. The pit is being worked in a thoroughly systematic fashion, the method of taking the clay from the bank to the crushers being most business-like. The bottom of the pit is nicely graded, with a uniform slope down towards the side next the works. From the foot of the face, all round, tram lines converge to a shed which stands at the bottom of the inclined tramway running up to the main

buildings. When the trucks are filled at the face they run by gravitation to this central point, each carrying its load of clay, and also a man, who, when the truck arrives on the wide iron plate on to which all the tram lines lead, springs off and neatly turns it on to the end of the main line leading up the incline. He then returns to the face with one of the empty trucks. The



GENERAL VIEW OF NORTHCOTE BRICK CO'S WORKS.

scene is a busy and exhilarating one, which it is a pleasure to watch. Each truck, which is of iron, has a clip projecting above the center of one end, into which the chain which passes up one line of the inclined road and down the other is pressed by the man in charge at the foot. The chain, which passes round a drum in the building above and a horizontal pulley on a framework at the lower end of the incline, is kept in constant motion, the number of trucks hitched on being regulated by the man at the foot. Photo No. 2 gives a good idea of the appearance of the incline as viewed from the bottom. The small figure upon the upper edge of the excavation is the Manager signaling the engineer to stop the rope for the convenience of the photographer.

At the top the tram line leads into a shed, being continued from the point of entrance for a short distance horizontally, and as the rope continues still upward it releases itself automatically from the slot in the truck. The man here receives the full truck, pushes it across a short space of iron floor into a cage, which, balanced on trunnions, tips over, and the stuff is poured into a chute leading into a dry pan crusher. The cage then rights itself and the truck is pushed upon the upper end of the descending line; the chain is pressed into the slot and it departs again for the pit.

The incline is four hundred feet in length, the speed of the chain one hundred feet per minute, the trucks hold nearly half a cubic yard each, and there is a delivery of about three-quarters of a cubic yard per minute.

After leaving the trucks the clay passes into dry pan crushers, of which there are two, nine feet in diameter, with crushers five feet six inches in diameter, having a capacity of 3,000 brick per hour. These machines are of Victorian manufacture, cost \$1,250 each, the makers being Messrs. Jacques Bros., of Richmond, Victoria.

In these pans the stuff is well pulverized and passes through perforated plates in the center of the pans, the diameter of the perforations being three-eighths of an inch. This is the only preparatory treatment the clay receives, being then carried right away to the brick presses.

There are six of these presses, which stand in rather an imposing row upon the ground floor of the principal building. They are all Bradley & Craven's patent double-mold machines, made in Langland's foundry, South Melbourne, the cost being \$5,500 each.

Facing the brick presses, and connected with them by tram lines, are five Hoffmann kilns of sixteen chambers each, which

are well constructed, but present no features requiring any special comment.

The whole arrangement of this yard is most business-like, and speaks well of the Manager's powers of organization. The Northcote brick are held in high esteem by builders, and rightly, too, for they are a first-class article. The company can turn out one and a quarter million of brick per week, and, although they are not working up to this quantity at present, are probably turning out a greater number than any other establishment in the colony.

—Fire Brick and Blocks.—

The manufacture of this kind of material about Melbourne is confined to one yard, situated in the suburb of South Yarra, within two miles of the center of the city. Here for the last twenty-five years a small patch of fire clay has been worked, and is now in the hands of a company known as the Australian Gas Retort and Fire Brick Company.

The clay occurs at a depth of about fifteen feet below the surface. How far it goes down is unknown, as this point has never been tested, the present excavation being only about forty feet deep. The clay is of a pale yellowish gray color, plastic in nature, requiring but little preparation before it is molded. Over it lies a deposit of gray shale, which is found to be very suitable for mixing with the fire clay to give it the required body.

The material is drawn from the pit by a truck running on an inclined tramway, actuated by a wire rope. It is then spread out in a layer in the drying shed, where it remains for



NO. 2. INCLINE TRAMWAY FROM CLAY PIT TO WORKS, Northcote Brick Co.

a time varying from three days to as many weeks, according to the weather and the requirements in the molding shed. It is then put through a dry pan crusher, and afterwards a screen with a mesh of fifty per square inch. From this it is run into the brickmaking machine, which is one with a horizontal side cut, of the Johnston type, made in the colony. A horizontal pug

mill delivers the clay on to the table, where it is cut by the wire frame into six bricks at a time. The capacity of the machine is 12,000 per day. The green bricks are then stacked in the drying shed and left there for a time, the length of which depends on the weather. This drying shed is rather a noteworthy feature of the establishment, being four hundred feet in length.



NO. 3. DRY SHED, Austin Gas Retort & Fire Brick Co's Works.

An attempt has been made to give a view of it (see photo No. 3), but the light was not sufficiently good to obtain a satisfactory result. In the foreground the clay from the pit is seen spread out to dry; on the left a glimpse is obtained of the brick machine, while in that part of the shed beyond the figures the green brick are stacked. When the brick are sufficiently dry they are put through a hand press and turned out clean and true, after which they are taken to the kiln.

There are three of these of similar construction, side by side in a shed. They are down-draft, fired from four openings on each side. The heat passes up the interior walls in flues carried half way up, and then, passing over the inside of the crown, is drawn down through the green brick into flues beneath the floor connected with one chimney shaft, which serves the three kilns. An exterior view of the kiln shed and chimney is given in photo No. 4.

When stacked in the kiln the brick are first steamed, coke being used as fuel, the operation lasting about four days. They are then burned for about seventy-five hours with Newcastle coal. The temperature required is considerably higher than for ordinary brick, so, as a natural consequence, there is a greater consumption of fuel. About sixteen tons are required to burn a kiln with a capacity of 30,000 brick.

The fire brick produced by the company are of good quality, and they bring from \$25 to \$30 per thousand in the market. At present the output of brick does not exceed 8,000 per day. This, with the plant available, could readily be doubled if the demand warranted it.

As well as fire brick, which are made in every form and size, fire tiles, backs for register grates, muffles for assayers and retorts for gas works are also made. After brick, the gas retort manufacture is the most important branch.

These retorts are built up round a core by hand. They vary in size, going up to nine feet in length by three feet or more in diameter, being round, oval or triangular in section. They are worth on the average about \$3.40 per lineal foot, and are reckoned to last in work about three years.

Fire clay mortar is also made in considerable quantity. It is

used for building up fire brick and blocks in furnaces, for which purpose ordinary mortar would be useless. It is made by grinding thoroughly the same clay used for the brick, after being well dried. It is then passed through a fine sieve and bagged, when it is ready for sale.

As well as the kiln shed and the drying shed, there is an-



No. 4. KILN SHED, Austin Gas Retort and Fire Brick Co's Works.

other large building, in which the molding is done. Part of this is utilized for artificial drying. A long length is floored with brick, beneath which are flues leading from furnaces at one end to a chimney at the other. In this way any required heat can be maintained, and the brick or block stacked upon the floor can be speedily dried for the kiln when necessary to meet sudden demands or larger orders. Not only does the company supply Victoria, but it exports its wares to the neighboring colonies.

The exports and imports of the fire brick just about balance one another. There is a duty of 20 per cent. on all imports of such material; this and the freight practically put the business for the colony into the hands of the colonial manufacturers for all the ordinary items. It is only in special lines, where the articles are small and costly, such as muffles, that the English makers can compete, and even in this line, though perhaps the work of the colonial maker is not in quality up to the standard of the English maker, the former, being able to produce a cheaper article, gets a large share of the business.

The manager of the Australian Gas Retort and Fire Brick Company, Mr. A. Hughes, confidently looks forward to an early revival of trade, and is now busily preparing the ground with a view to working the clay to a much greater depth than has heretofore been attempted, fully anticipating that the quality will improve as the depth increases.

With its compact plant and its convenient site, and almost a monopoly of this branch of the business, the company should be able to give a good account of itself when things take the turn which every one is looking forward to in the immediate future.

—A New Australian Brick Press.—

Naylor & Williams's patent semi-plastic brick press is a machine of Victorian design and construction. As it has only recently been introduced to public notice, it has not yet received any lengthened trials, but the brickmakers who have the machine give it a good name. The two photographs which accompany this show the two sizes made. No. 5 being a back view of the two-mold machine and No. 6 a front view of the four-mold machine.

The molding tables are rectangular, and receive a reciprocating motion from a crank and connecting rod on a vertical shaft. This shaft also carries a cam, working the levers which lift the brick from the molds. When so lifted, these rest upon a fixed table between the molding table and the presses, under

which they are pushed by the molded brick which follow. The molds and presses are fitted with movable steel faces, which, when worn, can be replaced at small cost.

In order to prevent, as far as possible, breakage of the vital parts, the vertical intermediate shafts are coupled and secured by bolts of such a diameter that they would shear in event of an accident and save the important and costly parts of the machine from damage. They appear to be strong and compact machines, occupying comparatively small floor space. The larger one has a capacity of 3,000 brick per hour and the smaller one 1,800, the power required being 25-horse-power and 15-horse-power, respectively.

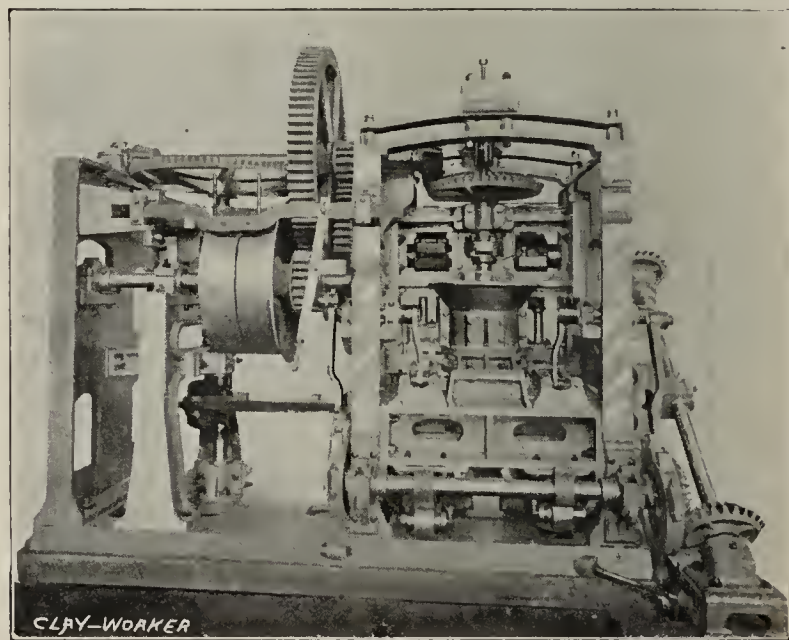
The brick turned out are of excellent quality. The architect of the large building recently erected here for the Equitable Assurance Society of New York speaks in high terms of them. Were things a little brisker in the building trade the machines would no doubt command a ready sale, but just at present most of the brick factories find it difficult to keep the machines they have in use going, and are not disposed, therefore, to purchase new plants. The makers, Messrs. Jacques Bros., of Richmond, Melbourne, have succeeded in turning out work of which they have no cause to be ashamed.

AVANTURINE GLAZE FOR FAIENCE AND PORCELAIN.

A PROFESSOR in the National Technological School at Buda Pesth, L. Petrick, has obtained oxide of iron by artificial crystallization in the following manner: He fuses together anhydrous sulphate of iron and chloride of sodium, and then drenches the product of the fusion a grande eau, and the residuum after drenching is none other than oxide of iron crystallized, in microscopic crystals $\frac{1}{2}$ mm. in size. As these crystals are difficult to fuse in the glazes of the faience potters, the latter, by mixing them with enamel, and by subjecting them to the action of the kiln, obtain the avanturine enamel which characterizes the products of the American Rookwood Pottery Company.

This crystallized oxide of iron, when added in however small quantities to the ordinary faience glaze, makes that glaze dull and hard to fuse. It is more readily incorporated with enamels with a lead base, and then gives that beautiful warm tone of the avanturine wares of America.

Professor Petrick has used this crystallized oxide on faience



No. 5. BACK VIEW.

in two ways: First, with faience glaze, mixed with the crystallized oxide of iron; then, to obtain brilliancy and transparency, with a more fusible and more transparent enamel with a lead base, giving a yellowish brown shade. By producing local designs upon biscuit with the enamel containing the crystallized

oxide of iron, or by leaving certain spots uncovered with this same glaze, and then covering them with the diaphanous lead enamel, he obtained avanturine designs, which, on first examination, were declared to be entirely accidental.

By fusing dichromate (and chromate of potassium and chloride of sodium) he obtained a crystallized oxide of chrome, admirably imitating the chromiferous avanturine. Unfortunately, this oxide of chromium dissolves readily and is changed to chromic acid, and Professor Petrick was thus obliged to look for some other method for imitating the chromed avanturine. He solved this problem by covering the first glaze containing the crystallized oxide of iron with a cupro-plumbiferous enamel, and thus obtained a perfect imitation of the chromed avanturine.—*Dentsch. Chem. Zeitung.*

Written for the CLAY-WORKER.

THE BRICKMAKERS GRAVEYARD.

BY D. W. STOOKEY.

IT WOULD BE INTERESTING to those who visit graveyards if they could read upon the tombstones the cause of the death of those who lie beneath. In the cases of those who died violent deaths the verdict of the coroner's jury could be known by the inscription on the monument. It has been said that there are no good Indians excepting dead Indians, and one would infer from the epitaphs to be seen in cemeteries that all the dead were good people. If we believe the gossips we are driven to the conclusion that all the living are "rotten to the core."

Now, this is not fair; it is unjust, unkind. If we are to lie about somebody, let it be the living, so that they may have a chance to prove an alibi. When we tell lies about dead men we do not give them a fair show. A man who has lived a life of cussedness, and done it intentionally and openly, should not be accused, after he has gone, of doing good deeds in the world that he never did, and deliberately refused to do when he had a chance.

Imagine, if you can, that you stand by the two by six clay bank of some machine agent who had deceived you, lied to you, cheated you by selling you a balky machine that lost you money from the time you first left your work to talk to him until you had its remains laid away in the graveyard and your old machine at work again. Imagine, I say, if you can, that you stand by his pit and see a beautiful terra cotta monument, ornamented with figures of clasped hands, a lamb and a broken twig, and a pretty verse praising his good qualities—that you know he should have had, but didn't. You will stand and weep, not because he has gone, but because the world holds back the commendations from you that your lonely heart yearns so much for. You study the figures in relief, and relief comes to your swelling soul. You look at the clasped hands, and remember how you put your hand in his the first time he came to you; you meditate upon the lamb, and know that the lying and the lamb are lying down close together; you contemplate the broken twig, and are reminded that you have been broke ever since you bought his machine.

Near by we find the monument of a brickmaker. He bought machines subject to trial, treated them unfairly when trying them, declared they did not do as they were guaranteed to, and refused to pay for them. Finally, he settled with the machine man, whom he had worried nearly to death, by paying much less than the stipulated price, and kept the machine. It was what he wanted, but he was too hard, dense, close, vitrified, to pay a fair price for it.

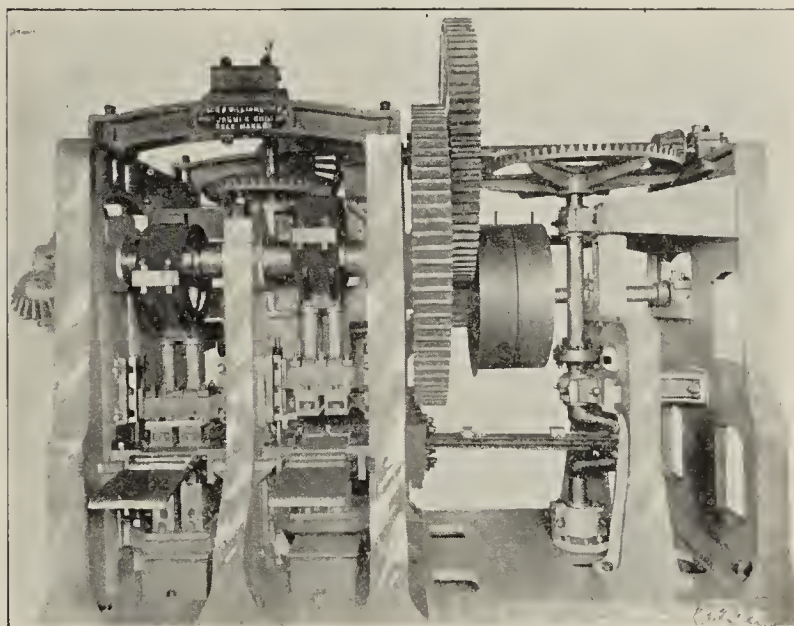
Let us look again. We see the last resting place of one of those faithful, upright, honest, meek, self-sacrificing ones, who loved his fellow-men. The monuments indicate no difference

in their lives. Here, methinks, I see the origin of the expression, "monumental liars." Here is rank injustice. When, O! when, will fashion cease teaching that death makes all alike, that simply because some rogue dies, which is no more than he should do, his sins should all be forgotten!

But to return to the brickmaker's graveyard. Here we find the reverse, and are led to believe that all who lie here were bad. Again, I say, here is rank injustice. If we could read why each silent settler is here we would learn of many violent deaths, murders. One was choked, one starved, one died from taking improperly prepared food, one from neglect, one from alcoholism (of the attendant), one from constitutional weakness, one from a natural deformity, one from unfavorable surroundings, and one was run over.

—Like Other Cemeteries.—

The brickmaker's graveyard, like all cemeteries, is a sad reminder of lost hopes, buried opportunities and blasted aspirations, but, fortunately, nature has blessed man with a wonderful elasticity. The finger of time writes new inscriptions over the tablets of our memories. Nature, with wonderful powers of recuperation, heals all wounds and seldom leaves a scar. The changing scenes of the busy present come between our



NO. 6. FRONT VIEW.

eyes and the shattered images of the past, and, by their greater brilliancy, detract our minds from things that have past and irrevocably gone. It is right that we should turn from the past to the present, and anticipate the future. It is not mete that we should mope and sacrifice the present to the past, the living to the dead. The poet lauds hope beautifully when he says:

"Hope springs eternal in the human breast:
Man never is, but always to be blest."

Unfortunately, hopes, opportunities and aspirations are not all that is lying in fragments in the brickmaker's graveyard. There is a lot of cold cash there that moth nor rust cannot corrupt; that no hyena can ever exhume, no ghoul devour, no body-snatcher carry away, and upon which the awakening blasts of Gabriel's trumpet will fall unheeded. Here, indeed, is an instance in which death ends all, in which there is no resurrection, no future state; here the sting of death is fatal, and the grave triumphantly shouts, "Victory!"

Knowing, then, that all who enter this inclosure have passed that bourne from whence no wanderer e'er returns, it behooves us to be ever on the watch to save all that is possible from passing those gates that never swing outward.

The following inscription which Dante saw, "over a portal's lofty arch inscrib'd," as he "entered on the deep and woody way" that leads down to hell, might appropriately be

inscribed over the entrance to the brickmaker's graveyard:

"Eternal I endure.

All hope abandon ye who enter here."

Many have been brought to the brickmaker's graveyard through causes that might have been avoided, such as neglect, ignorance and accident. As accidents can always be traced to either neglect or ignorance, it is only necessary to give intelligent attention in order that accidents may be avoided. Strict attention to business is a maxim that is essential to success in all departments of life.

Ignorance is an impassable gulf fixed between man born on this earth and that success which is coveted by all.

He who would avoid the heavy tax imposed by the graveyard must vigilantly watch the details of his business with a trained eye, supplemented by a cultured brain.

—Apology.—

The writer in this paper hopes to point out some of the influences that have contributed to the large collections that may be found in the brickmakers' graveyards all over the country. Not that he wishes to set himself up as an adviser, but only to "stir up your pure minds by way of remembrance."

The greatest value of trade journals is not to be found in the new things which they bring before their readers from time to time, but in the constant repetition of things already known, but which are apt to be neglected or overlooked. "Line upon line and precept upon precept," with frequent reviews, are just as valuable for older students as for children in the schools. Possibly no new ideas will be found here, but probably many will recognize in the following descriptions the form which the grim monster took upon himself when he came and bore away their "dear" ones. With these forms portrayed, others may recognize him as he approaches, and, being forewarned, may be forearmed.

—Enlargement of the Brain.—

The unbounded faith that some men have in their own judgment has placed many "remains" in brickmakers' graveyards. Often a man conceives the idea of adopting a new method or of introducing a new department into his plant. He studies the matter over for a time, and decides that certain machines are just what he wants. Instead of consulting others or taking the machinery on trial, he is so confident that his judgment is faultless that he drives a close bargain and buys the machinery for cash. After an expensive and vexatious season of experimenting, he is finally compelled to acknowledge to himself that his judgment was faulty. But what can he do? The scheme will not work, and necessarily must be abandoned. The machinery is his. He bought it and paid cash for it. He asked nobody's opinion and has nobody to blame but himself. It is of no use to him, for the plan is not practicable, and he must either sacrifice it as second-hand for what he can get or have it standing around mocking him and constantly reminding him that "experience keeps a dear school, but fools will learn in no other."

(To be continued.)

THE SIMPSON DRY PRESS.

FOR BUSINESS REASONS manufacturers are sometimes wont to make a resume of past business and gauge their estimates on future sales by inquiries to hand. However, it is often the case, especially after experiencing the severe depression of the past year, for manufacturers to abandon any idea of publishing a "statement of sales," for the very good and simple reason that they haven't had any, or perhaps so little that they have handled it at a loss.

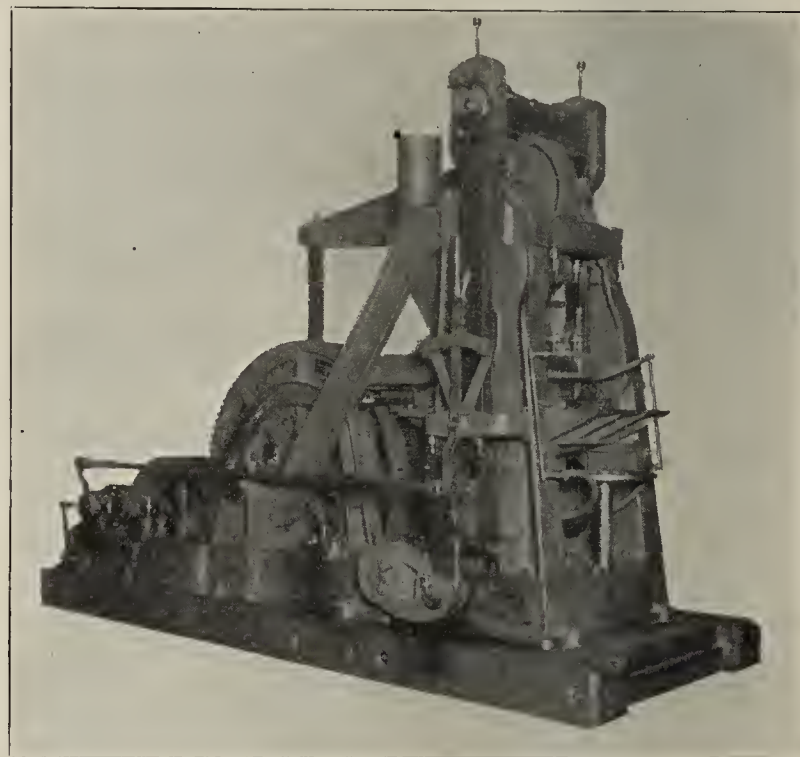
For concerns introducing new ideas in machinery the past two years have been exceptionally hard ones. The turbulence of the times have induced investors to be cautious, and rather than put their money into a new and untried thing they preferred established articles that others had tried and not found wanting. Their money was in good hard dollars, and they

wanted something sure, and they knew they were receiving an equivalent.

This is particularly true in brick machinery, and those manufacturers who have an established reputation experienced only a slight lull in their business, which at the most can only be temporary. The public interested in their particular line knew what they had, and a good thing always sells itself, and its past record always redounds to its credit with prospective customers. A notable instance of this success is the Simpson brick press, the oldest dry press machine being manufactured, and which is used by the large majority of pressed brick manufacturers.

The fame of this press is not confined to the United States, as in Canada also it has gained a prestige nothing short of phenomenal. Ninety per cent. of the pressed brick manufactured in that country are made on the Simpson press. Again, mechanical experts sent from Europe especially to investigate American brick machinery and manufacturing methods have always reported in favor of the "Simpson." It is running in European countries, and anybody interested can secure the address of its European users.

In view of this wonderful success, it would seem very unlikely that the manufacturers of the machine would adopt a



SIMPSON'S NEW DRY PRESS.

new design. However, such is the case, and they now have a press that can be justly called the "standard of the world." It embodies the same primary principles and points of advantage contained in the old machine, together with many new ones.

The Simpson Brick Press Company, of Chicago, manufacturers of the press, have nearly completed a large factory, where they will not only manufacture the "Simpson," but also a full line of clayworking machinery of every description.

Write them for list of new yards started recently, and also where their machinery has been running for years. They have a list comprising hundreds of names.

HAD TO COME TO DETROIT.

Through their London office, the American Blower Company received yesterday an order for dry kiln apparatus from the Stora Kopparbergs Bergslags Aktiebolag, of Falun, Sweden, which will take at least two carloads of machinery from Detroit, and the dry kiln plant equipped will be without exception the largest in Europe. The above mentioned concern with the long name is the most important of the kind in the old country. It has been investigating dry kilns the world over for the past four years, and the final outcome is a matter of considerable gratification to the American Blower Company.

A NEW CLAY AND ROCK CRUSHER.

JOHN J. MORONEY HONORED.

Appointed Clay Expert of the Field Columbian Museum.

WE ARE ENABLED to present this month a sectional illustration of the Champion steel rock crusher, offered by the Chambers Brothers Company, of Philadelphia. While designed originally for crushing rock for road ballast, etc., the machine has found a very useful service on many brick plants in crushing hard fire clays, burned fire-brick bats and vitrified waste material from the kilns. Brick manufacturers using shales in which are lumps of exceedingly hard rock which they would like reduced before feeding it into their dry pans will find in the Chambers rock crusher a most valuable machine. The main frame of these machines is made of rolled steel plate, and they are practically unbreakable. They are of good mechanical construction and guaranteed to give satisfaction. The Messrs. Chambers have two sizes ready for prompt delivery, and will give further particulars on application.

The World's Fair left in its wake a few permanent institutions of learning, one of the most important being the Field Columbian Museum. Richly endowed by the gentleman whose name it bears, it is destined to shed much luster upon Chicago. Its managers are practical business men who seek to direct its affairs along lines that will make it utilitarian in character. To this end they are selecting experts to manage the various departments, and in the clay line have appointed Mr. John J. Moroney a special representative, whose duty it will be to collect samples of the best and most characteristic clays from all sections of the country and furnish the Museum with an exhibit of each, consisting of a small burned brick, a small green brick, a sample of the raw product, just as it comes from the

GERMAN QUALIFICATIONS OF GOOD BRICK.

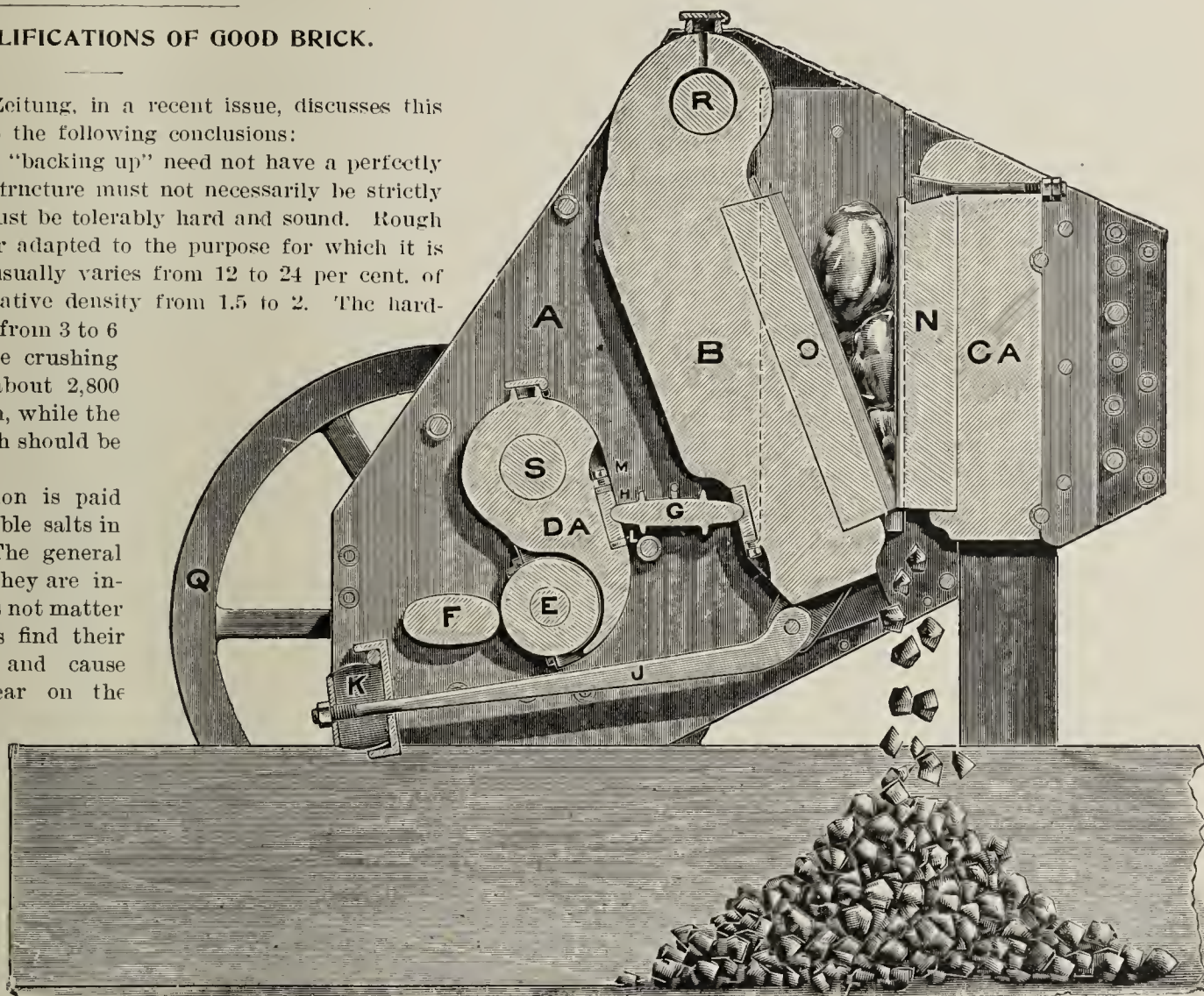
The Thonindustrie-Zeitung, in a recent issue, discusses this question, and comes to the following conclusions:

A common brick for "backing up" need not have a perfectly regular form, and its structure must not necessarily be strictly homogeneous, but it must be tolerably hard and sound. Rough surfaces make it better adapted to the purpose for which it is used. Its absorption usually varies from 12 to 24 per cent. of the dry weight, its relative density from 1.5 to 2. The hardness may be anything from 3 to 6 on Mohs's scale. The crushing strength required is about 2,800 pounds per square inch, while the cross breaking strength should be 850 pounds.

Not enough attention is paid to the presence of soluble salts in the common brick. The general belief is that because they are inside of the wall it does not matter but often these salts find their way to the outside and cause efflorescences to appear on the front brick. Comparatively small quantities of magnesia, potash and soda, as sulphates, may cause trouble in this respect, while sulphate of lime, on account of its greater insolubility, must be present in larger quantities in order to give rise to whitewash. More than 0.5 per cent. of soluble salts should not be allowed in common brick.

A front brick should have an absorption ranging from 4 to 10 per cent. Its hardness may vary from 6 to 7, its relative density from 1.9 to 2, the crushing strength from 4,200 to 7,000 pounds per square inch and the cross-breaking strength from 980 to 1,600 pounds.

The paving and sewer brick should have an absorption of about 5 per cent., a hardness of from 8 to 9 and a relative density from 2 to 2.4, and the crushing strength should not be less than 6,300 pounds per square inch. The author thinks that, next to low absorption, toughness is the greatest factor for paving material, a quality which has been somewhat neglected by the German road builders, who lay too much stress on hardness.



CHAMBERS BROS. CO'S CHAMPION STEEL ROCK CRUSHER.

bank, and a sample of the same ground or prepared as used for making brick. Each clay will be placed in a tray by itself and properly labeled. The Museum expects this collection to be a great addition to their geological section. In order to facilitate Mr. Moroney in this work the Director of the Museum has issued the following proclamation to the brickmakers of America:

"Mr. John J. Moroney, representing the Chicago Brick Machinery Company, has kindly consented to collect specimens of clay for the collections in economic geology in this institution. Any favors that may be shown him in this work will be appreciated by the Museum.

F. F. V. SKIFF,

"Director Field Columbian Museum."

Mr. Moroney is specially fitted for this work, having probably had as much experience in the testing of clays as any one in the country, and is acquainted with the deposits in every State in the Union and their different peculiarities.

Written for the CLAY-WORKER.

FIRST MEETING OF THE COMMITTEE ON TECHNICAL INVESTIGATION.



COMMITTEE ON TECHNICAL INVESTIGATION, notice of whose appointment appeared in the March issue of the Clay-Worker, met at Columbus, on the 7th of April, in response to a call issued by the Chairman soon after the appointments had been announced. The purpose of the meet-

ing was to enter into negotiations with the Board of Trustees of the Ohio State University, in accordance with Section 3 of the Richardson resolutions, under which the committee had been appointed.

The members in attendance were: D. V. Purington, of Chicago; W. D. Richardson, of Shawnee, O., and Edward Orton, Jr., of Columbus. Messrs. Ittner, of St. Louis, and Bloomfield, of New York, had both made all arrangements to come, but were detained at the last minute, and were obliged to send messages to that effect. In addition, the Chairman had asked a few other gentlemen to come on and participate in the meeting in order to get the benefit of their counsel. Of the four or five so invited, two responded with their presence, namely, Messrs. Randall and Gates. Letters were received from President Brush and ex-President Eggers, of Cleveland, expressing their regret at not being able to be present.

During the morning hours an informal meeting was had, and the proposition which the committee was to present to the board was first discussed, and, after a good deal of adjustment, was satisfactorily framed. The policy of the committee in event of unsatisfactory negotiations was also discussed, as well as plans for the execution of the work in event of the acceptance by the board of their part of the trust.

For lunch the committee and their friends adjourned to the Columbus Club, where they were delightfully entertained by L. E. Kilbourne, of the Columbus Brick and Terra Cotta Company, a member of the N. B. M. A. of many years' standing.

The joint meeting of the two bodies had been arranged for 2:30 p. m., and took place soon after that time in the office of the board. The brickmakers were invited to present their case, which they did very completely, though briefly.

T. A. Randall led off with a five-minute talk on the N. B. M. A., what it is, how its organization is kept up, what its purposes are, and to what extent it is fulfilling them.

W. D. Richardson followed in a ringing speech of five minutes, setting forth the need of more accurate work and scientific means of research in settlement of the great number of problems which discussion in the Conventions of the N. B. M. A. has brought out and clearly defined, but which have not and cannot be settled by discussion alone. This, he stated, the N. B. M. A. wish to do through the scholarship proposed. But, while their first object is their own advancement and growth in knowledge, the N. B. M. A. has other objects in view. It had promised four years ago its material and moral support to the first school which should open its doors to the industry, and it is time, he said, that it should keep its word. Also, it is alive to the great opportunity which the expenditure of this small sum will open to some poor but ambitious boy to obtain a thorough foundation in the sciences which contribute to make clayworking an art instead of drudgery.

D. V. Purington then gave a clear and concise statement of just what the N. B. M. A. had empowered their committee to offer the board, and in return just what responsibility they expected the board to assume. This matter is best reported in the language of the proposition itself:

—Proposition for the Establishment of a Scholarship in Ceramics in the Ohio State University, Presented by the N. B. M. A.—

The National Brick Manufacturers' Association hereby offers to present the sum of two hundred and fifty dollars (\$250) for the establishment of a scholarship in the Department of Ceramics of the Ohio State University for one year. The committee of the Association to whom this matter has been intrusted propose to place this sum in the hands of the Trustees of the University under the following conditions:

First—That two hundred dollars (\$200) of this sum shall be paid to the student selected by the N. B. M. A. as the recipient of this scholarship, to be used by him in defraying his necessary living expenses, to be paid to said student in ten equal installments.

Second—That the Ohio State University shall contribute one hundred dollars (\$100), which, with the unexpended fifty dollars (\$50) of the N. B. M. A. fund, shall be reserved for paying the official expenses of the student in the way of fees, dues and supplies, and also general expenses for material and apparatus needed in the prosecution of the experimental work of the scholarship.

Third—That one-half of the time of the recipient of this scholarship shall be at the disposition of the Director of the Department of Ceramics; the other half shall be at the disposition of the student himself, to be used in the prosecution of whatever studies he may elect.

After reading this proposition, Mr. Purington went on to give a very brief account of the work already done by the Department of Ceramics, in conjunction with the Testing Committee of the N. B. M. A., and stated that the desire to maintain and increase this kind of investigation was the motive which led the N. B. M. A. to make these overtures.

Mr. W. D. Gates then took up the thread of the story, and told something of the results of the training given by the department. He mentioned the fact that he had taken one of the first class at the conclusion of his two years' course and had put him at work in his factory laboratory. He stated that he had given satisfaction from the first, and that he had not only made great progress personally, but that the works had also made technical gains from his labors, and that he had been twice promoted in six months. In conclusion, he stated that his confidence in the training was such that he had sent his own son to take the course, and that the latter was now enrolled among the scholars of the department.

Professor Orton gave a few closing remarks, setting forth the applicability of the scheme proposed to the regular working conditions of the department. He showed that the arrangement would be of the very greatest value to the University, as well as the Association, and also to the fortunate student who should win the appointment.

After the committee had presented its case the board asked questions for a few moments to satisfy themselves as to minor points of the scheme proposed, and then adopted the following resolution, presented by Hon. D. M. Massie:

"Resolved, That the Trustees of the Ohio State University highly appreciate the public spirited proposition of the National Brick Manufacturers' Association, and hereby gladly accept the same, and pledge themselves to carry out faithfully the trust thereby committed to them."

After a few minutes spent in pleasant social conversation the committee withdrew to their hotel, and, after discussion, adopted the following circulars, setting forth the necessary explanation as to how the machinery of the scholarship should be set in motion, both as to the selection of the recipient of the scholarship and the selection of the work which he should undertake. In regard to the selection of the man, the following circular was adopted as furnishing the necessary information for the guidance of any candidates:

—A Free Scholarship in Clayworking and Ceramics.—

1. A paid scholarship, to be known as the "National Brick Manufacturers' Scholarship," will be established in the Ceramic Department of the Ohio State University for one year, beginning Sept. 15, 1897, and ending June 15, 1898.

2. The recipient of this scholarship will receive the sum of two hundred dollars (\$200) per annum, paid in ten monthly installments, as compensation for his services.

In addition to the money actually paid him, all fees, dues, laboratory expenses, chemical supplies and other official expenses will be paid from the funds of the scholarship.

Further, one-half of the time of the student will be at his own disposition, provided only that it shall be used in the prosecution of such studies in the University curriculum as he may elect and be able to maintain.

3. In return for these advantages and emoluments the recipient shall give one-half of his time for each week day of the

college year to such work as the Director of the department shall indicate. The duties will consist of experimental investigations into some problem of the clay industries to be designated by the committee and superintended by the Director of the department.

4. The selection of the recipient of this scholarship from the various candidates shall be by competitive examination, in which the following factors and weightings will be taken into consideration:

A—Scholarship (by written examination)..... 85 per cent.
B—Practical experience in the clay industries..... 10 per cent.
C—Special adaptation to the position..... 5 per cent.

100 per cent.

No candidate will be eligible for examination unless he is either personally known to some member of the committee or can bring a certificate of good moral character from some person in authority at his home.

A—The written examination, which is the principal determining factor in the contest, will be conducted upon the following subjects and with the following weightings:

Subject.	Weighting.	Remarks.
English.	5	No formal examination will be held in English, but all the papers presented on other subjects will be criticised in reference to their correct use of the language.
Algebra.	7	Through Quadratics. Text book used in examination, Wentworth's.
Geometry.	3	First three books, Plain Geometry. Text book used in examination, Wentworth's.
Physics.	15	Text book used in examination, Carhart & Chute. Gage, Appleton, or Havery, are fair equivalents.
Elementary Chemistry.	15	Text book used in Examination; Remsen's "Introduction to the Study of Chemistry."
Qualitative Chemical Analysis.	10	Text book used in examination; W. A. Noyes, "Qualitative Analysis." Examination will consist of actual analysis of one unknown body, giving written statement of methods and reactions.
Quantitative Chemical Analysis.	15	Text books used in examination: N. W. Lord's "Notes on Metallurgical Analysis," and "Thorpe's Chemical Problems." Also, Note books showing actual work on quantitative analysis done by student must be submitted.
Geology.	5	Text books used in examination: LeConte's, "Elements of Geology" (smaller edition), "Tarr's Economic Geology," Part two.
German.	7	Examination will consist of one-half hours trial at translation from "Die Thonindustrie Zeitung." Each candidate will be supplied with lexicon during trial.
Mechanical Drawing.	3	Candidates must submit at least 5 plates or drawings made by himself.
Ceramics.	15	Candidates having had course in Ohio State University, will be examined on work as taught there. Candidates not having had this course will be examined on the following, as equivalents: "Laugenbecks Chemistry of Pottery." "Zwicks." "Ziegelthone."
	100	

B—The grading of applicants on their previous experience will be based on the answers given to the following questions:

First—Name the branch or branches of clayworking in which you have had practical experience, giving the names of the companies or firms by whom you have been employed. (Brick-making, sewer-pipe making, pottery making, etc.)

Second—Give the time spent in the active pursuit of each branch.

Third—State in what capacity you were employed or if you were employed in more than one capacity; give the various positions occupied and approximately the period in each, and the responsibility devolving on you. (Whether laborer, foreman, burner, clerk, etc.)

C—The third section of the examination, on which a possible grading of 5 will be allowed, is really only designed to guide the committee in case two young men of approximately equal acquirements as scholars and with approximately equal experience in practical work should contest for the appointment.

In this case, the committee will endeavor to determine by actual contact with the applicants that one who is most favored by nature and experience for the work to be undertaken during his period of incumbency. The committee regards it unlikely that any such contingency will arise, and expects that the written examination and past experience of each applicant will suffice to grade him properly.

5. The examination will begin on Monday, the 14th of June, 1897, at 9 a. m., at Orton Hall, Ohio State University, Columbus, O. Each applicant must be present in person. No other

examination will be held, and intending candidates must be there on time.

For any further information apply to Prof. Edward Orton, Jr., Ohio State University, Columbus, O.

The committee next took up the matter of selecting a proper subject on which to apply this new implement of investigation. According to Section 5 of the Richardson resolutions, the selection of the problem on which the work of the scholarship shall be placed is to be left to a vote of the members of the Association, to be held prior to July 1.

The committee, in furtherance of the intent of this plan, suggest the following questions as being ones which admit of laboratory treatment, while many other interesting problems met by the brick manufacturer do not. Also, the committee suggests that all votes or suggestions shall be sent to the Secretary of the Association before June 10, instead of July 1, so that the result of the vote can be ascertained in time to use the knowledge in selecting the student for the scholarship at the examination in the week following. It will be understood by all that the committee does not wish to prevent any one from filing his vote in favor of any other problem in which he is more interested than these given, but the following suggestions are made purely with a view to securing some decisive selection:

1. Investigation to determine the effect of structure on the wearing power of paving brick.

This work would be a continuation of the results presented at Buffalo, but would include, also, tests of bricks made by all processes and from a large variety of clays, so that it could not be open to the same objection of insufficiency or inconclusiveness.

2. Investigation to determine the relation between hardness and frost resistance in burnt clay wares.

This investigation would attempt to show at what degree of burning the best physical structure of clay is developed, and also what effect the method of manufacture would have on the necessary hardness to resist frost.

3. Investigation to determine the causes and prevention of efflorescences during drying and watersmoking of clay wares.

This investigation would not attempt to deal with efflorescences appearing after burning or use in construction, as these are not altogether due to the same causes and cannot be successfully treated by the same means. They would properly form the subject of a second year's experimental work.

4. Investigation into the relation between a clay's physical and chemical properties and its speed and safety in drying.

This work would be prosecuted with a view to explaining the differences which clays exhibit in drying and as an aid to finding out the proper method of drying in advance.

Address all replies designed for the selection of the work to be undertaken to the Secretary, T. A. Randall, Indianapolis, and all matter relative to application for examination to Prof. E. Orton, Jr., Columbus.

The work of the committee being finished in so far as all preliminary arrangements were concerned, they adjourned subject to call of the Chairman. A visit to the University then filled the remainder of a busy day, and during the evening the members scattered to their respective homes.

Written for the CLAY-WORKER.

THE NEW YORK MARKET.



PRIL 1.—Will or will there not be any brick made by the time this issue of the Clay-Worker is distributed among its many readers is a question. There does not seem to be any one who will venture an opinion. Of course, there will be a few yards which will begin, but the majority seem to be inclined to wait till at least the weather becomes settled, as the outlook certainly does not call for an early and increased production of brick. Last year at this time the puff of the pumping engine could be heard on all yards; to-day nothing is being done.

The month of March is generally a busy month for the blacksmith and wheelwright who have shops near the yards, repairing trucks, wheelbarrows and carts for the coming season. This season not a single yard has sent an article to be repaired; not that they do not require to be put in order or that the manufacturers are putting off the day as long as possible so that the bill will not come in, but simply that they do not intend to have anything overhauled but what is really necessary to be done. The state of the business does not warrant the expenditure, although the different articles on the yard require repairing. It is one of the straws which show conclu-

sively that low prices are getting in their fine work. How much longer it will last is not known. Of one point it is quite certain: the trade will not reach the demand that will call for eight-dollar rates very soon, as the productive capacity will hold rates back.

One of our town papers, the past week, informed its readers that brick were selling below cost in Paterson, which is only seven miles from Hackensack, and consumes a number of brick from that place. Like many other papers, it knows what is going on in other places, but is silent about prices in its own locality. The below-cost rate has existed in Hackensack for some time, without any visible increase of building. A few years ago, when the price, delivered in town, was \$8 per thousand, the demand was good, but the cry was, "You charge too much for brick; if you would sell them at a reasonable figure you would more than make the difference in the call for more stock." Well, if the price of to-day is not low enough, it would be a hard matter to satisfy the public in rates, as brick are being delivered through the town for \$4.50 and lower, and there is not one house being erected for every ten at the high rate of brick. The other fellow who sells brick so low should be driven out of the trade, is the remark heard from some of the brickmakers. The same parties were the first to cut or do anything in the way of accommodating the builder, by signing release on building or taking notes so as to get the trade. When, like the crows coming home, it has come to them, they make a great cry because it hurts them financially.

A few days past several of the manufacturers were talking about the condition of the home trade, with the risk that was

shipped. It will cost about 40 cents per thousand more, which requires quite an advance to place them on an even grade with the others. Last fall the matter was discussed among the manufacturers as regarded the advisability of doing it in the then state of the market, with a general opinion that it would prove a losing speculation. It was the judgment of the manufacturer that he would have more stock on hand, and the spring rates would be so much higher and he would be ahead.

On the 1st of January there were 8,000,000 brick under the shed of that yard; navigation was opened a month before a boat was loaded for the New York market. At present writing there are but four, out of the six vessels which carry the brick, running, and those the smallest cargo carriers, with the men who are in charge of the yards out east, at Providence, Newport and Fall River, trying to sell stock, with a prospect that there will be but two machines running on the yard, and no certainty as to the time of starting, possibly in June. Such "foresight" has in the past pushed more than one concern to the wall. It is a safe rule never to handle brick but once—that is, burned ones—and then when they are shipped; it costs money every time they are touched.

—1896 versus 1897.—

A comparison of the first three months of the past and the present year as to what the brick trade may look for to help swell the demand, as the first quarter of the year is the one in which the largest number of permits are filed in the building department, gives a fair chance to form an opinion of the out-



BRICK WORKS OF WILLIAM CONWAY, Philadelphia.

in it, supplying a job and not knowing whether you would get your money, as there were so many methods now used by contractors to beat the trade. The remark was made that the only safe way was to be paid for your stock at the shed. "Yes," one replied, "it will have to come to that before long." The same man would be the last to enforce that rule for fear that he could not sell his stock. There are a queer lot of business men making brick.

The home rates are low, and some of the manufacturers claim that they will not sell at the rates, and send their stock to market. When the returns come in the result is below home rates. Why not hold them? Echo answers, Why?

The first barge to go to the New York market from Hackensack was sold for \$4 per thousand. How is that for a starter? When freight and commission is taken off, the sum of \$2.75 per thousand remains. Is it possible to replace them at any less figures than the selling price?

—Does It Pay to Pile Out Brick?—

That is, removing brick from shed and stacking them outside to make room to put in other stock. It is still done by some brickmakers, when prices are low, in the hope that there will be advance enough to pay for the trouble. It has always resulted in a loss. One of our yards piled out over a million last fall, or about thirty arches, with the loss of broken brick and arches, as well as the time taken to remove them from the kiln and then pile them off, and again handle them when

look for the use of brick. There are always some who file their plans and may not build in years; there are others who may build that filed their plans last year. As a whole, it is safe to assume the figure may vary but little, unless some factor may arise to set aside some of the largest structures. In New York city, 1896, first quarter, 709 buildings; cost, \$21,785,470. First quarter of 1897, 903 buildings, to cost \$19,342,550, an increase in permits of 114; nothing to give any hope of a boom in sight. On the other hand, a difference of about \$2,000,000 in cost of structures shows that large buildings do not make as good a showing as in the past.

In Brooklyn there is no decided improvement. First quarter of 1896, number of permits, 709, first quarter of 1897, 764, the small number of 55 more in favor of this year. When you compare the cost for 1896 and find that 709 buildings cost \$2,688,548, the same date this year gives 764 buildings, costing \$2,845,502, only \$156,954 more, or less than \$3,000 each on the fifty-five buildings which are to be erected. Certainly brick does not form the main building material in Brooklyn, as the average shows but a trifle over \$3,700 cost per building. As it is iron in New York city, so, in Brooklyn, frame structures count against brick.

—A Strike—

Once more threatens the trade, among the steam fitters and plumbers, at the commencement of the season, looking at the present time as if it would be one of the most far-reaching on

record in the building trade, if, as now threatened by his mightiness, the walking delegate, he should say make it a sympathetic one, and it will compel those who are not in favor of a strike to remain idle, as they will have to wait until the others go to work. The master builders seem determined to control their own business, while the walking delegate says who shall work or who shall not. If the rupture takes place, it will be time enough to make brick in July. What next will have a clp at the brickmakers?

—Death—

Has once more entered the ranks of the brickmakers, in the person of George W. Smith, of Dutchess Junction, N. Y., brother-in-law of Edwin Brockway, Second Vice President of the N. B. M. A. The claim has been made that to be a thorough brickmaker one must learn the trade when a boy. Geo. Smith's first experience in making brick was in 1879, when he formed a partnership with Mr. Brockway in a yard at Haverstraw. He certainly could not have met a more competent instructor in the trade. He was then about twenty-one years of age. After the lease expired he went with Mr. Brockway to Fishkill-on-the-Hudson. About three years ago he leased a piece of property at Dutchess Junction and erected a plant which has the reputation of being one of the most complete yards in that section of the State. He was always found on the yard, giving his personal attention to all details, with the result of making as good a grade of common brick as was placed on the market. At the early age of thirty-nine he fell a victim to paralysis, produced, many think, by too close attention to business.

—The Market—

Is one which has caused many a brickmaker to say, Is it worth while to make brick? The demand is slow; the returns, after freight and commission are taken out, in many cases leave but a small sum, with no prospect of a reduction in the cost to make the coming year. The market moves sometimes one way, then the other, as the following will show: The first week in March showed about fifty barges on the market, eighteen of them holdovers from covered stock of the fall before. The reason more were not in market was that those which had been sold had not been able to unload, so that values shrunk some. Ordinary grades brought \$4.25, with \$4.75 for strictly good, with Jerseys at \$3.50, \$4 and \$4.50.

The second week the stock was reduced some in sellers' hands by the holding back at Haverstraw, as the fall of rates caused a second thought to prevail. Hudson river brick selling for \$4 and \$4.50. The third week fewer arrivals has resulted in a steady market, but no advance. The fourth week a slight reaction by the withholding of shipments, the advance of about 1 shilling per thousand, and in some cases 25 cents is reported. How long it will hold is only a question of freer sending of stock to market. If a four-dollar rate has been reached in March, what will July show?

A. N. OLDTIMER.

GOOD PROSPECTS FOR PHILADELPHIA BRICKMAKERS.

WHEN I STARTED out yesterday, with notebook in hand, a quarter for car fares, a pipe and two ounces of 'baccar.

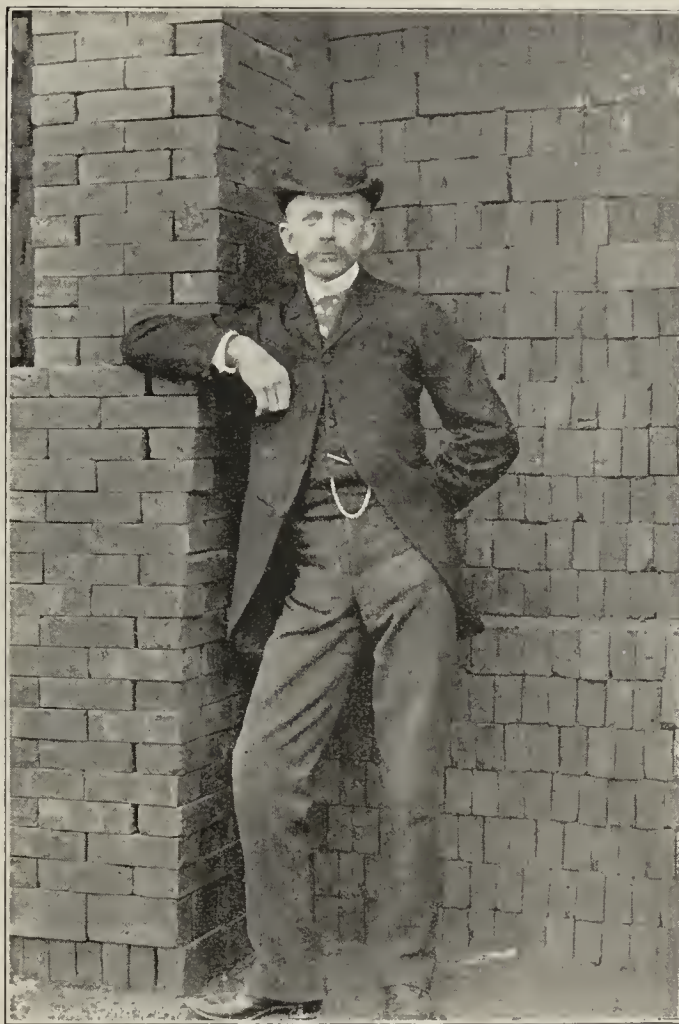
I felt I was all right for three or four brickyards. The first yard I found seemed deserted. I finally run down the clerk, who, in a clean-linen kind of a voice, told me "they hadn't started up yet." If, however, I'd come round in a few days, I might learn something. A two-mile trip up a dusty road brought me to another plant, where I struck another negative—"Ain't started up yet, but expect to very shortly." I ventured to ask whether there had been any suicides of late or any dreadful happenings like explosions, or whether any of the men had fallen into the pugger and been puggered to death. "No," was the response, in a boarding-house-soup kind of a voice, accompanied by a seraphic smile; "no, nothing."

"Well," I conjectured, as I looked down the long vista of dust-hidden cobbles, "things look lively for my next letter in the Clay-Worker."

Remembering a cordial invitation to visit the brick works of Wm. Conway, I took myself away out in West Philadelphia, where, at Fifty-eighth and Walnut streets, the end of a line contiguous to Philadelphia's most aristocratic street, lies the plant of Wm. Conway, with its twenty acres of elevated clay soil, and one of the cleverest and most courteous owners I ever met near a kiln. Together we wandered over the yard, first inspecting the machine shed, where stood the redoubtable Chambers end cut machine, doing its work bravely, turning out 60,000 and 65,000 daily, with a 100-horse-power engine and a 150-horse-

power boiler. In season over 150 hands are employed, and when business is booming nearly 180 find hustling not smart enough. The ten or a dozen hand gangs turn out 22,000 to 25,000 daily. Lying on the south side, the various sheds for the pugger machine and engine room, and the three nine-foot grinders, are kept well together, thus giving the yard a nice sense of good order. And right on the high rising ground to the south of these stand eight large drying sheds. Mr. Conway believes in drying by climatic influence. Midway between the office and the mill shed are thirteen more drying sheds, with good hard bottoms, bearing a top surface like glass. Five ten-arch up-draft kilns, with a capacity of 180,000 each, completes the line to the office, with one twenty-arch kiln, with a capacity of 400,000. Framing this in with a splendidly kept stable for thirty horses, including a couple of pacers with a gait under 2:30, and a pumping station, with a force of 25,000 gallons a minute, this yard was creditable alike to owner and the Association to which he belongs.

Mr. Conway did not start until 1887, and then with hand gangs only. A year later the Chambers machine was introduced, and has been running ever since for seven months of the



WILLIAM CONWAY, Philadelphia.

year, contributing its 10,000,000 to 12,000,000 annually. The great bulk of the brick used in the Philadelphia Bourse came from this yard, also the Reading Terminal, and the contracts on hand for the present 125 two and three-story houses, and 700,000 for the Old Men's Home, at Thirty-ninth and Powelton avenue, make a good opening wedge for the present season.

—Murrell Dobbins's Yard Presents a Scene of Activity.—

Switching off to the southwest, and about three miles from the Builders' Exchange, lies the brickmaking center called the "Neck." The "Neckers" were ever famous in the local history of the Quaker City for truck, coal oil, grain, and, lastly, bricks. Here, interspersed through the various clay stretches, are the brick works of the Jarden Company, the Philadelphia, Mc-Avoys, Lenton, and the above named—Murrell Dobbins, a Director of the Brickmakers' Association, member of the Master Builders' Exchange, occupying offices at the same place, in co-operation with the one at the yard. He is a good sportsman, a strong factor in politics, and business through and through, from the sole of his shoes to the crown of his hat. The whole place seems full of it. As you enter the yard the cloud of up-rising dust signals the approach of trains either in your rear or front. Every man has a hustle on, and darkeys 'ain't got no

time to smoke." On the twenty-five acres of ground stand the Chambers end cut machine, worked right up to its fullest capacity—65,000 daily—and near by the Martin machine, working 32,000. An engine of 150-horse-power and two boilers of 250-horse-power supply the motor power and the drying sheds for



Figures 1, 2 and 3.

the smaller proportion of bricks before they are hacked out to the sun-lit drying sheds. Four hand gangs only are kept, but one hundred men can count on work for an average of eight months in the year, during which time they turn out about 10,000,000, hard stretcher, salmon and pressed; no mottled or fancy bricks are made here. Four covered floors are set out for hand-made bricks and eight large drying sheds for the steam-dried batches. Two seventy-five-foot tempering pits are in the line parallel with the machine room, with sectional drying sheds between them and the machine fanning room. Five ten-arch up-draft Dutch kilns and one twelve-arch up-draft Dutch kiln do the entire work of burning, the former having a capacity of 190,000 to 200,000 each and the latter 260,000. Nine or ten double teams do the hauling, besides single teams; altogether, about twenty-eight horses are in harness during the ten hours of the day.

Murrell Dobbin first started in 1863, but in 1876 he opened up at Long lane and Mifflin street, where he worked hard until the clay gave out in 1893. Very cautiously, however, he opened up the present yard in 1891, and here, as soon as one field gives out, he takes in another. He superintends the yard during the morning, and devotes the afternoon to his office at the Exchange.

W. P. LOCKINGTON.

P. S.—Owing to an error of our correspondent and a typographical omission in our March issue, we failed to give due credit for the terra cotta work done on the recently completed Horticultural Hall of Philadelphia. Both in this and the mammoth Witherspoon Building the terra cotta work was supplied by the Conkling-Armstrong Terra Cotta Company, and not by Stephens & Co. We offer our regrets to the former, and add our congratulations on their success.

RUBBER BELT CONVEYORS.

THE ACCOMPANYING illustration of rubber belt conveyors is one that needs but little explanation. Its simplicity will be apparent at first glance, while its efficiency is demonstrated in the many plants where the same is now in use.

The manufacture of this style of conveyors has been taken



Figure 4.

up by the Jeffrey Manufacturing Company in its work, owing to the broad use which can be made of it in handling material

of many kinds. The special rubber belt and idlers, as shown, are manufactured under the Robbins patents.

Illustrations 1, 2 and 3 show three styles of rubber belt. The trouble heretofore has been to get the proper kind of material in a rubber belt which will stand the wear and tear occasioned by the material falling upon it. This has been brought to a very high degree of perfection in the Robbins belt, and only after long and careful experimenting in practical work.

The reinforced thickness of rubber on the belt insures long life by having the carrying side strengthened where it is mostly needed.

Figure 4 shows the supporting rollers and idlers, which are very simple in construction, and make the erection of this system comparatively inexpensive.

Figure 5 is an illustration of the conveyor as it appears in operation.

This rubber belt system is arranged to deliver the material



Figure 5.

at the terminals or along the line, and is especially desirable in the handling of ores, broken stone, sand, clay, fertilizers, grain, coal, etc.

For catalogue and prices address the Jeffrey Manufacturing Company, at Columbus, New York, Chicago or Denver.

MACON, GA., TO HAVE A PAVING BRICK PLANT.

The paving question is being agitated at Macon, Ga. There is a probability that several miles of paving will be put down on her streets this season. Public sentiment seems to be pretty evenly divided between vitrified brick and asphalt, the former being favored by the Councilmen, owing to its superior wearing qualities. As a result, a project is on foot to establish a paving brick plant in that vicinity. Those who ought to know say there is an abundance of clay there suitable for pavers.

Macon now has a good pressed and common brick plant, owned and operated by J. G. Roan, and an extensive fire brick, drain tile and sewer pipe factory, established years ago by Henry Stevens, the business now being carried on under the firm name of H. Stevens's Sons' Company. W. P. Stevens, the General Manager of the company, and an experienced clay-worker, writes us that he has no doubt but that a superior quality of pavers can be made from their clay. Macon's Mayor, in a recent message to the City Council, recommended that \$600 be appropriated to experiment in making 60,000 vitrified brick, with a view of testing them for street paving. It is Mayor Price's idea to pave the streets with vitrified brick and have them made in Macon, if feasible, so all the money to be expended in paving can be kept at home. His recommendation was adopted.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

OHIO VALLEY NEWS.

ALL THE BRICK and sewer pipe works in this valley, with but two exceptions, are running to their full capacity, and the demand for their products continues good. It has begun to look like old times among the clay industries in this region.

G. B. Boren has resigned his position as General Manager and Treasurer of the Mack Manufacturing Company, of New Cumberland, W. Va., having purchased a large interest in a vitrified brick works at Catskill, N. Y., one of the largest single brick factories in the country, having a capacity of 150,000 brick per day. To fill the vacancy caused by Mr. Boren's resignation the Directors of the company elected A. W. Sewall, the present Secretary, Secretary and Treasurer, and Joseph P. Mack, the President, President and General Manager. Mr. Boren has been an officer of the company for six years, and still retains his large interest in the company.

Negotiations are said to be about closed for the lease of the Lone Star Brick Works, owned by E. A. Freshwater, to some Pennsylvania parties. The works are located at Penrith, W. Va., and were last operated by R. A. Whiston.

N. W. Ballentyne has built a new plant at Freeman's Landing, W. Va., for clay grinding. He has an excellent vein of clay, and proposes to add brickmaking machinery in the very near future. The plant has a capacity of 125 tons daily.

Judge Taft, of the United States Circuit Court, of Cincinnati, has issued an order to Jas. M. Cooper, receiver of the Royal Clay Manufacturing Company, to offer the big plant, land and mineral rights at receiver's sale, at Uhrichsville, O., May 1. The failure of the Royal Clay Manufacturing Company was

was purchased by the present owners six years ago for \$32,150, and they made \$20,000 additional improvements. Lack of working capital caused the failure. The creditors will all be paid in full. Several parties in Bellaire are contemplating the purchase of the works, and it will apparently be idle but a short time. BUCKEYE.

A PUG MILL AND ELEVATOR COMBINED.

The accompanying picture of a pug mill built for Mr. A. Barr, Urbana, Ill., by the Leader Manufacturing Company, is of interest on account of its unusual length, being eighteen feet long. It is bevel geared, and will occupy the place of an elevating conveyor and its work, in addition to that of tempering the clay. A crusher will be attached to the geared end, and the opposite end will be elevated so as to discharge direct into the brick machine. The Leader Manufacturing Company, Decatur, Ill., has occasionally built similar machines in various lengths, and on account of the flattering reports they have received from parties using them have concluded to add this as one of their regular specialties.

OBITUARY.

The many friends of John B. Clements, for many years Vice President and General Manager of the Christy Fire Clay Company, St. Louis, will be shocked to hear of his suicide, which occurred at Little Rock, Ark., March 17, and was a result of mental aberration caused by sickness, Mr. Clements having



COMBINED CLAY ELEVATOR AND PUG MILL, Manufactured by Leader Manufacturing Co., Decatur, Ill.

the heaviest in the clay industry that ever took place in this section of the country, causing the assignments of a number of well-known Bridgeport, O., and Wheeling, W. Va., capitalists. Mr. C. A. Freeman, Secretary of the Central Sewer Pipe Company, of Pittsburg, and Jas. M. Porter, President of McMahon, Porter & Co., of New Cumberland, W. Va., both practical sewer pipe men, appraised the property on April 8 at \$141,000. This represents an investment of over \$300,000.

It has been learned from reliable sources that the Chelsea China Company's pottery, at New Cumberland, W. Va., will be leased by East Liverpool parties and placed in operation in the near future. Pierce Curby, late Manager of the Akron Pottery, and Thomas Price, who acted in a similar capacity at the Chelsea, are among the projectors of the deal.

The McElfresh Clay Manufacturing Company, of Penrith, W. Va., will close their plant for the purpose of building an immense new plant on the site of the present works, which will be razed to the ground. Bids are now being received for the erection of the building, which will be four stories high, giving a total of 63,000 feet of floor surface, or almost double the size of the present works. The plant will be equipped with the best of latest improved machinery, and will be made one of the most complete pipe works in every respect in the valley.

Lucas Bros.' building-brick yard, at Jewett, O., will be offered at assignee's sale on April 30. This firm made an assignment about a year ago.

The new pottery at Mingo Junction, O., is about completed, and is expected to be in operation by April 15. Henry Dangler, the head of the concern, is experimenting on a new three-decker kiln, and claims this kiln will be of immeasurable value in saving fuel.

The Barnard Brick Company, of Bellaire, O., on April 3, made an assignment to Hunter S. Armstrong. The liabilities are \$25,000; assets, \$55,000. The plant is a model one, and

been in ill health for a long time. He shot himself with a revolver, the ball passing entirely through the brain, causing almost instant death. His associates in business have prepared the following memorial, and request its publication:

—In Memoriam.—

Our dear friend and associate, Mr. John B. Clements, departed this life March 17, at Hot Springs, Ark., after a long period of ill health.

Our heartfelt sympathy goes out to the home circle from which the devoted husband, the loving father, the affectionate son and brother has been so suddenly taken.

For ourselves, we mourn the loss of the true friend, the wise counselor, whose kindness, patience, sagacity and foresight during the many years in which we have had such intimate intercourse made affection vie with admiration in our regard for him.

We grieve to-day, heart to heart, with all the wide circle of those for whom life has been sweeter because of the privilege of association with this noble man. Seldom a single death leaves so great a gap.

In tribute to our friend we direct that the foregoing be spread on the records of this company, and that a copy be engrossed and presented to the family.

CALVIN M. CHRISTY,
JOSEPH M. THOMAS,
CHARLES T. FARRAR,
WILLIAM C. MORRIS,

Directors Christy Fire Clay Co.

St. Louis, Mo., March 22, 1897.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

CONVENTION ECHOES.

Buttonhole Talks.

Editor Clay-Worker:

I was standing in the lobby of the hotel at Buffalo, earnestly regarding the one representative of the "Pair of Asses," and wondering whether I really ought not, dropping clay and conventions, to join them on their trip West, and, donning goggles, make the duet a trio, when there was a jerk on my coat tails and I came down in a seat, and came down hard, while the muscular brother who had seated me immediately inserted his finger in my buttonhole, and, shitting me around a bit into good range of his eye, began: "Now," he said, "you think you have done a whole lot for clayworking, don't you?"

I started in to tell him that while I tried to be modest and remember that there were others, still—but he cut me off suddenly, for he was evidently one of those cheerful fellows who don't ask questions for you to answer, but just toss them in to even up their sentences. "Oh, yes," he continued; "oh, yes; you have found out some things and you have put them in practice, and are selling them or using them for the benefit of Gates, just Gates, only Gates, that's all."

Here I raised a vigorous point of order to the effect that there might be a good deal of Gates about it, but that he must remember there were a good many Gateses; that I did not deny I was laboring for my family, and, incidentally, was myself on the list of those for whom I was working, but that I really did feel a deep interest in the progress of the art, and that I was proud of the progress that had been made, and only hoped that some day I might be remembered as having had some part in that progress. Here he interrupted again, after his manner: "Yes, you have contributed some, a little; it's like the widow's mite, and we mustn't criticise, for it's the best you had, probably, and, in fact, all you had, certainly. There are men, however, who have thoughtfully labored on broad lines, and their work is maturing now and will result in the education of smart, bright, intelligent young fellows, with technical training, and these young fellows, when they go out with the information that they have acquired in this school of Orton's—when they go out from there, I say, and go into different localities, with different materials and under different circumstances, yet still conferring with Professor Orton, they are going to widen the field and build up a future for clayworking in this country that will make this Nation prouder of her clayworkers than of any other line of manufacture, and give the craft a world-wide reputation."

"No; I tell you, the day of Palissy has gone by; that kind of thing won't win nowadays. The problem to be worked out now is broad. No simple running of the glaze will do now, but the glaze must fit, and must fit perfectly. Then it must be applied right, artistically applied. Then a place must be found for it, and the whole thing worked financially. But it is all coming around in beautiful shape, and the 'trade' is becoming an 'art' and is being so recognized. I tell you, Gates, the young men in that school have such a chance as no one on earth has yet ever had to make a place in history, to immortalize their names, and make them known all over the world and for all time."

GATES.

An Absentee.

My Dear Randall:

It has been some time since I have had this pleasure, and shall hope that these lines may reach you and yours in good health and spirits. It was my intention to have been with you during the Convention at Buffalo, but the fearful cold weather South made me change my mind. Would have been delighted to meet all the old boys once again, and hope this pleasure may be in store for me some other time.

In inclose P. O. order for \$4, \$2 for the amount of inclosed

bill and \$2 for my membership in the N. B. M. A., and may you all have a very pleasant and profitable reunion is my earnest wish.

I have not run our works since my son's death, nor is there any immediate encouraging prospects for so doing. Business appears alike everywhere. With best wishes from yours truly,
New Orleans. J. A. BLAFFER.

Ex-President Eggers' Experience and Opinion.

Editor Clay-Worker:

When I read "A Victim Remonstrates," signed A. R. Batley, "Member of Travelers' Association," I did not believe it worth any particular attention, but I have since learned that Mr. Batley is a member of the N. B. M. A., and I therefore desire to take advantage of the columns of the Clay-Worker to express my experience and feeling in the matter. If I remember right, I was one of the first who arrived in Buffalo. I had previously engaged my room, which, by the way, was on the fourth floor of the new Tiff House, comfortable in every respect, with one door and two windows, a good sized room, sometimes a little too warm to sleep in; however, my wife and I were more than pleased, and I may state emphatically that the accommodations were, I thought, the very best that could be had for the money. From my observations, every one about the hotel, from the Manager to the bellboys, did their utmost to make it comfortable for us. Perhaps I may be one of a "very few favored."

When I left Buffalo on Saturday it was with the conviction that every true member of the N. B. M. A. had been more than pleased, for I had heard all praise for the management of the new Tiff House and the Committee on Entertainment. There was done all that could be done to make it pleasant and comfortable for the members and their ladies. I take exceptions to Mr. Batley's "kick." If he had a room without windows he should have refused to occupy the room, and gone to some other hotel, of which there were many in Buffalo, and all with rooms with windows in them.

It is unfair and ill-mannerly to assail the Secretary and the Buffalo committee, who did so much to make the Convention successful. I do not anticipate that there is one person who attended the Convention at Buffalo who would criticise the good people of Buffalo. Mr. Batley ought to know that he has insulted, first, the Committee on Entertainment, who have spent their good money to entertain the members, with their ladies, of the N. B. M. A.; second, he has grossly and outrageously insulted Mr. T. A. Randall, Secretary of the N. B. M. A., who, with the committee of Buffalo, selected the new Tiff as headquarters, and for the best interests of the members, and, third, he has maliciously misrepresented and implicated other members as "kickers," and, to my thinking, has proved himself to be a disgrace to the N. B. M. A., and should retire. There is no room with windows for such a spirit in the N. B. M. A.

FERDINAND H. EGGERS.

Member of the National Brick Manufacturers' Association.
Cleveland, April 3, 1897.

Got His Money's Worth, and More—From Helena to Buffalo—A 4,000-Mile Journey, and no Kick.

Editor Clay-Worker:

Since returning from the Convention at Buffalo, and my brain has had time to settle down to its normal state of action, I find myself meditating, whenever I have a few leisure moments, dwelling on the events of that week, which I enjoyed as much as any one week I ever spent. The most prominent thought at all times is that I owe somebody something, and, in analyzing this idea, it seems to resolve itself into several parts:

First—The custom at the meetings of those of the Quaker religion is that none must speak until they feel a "call," and, as I now feel such a call, first I will give it voice.

John the Baptist, when he was "called," came with his message "as a voice from the wilderness." Now, I feel it my duty—a voice from the rugged hills, sweeping plains and fertile valleys of far-away Montana—to call, with all the power and emphasis that I can put in the words, on all those who have never attended one of the National Conventions—"Go to the next Convention."

I have always read all of the printed reports of the Conventions, and thought I was getting all the good there was out of them, but after attending once I see how greatly I was mistaken. The Convention is like Niagara Falls—you don't comprehend or realize what it is by reading descriptions.

I thought the good of the Convention was in the papers read. Of course, these are not to be belittled or underesti-

mated, and while many were of value to me, yet I got many times the value from personal talks and from hearing long conversations and discussions between the best and most prominent clayworkers of the country. I would hear subjects discussed that had always puzzled me, and then I would keep my eye on the fellow that seemed the best posted, and when I got a chance I would tackle him, and I was engaged in these conversations nearly all the time for the five days—all the time I was not in the Convention hall. I got many others' clear experience on things that had always been obscure to me, and profited greatly thereby. Honestly, if the Convention would be held without any papers, I believe, most who attend would get as much good and profit as much. Still, the papers just start the arguments for outside long-continued discussion, and quiet fellows like myself, who are not adepts in speaking in public, describe our difficulties and get light.

The freedom with which all talked about matters that would be secrets in most businesses surprised me, but, as I was told, a brick manufacturer has competition from those located near him only, and therefore is not injuring himself in giving others at the Convention his best knowledge. Already I am making changes, and, when I start up, am going to put into practice things that will repay many times the cost of the trip from Helena to Buffalo.

I owe the N. B. M. A. for it, and so, fellow-brick manufacturers who have never yet attended a Convention, heed my "call." (I think the fact of my using a "Quaker" machine so long is greatly responsible for this Quakerish call.)

Second—I thought we could "rustle some" out West entertaining people, but the Buffalo Builders' Exchange can give pounds weight and then take the money in a canter. It makes me dizzy yet to think of that smoker, with its eatables, smokeables and drinkables, interspersed with stirring, genuine oratory, side-splitting stories, good music, and, I am sorry to say, some poor music, when you, Mr. Editor, tried to guide that machine men's quartet into the realms of harmony. The only redeeming feature of it was that their efforts to harmonize were as amusing as their voices were poor. Well, you could hardly expect machine men to harmonize, anyway.

The drive around the city was complete in arrangements, and without it we would not have really appreciated the beauties of Buffalo.

But the crowning day of all was when we went to the Falls. We talked brick and took in the sights all day long, and I only hope I will some time have a chance to get even with some of those Buffalo people.

Third—I feel that I owe much to the managers of the N. B. M. A., whoever it is that does the preliminary work, for the thorough manner in which all the details were looked after, not the least of which was the selection of a first-class hotel, whose efficient management made everybody happy and comfortable as far as I heard.

Now, I feel as if my duty in this respect is done, and I hope my words will induce others to go and benefit themselves as I did.

CHAS. H. BRAY.

Philadelphia Brick Manufacturers.

Editor Clay-Worker:

Will you permit me to make a correction in the letter of your Philadelphia correspondent published in your March issue? The Board of Directors elected by the Brick Manufacturers' Exchange of Philadelphia consists, as stated, of nine members, whose names are given here: D. Charles Murtha, Frederick Seitter, Robert Paschall, Murrell Dobbins, Edmund Webster, W. H. Clothier, William Conway, Chas. H. Kimball and Samuel Lloyd, and the correction, it will be noticed, consists merely in substituting the correct name of each Director.

Your able correspondent has very clearly explained the resolution or schedule regulating the selling prices by members of the Exchange. From reports received at the weekly meetings it is indicated that a uniform scale has many advantages, and, when prices are not forced beyond the market, has a tendency to facilitate selling. Contractors and bricklayers express their satisfaction and explain that prices uniformly maintained simplify their calculations in bidding. At the last meeting many of the members announced the sale of their production "for the next four months," and it seems reasonable to expect that we will have a long truce to the disastrous price cutting which has been so demoralizing during the past year.

The Exchange will include in its efforts to advance its members' interests any subject which may lead to that end, and an arrangement for an interchange of ideas by correspondence with similar organizations, especially if its members be also identified with the National Brick Manufacturers' Association, might, it is hoped, be mutually advantageous. The Exchange intends at no time to foster a monopoly or combine in the de-

graded sense, and simply desires that its members may be enabled to transact business without the abuses that come of fierce competition at below cost prices.

E. T. FLOOD.

Philadelphia, March 25.

Can Brick be Enamelled Without Burning?

Editor Clay-Worker:

Is there an enamel at a minimum price that can be applied to concrete or finished brick, without burning afterward, that will be durable, leaving a firm surface? And can various colors be produced? If so, please advise me, and where it can be had, and the information to work it.

L. D. KING.

THE AUTHOR OF "CLAY GLAZES AND ENAMELS" THINKS NOT.

Editor Clay-Worker:

In reply to above query I will say that so far as I know there is no enamel, properly so called, that can be produced without burning. Enamels are silicates, in fact, glasses, and so far as I know any such silicates produced by means other



CHAS. H. BRAY, Helena, Mont.

than fire are subject to disintegration by the action of the weather. In this age of improvement and wonderful discoveries it would be simply ridiculous to say that such things do not or cannot exist. I can simply say I know of none.

I believe any so-called enamel that can be produced upon concrete or burned brick without further burning must, to be durable, partake more of the nature of a paint or varnish. This would have a certain amount of durability, but in time a re-application would be necessary, the same as with any other paint.

There is a concern in New York, address unknown to me, that makes an opaque glass, in sheets, and furnishes a cement by means of which it may be secured to the surface of brick, stone or plaster. I know nothing about its durability, simply having seen small samples.

HENRY R. GRIFFIN.

A Large Return.

Publishers Clay-Worker:

I have taken the Clay-Worker for one year, and am very much pleased with it. I would not take five hundred dollars for what I have learned out of it this year. Inclosed please find two dollars for my subscription for the coming year.

Ontario, Jan. 20, 1897.

J. M. ELKINS.

Burned Clay—Is it the Best Material for Fire-Proofing?

Editor Clay-Worker:

If there is any problem of importance which confronts the architects and the builders who are engaged in erecting the lofty structures now so much in vogue, not only for business purposes, but also for dwellings, it is this: How can we best protect the iron and steel framework from damage by fire? It is a thoroughly established principle that the iron and steel work must be covered with some non-conducting material in order to prevent its being attacked by extremes of heat and cold. It is also almost universally acknowledged that some form of burned clay is the very best material for that purpose. This question was therefore very naturally a prominent one before the last Convention of the National Brick Manufacturers' Association of America at Buffalo, N. Y.

During the discussion following the essay of Mr. H. R. Griffen upon "Clay as a Building Material," Mr. D. V. Purington made some remarks which were misunderstood and incorrectly reported by one of the newspapers of Buffalo, and on this account the subject was again brought before the Convention by Mr. Gates. The substance of Mr. Purington's remarks was as follows: "There is one point regarding the use of clay as a building material which I think ought to be thoroughly discussed by our members at this time. I refer to burned clay fire-proofing. There is not, as far as I know to-day, any material in use under the term fire-proofing that can truthfully be called so. In other words, I have never seen any material which, when subjected to a great degree of heat, such as is produced by the burning of a large building, that would not become useless and go to pieces when suddenly cooled by a powerful stream of cold water being thrown upon it by a hose under pressure. If any one here knows of any material which will successfully resist such extremes of heat and cold I would be glad to know it, for that is what we are looking for."

The statement here made might easily be misleading to those who are not familiar with clayworking in more than one branch of that industry. In thus stating the question Mr. Purington has mixed up two widely separate factors, which ought to and must always be kept distinctly separate when considering this subject. The first is the crude material or clay; and the second is the process or method of making the burned or manufactured material.

Mr. Gates spoke truly when he said: "There is no material that can compare with clay in practical ability to resist fire." So, too, Mr. Fiske made no mistake when he said: "I would like to go upon record as saying that I would stake my reputation as a clayworker on this: that fire-proofing, made of a medium grade of fire clay (not too low a grade), made porous and well burned, will stand any test of heating and cooling to which you can put it."

Every maker of gas retorts knows that the statement of Mr. Batley was correct, that in this country we have vast and unlimited deposits of clays that will, when properly prepared and burned, withstand any severe or sudden change of temperature without any failure.

Clay is the best material for making fire-proof building material, but it must be selected with judgment and knowledge of its quality, and prepared and burned with a practical skill and comprehension of the purpose for which it is intended.

Does not the metallist, when melting the most refractory metals, use clay for his crucibles? Do not the glassworkers use clay for their melting pots? Are not the blast furnaces lined with clay for melting ores? And does not the tobacco-pipe maker use clay for his porous and fragile product? We know they do, but the clays are various and divergent. Each has his own peculiar method of mixture and method governed by the result he wishes to obtain.

Careful investigation will surely teach us that the chief quality demanded of all clay products is governed by their varying degrees of density and porosity (when color is not in question). Porcelain bodies do not make good fire brick, nor will porous terra cotta make good wine bottles, yet clay is the chief material in each of them.

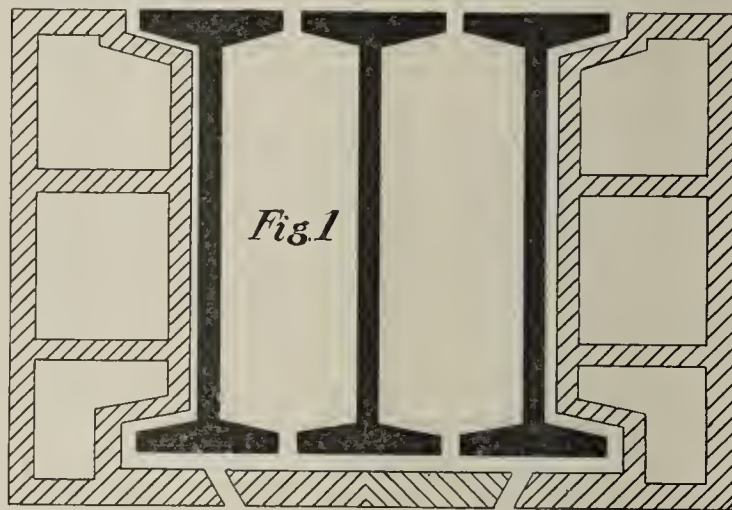
The clay for making fire-proofing material should be a low grade fire clay. The presence of impurities does not affect its usefulness, except as far as they may increase the mechanical difficulty of working. Color is of little consequence. Such clays, when well burned, will be hard, tough and porous.

Clays which will make good red face brick are not suitable for making fire-proof material. I know that much so-called fire-proofing is made from such clay, but that does not controvert the fact that they are improperly so used. Red clays, as a rule, are easy burning clays, readily vitrified. Such conditions are out of place in a burning building, and, I fear, may have produced the result mentioned by Mr. D. V. Purington

when he said: "I know that a scientific man in Chicago, who has given much attention to the study of fire-proof material, has found that vitrified clay, when used as fire-proofing, has proven a failure every time when subjected to great heat and cold water under pressure or force."

That is just what must happen. Vitrified clay is not good fire-proof material, but hard-burned porous fire clay is the very best fire-proof material that can be made.

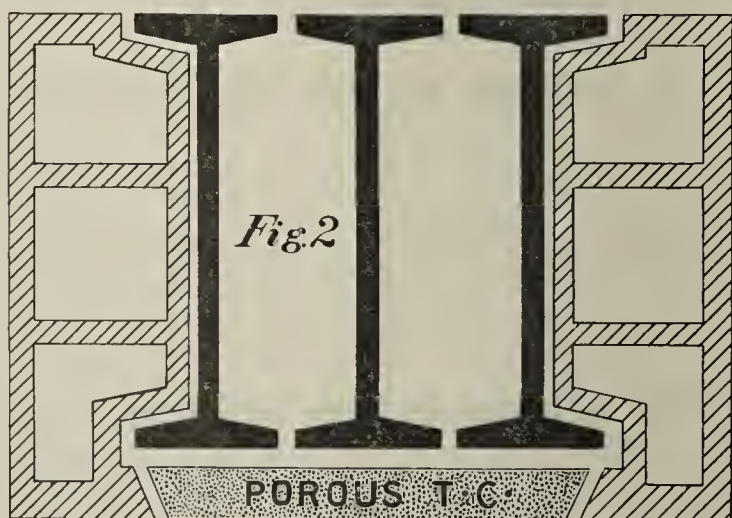
The possession of any crude material, no matter how perfect



its qualities may be for the use of its manufacture, is not in itself sufficient to fulfill its practical utility. There must also be a knowledge of how to properly manipulate the clay and how to form it into the best shapes and thicknesses that will best serve the objects of its use. The improper use and application of many materials has often led to failure and disaster, and has misled public opinion, as expressed by uninformed persons, to the condemnation of materials that were most worthy of appreciation, the condemnation being entirely due to the failure of method of construction.

In the discussion of this subject by the Convention, Mr. Gates illustrated a method too often used for the purpose of protecting a compound girder. Such girders, made of three "I" beams of iron or steel, are frequently used in the modern system of buildings, as shown in Mr. Gates's diagram (Fig. 1).

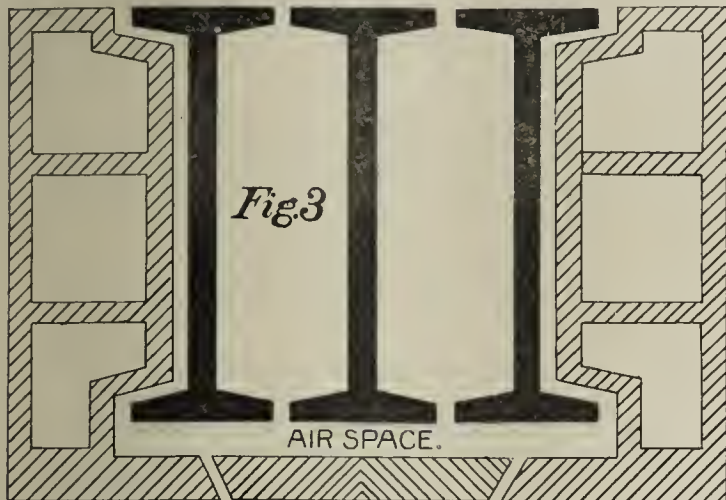
By referring to this diagram it will be seen that the soffit, or lower surface of the girder, is covered with a very thin slab or tile of burned clay, which is supported by two long and thin flanges of the same material, projecting from the side blocks; it will also be noted that this tile and the flanges are close to the metal beams. This is a serious fault in practice, because the soffit is the very surface which has to receive and resist the most intense and severe action of the fire whenever one gets started in the room beneath it. Should such tiles have been made of hard burned red clay or of vitrified clay of any de-



scription they would most surely crack and break and fall, when tried by fire, and thereby leave the girder exposed to damage in its most vulnerable part. Too often this thin tile is less than one inch in thickness, from a desire to make the fire-proofing as light as possible. When these thin forms fail, when tested by fire, uninformed persons too often declare that burned clay is not a sufficient protection from fire, while the truth is that the manufacturer and constructor were alone at fault, and the clay in no way responsible. One inch of burned clay alone is not an efficient protection under such conditions. Yet such a girder can be so covered with burned clay as to render it

absolutely safe when exposed to great heat from the burning of combustible materials confined within the walls of a room so that the heat is concentrated upon the girders which support the ceiling of such a room. Mr. Taylor made a diagram of a method he suggested which would overcome the element of danger shown in Fig. 1, and so justly condemned by Mr. Gates.

Making a comparison of the soffit covering of Fig. 2 with that of Fig. 1, it will readily be seen that there are three im-



portant differences made in the treatment of the soffit surface.

First—The supporting flange at A is short and strong.

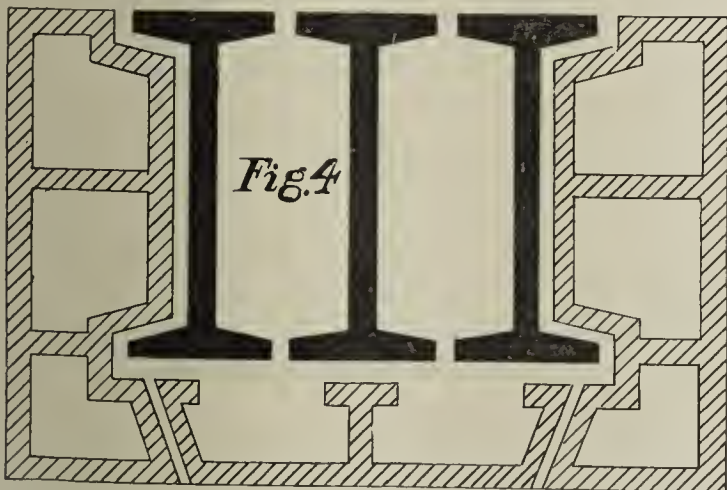
Second—The soffit tile is made of porous burned clay.

Third—The tile and flange are two inches thick.

By this method of manufacture the whole surface of the metal girder is covered with a non-conducting material that has absolutely no liability to crack or break under the most severe differences of temperature.

The use of porous terra cotta for the soffit tile (which is a material made of six parts sawdust and four parts clay) furnishes a tile full of air holes or cells, and renders it impossible for any hurtful heat to penetrate to the metal. The short flanges at A reduce the liability to cracking or breaking to a minimum, and the additional thickness affords greater solidity without increase of weight and greater ability to resist the action of heat. Some architects who are inclined to the use of hard burned clay for fire-proofing do recognize the value of an air space between the burned clay and the metal girder. This method of making was described by Mr. Farnham, as shown by diagram (Fig. 3).

Every practical manufacturer of fire-proofing will agree with Mr. Farnham that the free air space of even one inch is of great advantage in resisting fire, even if the tile is made of vitrified or hard burned clay, provided that the tile remains in its place. But there is always a danger that the tile may be pushed up and out of place by a stream of water being thrown against it by a fire hose, which, while strong enough to displace



the tile, might not be continuous enough to quench the fire. When porous terra cotta tile are used they contain all the air space in its best possible form; they can be cemented solidly against the steel girder so that it would be impossible for them to be displaced by any stream of water projected against them from an engine.

In concluding the discussion of this matter it would only be fair to let Mr. Gates, who is a leading terra cotta manufacturer, submit his crude sketch showing how terra cotta could be utilized in a double capacity—as a fire-proof protection and an external finish when such girders are used under external

walls. We have only copied the constructive idea of Mr. Gates's diagram, and introduce it as Fig. 4.

This class of construction is frequently used in some form or other, as may be suited to the architectural and ornamental purpose of the designer. This is pre-eminently the iron and clay era in architecture. Who can tell how much the modern steel construction engineer rests upon the clayworker. Terra cotta facing for steel skeletons is held in place by a variety of anchors and tie rods, especially prepared to suit the various demands of dimensions and ornament. All this infinite variety is omitted here, but it must be said that the large amount of air space behind such terra cotta facing and its bulk render it one of the very best methods of fire-proofing. There is not any nor can there be any good reason for doubting the correctness of the maxim of the National Brick Manufacturers' Association that "burned clay is the very best fire-proofing material."

JAMES TAYLOR.

A Change of Base.

Publishers Clay-Worker:

Inclosed please find postoffice order for \$2 to cover my subscription account. We have moved our plant from Grove City to Butler, and have been in operation since the holidays. Trade outlook is good. We are going to erect three more round down-draft kilns; will begin work on them about the middle of next month.

The Clay-Worker has been a great help to me. I like to read the discussions, and particularly the proceedings of the Convention.

J. C. BRANDON, Secretary.

Butler, Pa., March 20.

Way Down in Maine.

Editor Clay-Worker:

When the Convention number of the Clay-Worker reached here and the brickmakers had begun to read the excellent report of the Brick Manufacturers' Convention there was a general expression of regret for the apathy that kept them from joining in the good time in Buffalo. But we are not much used to Conventions down here. They never come our way. If the N. B. M. A. meets again in the East, or not too far from it, the Secretary may safely count on at least eight new faces in the council chamber. The report of the Convention given in the Clay-Worker is worth many dollars to the practical brickmaker. The wonder is that so thorough a report can be issued so shortly after adjournment as that was.

The brickmakers are hoping for better times. The season of 1896 was a fickle one. The spring opened dull, with no demand and lots of bad weather. Midsummer market took a spurt and caught all on half crews, with little stock on hand. Fall found many with full crews, dull weather and a dead demand. Thanks only to the execrable weather, the stock of bricks wintered was very light, and the manufacturers hope to gather from the ill wind of last year the good of fairly profitable prices for early sales this spring. Where, ten years ago, it was not strange to find 6,000,000 of bricks wintered over, this spring one cannot find over 600,000 in the yards of Brewer. But that is only indicative of the change that has fallen upon Brewer brickmaking. Fifteen and twenty years ago the shipments of bricks by vessels ran up to 30,000,000 or so each year. Last year the water shipments might have aggregated 50,000. Our yards now depend entirely upon the local demand, and a building project to call for a few hundred thousands is watched with as much anxiety by the brickmakers as a fat bone might be watched by a crowd of hungry dogs.

Last year we had the new Eastern Maine Insane Asylum at Bangor, calling for several hundred thousands, and some mill projects and public buildings scattered about calling for a few hundred thousands more. These were considered the basis of the season's work, and times seemed dull. This year it is in doubt whether the asylum will call for a few hundred thousands more, and, with the exception of one proposed new block in Bangor, there is nothing else in sight, yet we are all looking for some unseen developments.

One of the grievous faults of the down-east brickmaker is his blind faith in or unreasoning distrust of "the times." He neglects to take advantage of circumstances. This is shown by the action of the manufacturers last year. At the time when the local market was at its lowest ebb and the demand was nil, bricks were going for \$9.50 per thousand in Boston. Freight could be had for \$2 per thousand, netting the shipper at least \$7 per thousand, and not one took advantage of these conditions, and every brick in this section would gladly have been sold for \$5.50 net. Because the Brewer brickmaker found the Boston market unprofitable many times, it is to him unprofit-

able at any time. And yet there are few brickmakers who were not in business at the time which they love to recall, "when Brewer bricks ruled the Boston market." That was before the day of disintegrators and crushers, when the mixtures of clay and stone near Boston were unavailable for brick-making.

Saco, Me., once unheard of in brickmaking, is now the furthest advanced of any city in the State. Its brickmakers have been following the strides made in new methods and have caught that which is best from each. To-day Saco brick are in demand from the northern boundary of Maine to Providence, R. I., and Saco methods are being adopted by brickmakers here and elsewhere.

The largest brickmaking plant on the east side of Penobscot river is that of Hon. Hugh O'Brien, of Brewer. Mr. O'Brien's output last year amounted to more than 2,000,000, all of which were used along the line of the Maine Central and Aroostook Railroads. Mr. O'Brien visited Saco last spring and had his eyes open. When he returned he brought with him two quiet looking Frenchmen. Then he built a kiln and let the Frenchmen take charge of the burning. The expert burners of Brewer were deeply interested, and when they saw that the strangers were burning with no fire outside the mouth they went away out of sight in groups and slapped each other on the back, and laughed derisively at "Hugh's foolishness." Somehow or other the strangers got a lovely burn, but that was considered just luck. Then they fired another kiln, and there was the same number of winks and meaning smiles, but that kiln proved to be a thorough burn, too, and so did the next and the next. Now the Brewer men who could swear that bricks could not be thoroughly burned unless fire was kept outside the mouth have been stealing away to the Saco men to learn how it is done on the quiet.

Hugh O'Brien expects to manufacture 3,000,000 brick the coming season. He is an energetic man who has seen the ups and downs of brickmaking. He was born on his brickyard. His father was one of the wealthiest men and a brickmaker of Brewer. After his father's death Mr. O'Brien opened a brickyard and sunk his patrimony in a few years. Then he went to Colorado and made and lost another competence in a brickyard. Returning to Brewer, he bought an old soft mud machine and placed it in the old O'Brien clay bank. Then he hired two boys and he filled his own machine and struck out his own bricks for two years, until he had gained a few hundred dollars to afford to purchase machinery and hire men. He is now well-to-do, and some citizens of Brewer proposed to elect him Mayor of the city on the 8th day of March, but he was defeated by a small majority. He is a Republican and a silver advocate.

For many years there have been at different times serious talks of forming a union of brick manufacturers, but each time it has amounted to nothing. Since the Buffalo Convention the talk is renewed. A union would greatly benefit the members of the craft, but rivalry and cutting prices has had a firm grip here for years, and it will be hard to overcome.

D. U. N.

Bristol Glaze no New Thing.

Editor Clay-Worker:

In reading your worthy magazine, in which we always find newsy and interesting items, we run on to the paragraph, on page 273 of March issue, stating that the Galesburg Pottery Manufacturing Company are experimenting with a new glaze known as Bristol glaze. To set your readers right in this matter, will say that the white or Bristol glaze is no new thing; even here in the West we have been making it for the past two years, and the Eastern shops, at Akron, O., and points in Pennsylvania, have been making it for twenty years. We are shipping two cars of this ware per day, and are, in fact, the only Western pottery making a full line of this ware.

Wishing the Clay-Worker the success it well deserves, we are, respectfully,
THE MONMOUTH POTTERY CO.
Monmouth, Ill.

Detroit Items.

Editor Clay-Worker:

A. Wagner, Dearborn's only brickmaker, is the owner of a stylish brick hotel he has just erected. It graces the main thoroughfare of the township.

Greusel Bros. furnished all the brick for St. Joseph's Retreat, at Dearborn, Mich., upwards of 1,500,000. With this great addition to the main building the Retreat now ranks among the foremost in the State, both in size and architectural beauty.

John Archer, of Archer & Collins, is now engaged in dealing

in paving supplies. At the recent election Mr. Archer was a candidate on the Republican ticket for Sheriff, but was defeated by Harry F. Chipman, son of the late Congressman Chipman.

The contract has been let for the erection of the Wayne County Building, R. Robertson & Co. being the successful firm. The building is to be commenced immediately and finished in two years. It will be built of brick and granite. Of the former it will require about 5,000,000.

The Majestic Building, which is completed, and will soon be occupied, is the tallest in Michigan, it being fourteen stories. The steel framework is incased in brick and has white terra cotta facing, making it both a handsome and substantial building. Benjamin Hyde, the Chicago architect, with Marshall H. Godfrey, of Detroit, were the promoters.

The near future will witness all, or nearly all, the brickmakers in this vicinity using the pallet rack system. Conrad Clippert was the first to embark in this line. Greusel Bros. and Dennis Burke will have their respective plants thus equipped in readiness for the coming season. It is rumored that several others will do likewise.

Business is Much Better.

Publishers Clay-Worker:

In payment of subscription to the Clay-Worker from April, 1897, to April, 1898, I hand you Chicago exchange for \$2. The Clay-Worker is very valuable, and I do not want to miss a number. The outlook for business is much better than it was a year ago, though we had a satisfactory year in 1896.

With best wishes, I am, respectfully,
O. T. DENISON.
Mason City, Ia., March 20.

Making Paving Brick in Washington.

Dear Mr. Randall:

We began making brick March 22. If the market will justify it, we will add a double repress, and thereby treble our present output. I bought, while East this winter, a goose-neck and steam lubricating dies, for both end and side cut brick, which will enable us to use our sewer pipe machinery, using a Raymond press for repressing.

I enjoyed meeting with the brick manufacturers, at their annual Convention, very much, and do not think any one had cause to regret their having been "put off at Buffalo." I have read reports of the past meetings in the Clay-Worker with a great deal of interest, and have for a number of years been anxious to attend the annual meetings. This was my first opportunity, and I shall be even more anxious to meet with you in the future.
WALTER S. BOWEN.

Little Falls, Wash.

Bucyrus, (Ohio,) Notes.

The Battenfelt tileyard will start for the season April 1, with L. P. Battenfelt in charge. The outlook for tile is more favorable than last year. This yard will start with the usual force.

The Des Moines Brick Manufacturing Company, of Des Moines, Ia., one of the most progressive firms in the West, is making some extensive improvements, and will put in three Eagle represses and an automatic table of the American Clayworking Machinery Company's make.

The city of Bucyrus, O., contemplates paving a few connecting cross streets this season, though no extensive improvements in this line will be made. Bucyrus already has a large percentage of paved streets, and with better times next year further improvements in this direction will be pushed.

The Nelsonville (O.) Sewer Pipe Company has purchased an Eagle repress from the American Clayworking Machinery Company. The Nelsonville people report the outlook for business much improved.

D. P. Guise, Williamsport, Pa., one of the leading clayworkers of that State, has placed an order with the American Clayworking Machinery Company for an Eagle repress. The Guise works will be further improved, and will enter upon the new season fully equipped to get its share of the business.

The American Clayworking Machinery Company, of Bucyrus, O., has found it necessary to further increase its force, both in the mechanical and clerical departments. The shops are working full time in every department, some branches putting in extra time in their effort to keep abreast of the orders. More traveling men have been put on the road (in addition to the ones whose portraits appear in this issue of the Clay-Worker), and there is a general air of old-time business rush with this establishment.

Down in Jersey.

Editor Clay-Worker:

I desire through your columns to express to the brother and friends of Mr. Samuel J. Selden, of Erie, Pa., an account of whose death I note in March issue of the Clay-Worker, the sympathy of one who knew him well, being intimate with him for one year. As Superintendent of the Selden Brick Company the writer had many opportunities of knowing the golden heart contained within his breast. None could suffer without his ready hand to help over the rough places. Mr. Selden had one of those hearts which, we are sorry to say, are very infrequently found in the breasts of an employer—a heart that could not turn away without saying a word to heal or putting his hand into his pocket for the wherewith to alleviate suffering. We regret very much to learn of his death. Being a man of many virtues, he will be missed by many warm friends besides his immediate relatives, and his place will, indeed, be hard to fill.

The clayworking industries in this section of the country are moving along on about the same scale as when I wrote you last. Many men are now drifting through this city towards South Jersey in order to procure work at the common-brick yards, which will shortly start up.

Some of our hollow brick factories have joined a combination to control output and prices, which we hope may be a benefit to them. All the factories are working about full time, and, we understand, are doing a fair amount of shipping. Prospects are fair for a good summer's demand.

The terra cotta works are jogging along in about the same old rut. Many more men could be employed if orders were more plentiful.

The business men of this city have organized a Board of Trade of more than ordinary advantages to help advance the interests of this city.

In conversation with one of the oldest brickmakers in this city, this morning, we were told that he knew parties who would take the whole of the product of a plant capable of turning out 15,000 to 20,000 buff brick per day, provided the plant was erected on a scale that high salaries would not eat up all the profits. This gentleman said he would take stock in a new plant, and knew of a location where the clay was simply perfect for the purpose. If any of your readers desire to inquire about this matter your correspondent will take pleasure in answering same.

We have clays of any color desired, also sands of all grades, red shale by the million tons for pavers, four railroads, the best harbor on the coast, completely land-locked, and why shouldn't we have a thriving city?

Mr. Piatt, formerly with the C. Pardee Works, later with the Raritan Hollow and Porous Brick Works, has gone to Philadelphia, Pa., to take charge of the glazing department in a pottery there. We are sorry to lose such men as Mr. Piatt.

We hope, in the near future, to give you a description of the Standard Fire-proofing Company's plant, now under the management of Mr. Robert Lyle. This is an immense plant, and as Mr. Lyle has promised us photos of the works, your readers will agree with me that the place is very advantageously situated.

We are informed that the American Enameled Brick Company, of South River, are now taking up the manufacture of face brick in all colors. Being so very busy for the past three months has prevented my visiting that side of the river, but we rather think Brother Jacquart knows what he is about, so feel that the fronts will come out all O. K. under his efficient management.

Building prospects are bright for this city. We keep right on "sawing wood" and erecting buildings, year in and year out. The only fault I see is in the fact that too many buildings are of "sawed wood" instead of brick. We are promised one brick business block just opposite Hotel Central; indeed, preparations are now going forward for the removal of old wooden structures to make room for the new brick one.

At this writing I am informed that the United States government has commenced work on a large sea wall on Sandy Hook, and have sent orders here for all the union masons that desire work. This work, it is said, will last a long time and consume many yards of stone and brick, and, incidentally, several millions of Uncle Sam's "boodle."

Red brick have advanced 25 cents per thousand, so I was told to-day, being \$4.25 at kiln.

We notice preparations for a great deal of building in New York city, and, according to New York papers, real estate is selling rapidly with a view to building. This should make a demand for brick.

We have the report in this county that a large paving brick plant is to be erected at New Brunswick, the county seat; capital, \$100,000. The red shale is found in abundance in that

neighborhood, as wells have been drilled to a depth of five hundred feet in red shale.

The writer recently drilled a well for the Ostrander Fire Brick Company, Ostrander, N. J., finding an excellent supply of soft water.

We have heard many times that the fire clays of this State could not be vitrified. If any person desires to see this story refuted he can see some of the hardest burned brick ever made at Ostrander's. These brick come from their continuous kiln.

Many repairs and improvements are being made at this plant. Among the lot is a complete overhauling of the large tubular boiler and Corliss engine, a complete repairing of one locomotive, etc. All this work will put this plant on a good working basis for spring.

As I write we are having our first thunder shower, and as many men are now passing south towards the brickyards, we believe spring is upon us.

W. R. O.

On the Pacific Coast.

Editor Clay-Worker:

Secretary Colburn, of the Salt Lake Chamber of Commerce, was recently in receipt of a letter from a gentleman at Fairview, Utah, which conveyed the information that he had discovered large deposits of fire clay, soapstone and talc, a substance used in the manufacture of fire brick, sewer pipe, furnace linings, chimney flues, tiles, china, pottery, stonewares, etc. He claims that it has been tested and proved to be of excellent quality. There are parties in Fairview who are willing to engage in the manufacture of articles above named, and he has been corresponding with a company of skilled potters in East Bountiful, O., who are desirous of knowing more about Utah, and whether or not first-class potteries would be a paying industry in the West.

At a recent meeting of the International Bricklayers' Union the report was made that business is showing an upward tendency, but that there are yet plenty of men to fill all demands for any work that appears in sight.

The San Jose, Cal., Brick Company has been awarded the contract to furnish 3,000,000 bricks to be used in the construction of the Spreckles Sugar Refinery, at Salinas, Cal., which is to be the largest institution of its kind in the world.

The Baden Brick Company has resumed active operations, and is putting in a patent continuous kiln for burning brick.

The Aberhill Coal and Clay Company was recently incorporated at Los Angeles, Cal. The purposes of the company are to purchase and lease coal and clay lands and to mine and sell coal, clay and other minerals. The capital stock is \$100,000, and the Directors are James H. Hill, Fred T. Hill, of South Pasadena, George C. Hill, of Los Angeles, and C. H. Avery, of St. Louis, Mo.

The pottery clay found on M. M. McDonald's ranch, at Goshen, Wash., is reported by an expert as suitable for making certain grades of pottery, but not of the quality required for high grade pottery work.

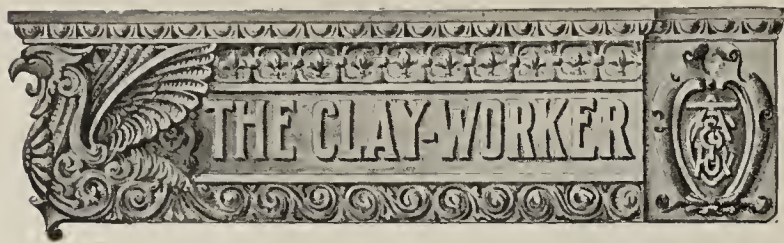
J. Simons, formerly of Pasadena, Cal., is in San Pedro, with a view to establishing a brickyard.

M. L. Rush, a potter from Illinois, recently had a conference with the Labor Exchange Association, of McMinnville, Ore., in connection with the establishment of a pottery in that town.

A. E. Brown will start a brick kiln near Aztec, Mexico, and has announced his intention of burning 150,000 bricks this spring. Most of the clay is already mixed. SUNSET.

Traveling in Private Cars.

Traveling in a private car is a luxury that may now be enjoyed by any one. Any person desiring to rent a private car for any special trip the coming summer to the Pacific coast or any of the Eastern or Northern resorts can do so by applying to any agent of the C., H. & D. Railway or by letter to D. G. Edwards, P. T. M., C., H. & D. Railway, Cincinnati, O. These cars are fitted with every convenience, drawing rooms, sleeping rooms, dining rooms, and carry a full crew of waiters and cooks. Where a party of ten or more get together the arrangement is as economical as first-class hotel accommodations. Parties desiring to go to Chicago via the C., H. & D. Railway can enjoy all the conveniences of a private car by simply paying for their railway ticket at the usual rate and \$2 a berth for sleeping car. The compartment sleeping cars on the C., H. & D. are arranged in separate rooms, each room containing two beds, a washstand, drinking water and every appliance for the toilet. If desired, one, two or even five of these rooms can be opened into each other en suite, but secluded from the rest of the car. The luxury of these cars can only be appreciated by personal experience.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " " " " " "	10.00
Ten copies, " " " " " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVII.

APRIL 1897.

No 4.

CURRENT COMMENT.

The brickmakers of St. Louis have finally got together and formed a local association, with Authouy Ittner as President. All of the leading firms are in it, and it is hoped that a better condition will prevail in that market for the balance of the year. Prices have ruled very low there for several years, ranging below the \$5 mark, delivered.

* * *

Mr. Bray's letter, on page 359, is of more than passing interest. We hope it will be read carefully by the stay-at-homes, who think they get the meat of the Conventions in the printed reports. This is a great mistake, as Mr. Bray clearly states. Brickmakers seeking reliable information find that it pays to attend N. B. M. A. Conventions and drink of the fountain of knowledge direct, rather than through the medium of the reporter.

* * *

Ex-President Eggers is a very positive, though kindly, man, who says what he means and means what he says. He neither deals in innuendo himself nor has any patience with those who do. His remarks anent the Buffalo meeting (page 358) are terse and pointed. Having assisted the Secretary of the N. B. M. A. in arranging for the entertainment of the members of that body in Cleveland in 1894, he appreciates the difficulties incident to that function, and is justified in speaking with a degree of warmth that may seem severe to the uninitiated.

* * *

The longed-for tide of prosperity has set in. The paving brick manufacturers are all quite busy. At Canton all of the plants save one, which is in a legal tangle, are running full time, prices averaging a little better than last year. The same may be said of the Galesburg factories, the Purington works having booked orders that will keep them busy for some months. "Master" John Sibley, Coaldale, Ala., is credited with having sold 8,000,000 pavers. He writes that he has been too

busy for comfort ever since his return from the Buffalo Convention, and that the demand for building brick is improving also. We hope to chronicle many such experiences in the near future.

* * *

A rather remarkable bit of terra cotta work is illustrated on our first reading page—a white enameled terra cotta newel in one piece. It is nearly four feet in height, and weighs about eight hundred pounds. Other terra cotta features of this job are equally interesting, notably that of the entrance, shown on page 332. The raised letters are white enamel and stand out in bold relief, the photograph not doing justice to this feature. Friend Gates may justly take much pride in this work, which emphasizes the enlarged possibilities of terra cotta construction, due in no small measure to his individual efforts.

* * *

Not the least pleasing feature of an editor's life is the sympathy which his relation to his readers engenders, especially when that relation continues through many years, by the repeated renewals of subscriptions and by other substantial evidences of appreciation and confidence. Even if his is only a trade journal, with a special industry to promote, he comes to sympathize with his readers in whatever interests them, rejoicing in their joys and sorrowing in their sorrow, though they may have only a very remote relation to the immediate interests they seek to promote, and, on the other hand, his readers become interested in his thoughts on questions of common interest outside the specialty which must bind them together. Hence we freely express our opinions upon a few current topics, being assured that they will be read with interest, whether acquiesced in or not.

BETTER TIMES.

More than once the Clay-Worker has cautioned its readers against anticipating a sudden leap from the very low ebb that all business had touched to the high tide of a few years ago. To all who are looking for better times through any legitimate channel the times have greatly improved, especially if their purpose is to make times better instead of waiting for somebody else to do this for them. Of course, all who attribute business derangements wholly or even chiefly to this or that economic policy of state have not seen the desire of their hearts. The change of administration means ultimately a change of policy in some respects, but no human law can abrogate or even suspend the inexorable law of living within one's means as the law of success. Our information from the field is that there is an improved demand for brick over this time last year, and, though prices at some parts rule lower than formerly, this is quite offset by the fact that whatever the brickmaker has to buy is cheaper also. But the most significant indication of better times is formed in the philosophy and patience with which everybody accepts the situation.

A PAINFUL OBJECT LESSON.

Since sending out our March issue a painful object lesson has developed which enforces the contention of the Clay-Worker as to the real cause of hard times more than pages of abstract reasoning could possibly do. The bottom has just fallen out of one of the many schemes which robbers have devised from time to time to filch honest savings from the poor. The E. S. Dean Company had succeeded, in a little more than a year, in obtaining many millions, how many may never be known, from a class of ignorant men and women who wanted to get rich quick and by other means than patient, plodding industry, by obtaining at somebody's expense, they cared not whose, and by any means, they cared not what, enormous dividends on moneys committed to its care. Though located in New York, its operations were chiefly in the rural districts, and its victims the unsuspecting and uneducated, who were easily persuaded to trust their all with it. Investigations have developed that the E. S. Dean Company is a woman, once a chambermaid in a hotel, and later a typewriter, with no capi-

tal and little character, and its secretary was a boy only about eighteen years old. It is this haste to get rich which has had more to do with creating hard times than all the economic or currency measures in the world, and such fraudulent schemes will find supporters while men and women cherish this passion to get rich without work.

THE FLOODS AND HARD TIMES.

At first thought we are apt to believe that those whose farms are submerged and whose crops and buildings are washed away by the floods are the only sufferers. They are the first to suffer, and, in the end, the chief, but such is the solidarity of society that all suffer sooner or later. The floods of this spring, though greatly damaging, are not unprecedented, and though public attention has been called chiefly to the Mississippi, all along its tributaries, even to insignificant runs, individuals have suffered, some as severely as those on the great rivers, but, being less conspicuous, they have attracted less attention and less sympathy, but the aggregate waste of wealth from floods alone has greatly contributed to the common distress. The same is true of losses by fire. That much that is lost by fire has been recovered from insurance does not matter as to the great public loss, for the money paid has been contributed by the public for this purpose. Let us look at these facts as philosophers, and be patient and hopeful.

OUTSIDE AFFAIRS.

No marked change in the affairs of our little neighbor, Cuba, has occurred during the month. The tide continues to set in the same direction. Cuba will be free, as she deserves to be, and largely aided by American diplomacy, enforced, most likely, by actual or threatened collision with Spain. Did you ever watch the ebbing out of life that was doomed by an incurable disease? Death might come at any moment, and it might not come for weeks or months, and when it came there might be very little change of condition until the very last. Turkey has been called "the sick man of Europe" for a half century, and in some respects it seems no sicker now than fifty years ago, but evidently the end is near. As we write the wire conveys intelligence of skirmishings on the borders of Greece, but the next hour may tell of the unchaining of the fierce dogs of war. No matter; Turkey will be blotted out, and Greece will survive.

THE FOLLY OF LIGHT BRICK WALLS.

In this city we have recently had experience which illustrates the value of the present building regulations, which are not greatly different from those of any moderate size city in this country. Certainly there is nothing in our building regulations which works hardship on any one. It relates principally to the construction of walls and protection against fire. The question of floor loads and other conditions have not as yet been considered. In one instance, a building worth probably not less than \$30,000 had to be condemned because the outer walls were not strong enough to sustain the structure after a fire in the building next to it. Another building collapsed suddenly for the same reason. In another instance, walls joining a commercial structure and a theater building had to be taken down at great expense. The walls surrounding these buildings were twelve inches in thickness and three and four stories high. Manifestly, this is bad engineering, but the public will build as badly as it may—that is, as poor as regulations will permit; it is lamentably true that legal restraints are necessary to prevent not alone building which is dangerous to life and property, but, as well, that which is dangerous to one's own fortune. Any architect knows that he has great difficulty, where he does not have the help of building regulations, to secure the proper thickness of brick walls. In the county towns adjoining this city there are great crimes against good building, and the only reason why there are not serious collapses is the fact that the loads carried are usually

light. The insurance regulations which prescribe certain rates for bad walls and certain other rates for good walls are having a beneficial effect in building matters. It is well that brick-makers throughout the country should know this, and that they urge upon those who build the advantage to the builders' pocketbooks of providing walls of proper thickness. It is well to bear in mind that the insurance rate is not affected alone as to the building, but as to the stock which it contains, and for all time. The easiest way to touch any man is through his pocketbook, and if it be shown him that the difference in cost between a light wall and a heavy wall will pay for itself in from ten to fifteen years in insurance alone, there is some chance of converting him to the idea of good building.

THE COMMON WEAL.

One's view of the present financial condition of the country is apt to be a narrow one. What affects one branch of our industry is but lightly considered by the representatives of other industries. Each thinks to stand or fall alone. The manufacturer of iron does not concern himself seriously with what affects the worker in clay, nor does the latter care for him who deals in wools or cottons. It is useless to say that each will take care of himself; that each has enough to do to look to his own interests. This is undoubtedly true. The mistake lies in our narrowness of view as to what constitutes our own interests. We do not sufficiently consider that it is in general prosperity that individual interests are advanced, and that individual prosperity is the aggregate of the various industries of a nation. Neither silver nor gold nor bimetalism will alone bring prosperity to a country. A monetary system is simply one factor in a great problem. It is the general success of every branch of industry, of agriculture, of manufacture, of commerce, of our railroads, which will bring a permanent condition of prosperity. The sooner we, as individuals, recognize this and give active attention to bringing about conditions tending to increase the prosperity of every kind of industry the quicker will our own individual interest reach a satisfactory state of permanent success. Let the clayworker not regard alone his own particular branch of manufacturing and its kindred industry—building. Let the clayworker look to the milling industry and the general conditions which affect it; let him be content when the manufacturer of iron goods finds his affairs prosperous; let him give his aid to bringing about a sentiment leading to the bettering of agricultural products and finding a market therefor. It is only through the general prosperity of the nation in its individual industries that we, as workers in clay, can hope to succeed permanently.

THE SURVIVAL OF THE FITTEST.

There are many factors leading to permanent prosperity in this country. Hitherto we have been the one new world, with most abundant resources. We have had but to scratch the sod and we could almost feed a world. Our mineral wealth has been and is almost illimitable. But these are crude conditions, conditions which only bring prosperity when a country is without competitors in its own particular fields. As long as we could send raw materials abroad in large quantities, as long as a ready market was found for what we could readily produce without skilled labor, without the use of the scientifically trained mind, so long we were successful, no matter how faulty our commercial system. All went well. But the world has changed with astonishing rapidity these last few years. We are not longer the new world. We are only one new world, and there are others younger than ourselves. Old worlds are renewing their youth and competing with us; new worlds are coming to the front and thrusting us back in the race. We must now not alone compete with those who are entering what hitherto has been our legitimate field—the production of raw materials and the production of the cruder products of manufacture—but being no longer comparatively young, we must

compete with the old world on her own ground, and produce those things which are the result of the highest intelligence; and, having produced them, we must know how best to market them.

This same old world is also not alone leading us a chase in the production of those things which require the highest, the most skillfully trained hand and mind, but she is entering our own field, the production of the raw material, and bringing to bear upon it a trained intelligence that makes her formidable, notwithstanding her worn-out soil. Verily, we seem to have fallen into hard lines—crowded, on the one hand, by competition in our old fields, and not yet ready to compete with the world in any other.

THE IMPORTANCE OF LITTLE THINGS.

It is not lack of resources which is crippling us; it is not lack of native capacity in our people. It is lack of the special training of each man for the one work he has to do, and a failure to comprehend that a broad, catholic understanding of the general conditions which govern the whole productive world is absolutely necessary to individual success. No man, no, nor no set of men, engaged in a special branch of industry can build a Chinese wall about themselves. What is fatal to a nation is fatal to the individuals thereof.

We as a commercial nation are noted for one thing—a lack of regard for the small details of our commercial pursuits. This is undoubtedly due to the ease with which we have hitherto gained a competency. Why trouble ourselves about little things when success came without this trouble? But success no longer comes without it. We must regard every small detail of what we undertake. We must study each commercial problem intelligently and profoundly. How can we do this unless we thoroughly understand the work in hand to its last limit? What we need is special study of what we undertake to do, be it agriculture or manufacture or the science of buying and selling. We need special instruction in our schools, thorough, deep-rooted instruction, so that when a young man enters business life, whether as merchant or manufacturer, he thoroughly understands not only the minute details of his own calling, but the principles which govern commerce the world over. Let him understand what England's policy is; let him know what Germany and France are doing to educate their people in every branch of productive work; let him know why India and Australia and Japan are our competitors, and let him know how to meet this competition. Then, with such a thorough understanding of the difficulties of his position as a merchant or manufacturer, he will secure himself by careful, intelligent attention to what he has undertaken to do. The worker in clay will not alone understand the process of manufacture necessary to a successful product, but he will consider the artistic side of his product, will know what is artistic when he sees it, and why, and will know where to look for the man to make the product a joy because it is beautiful. The manufacturer of textiles will know what is being done in Europe in his line, will know what importing countries want, will know how to get what they want to them at the lowest possible cost, instead of sending them, as so often happens now, what it pleases him to manufacture.

SPECIAL TRAINING NECESSARY TO SUCCESS.

Let us add to our school course a thorough, intelligently arranged technical course. It is not enough that a few trade schools are being supported by private enterprise. The school for clayworkers is a step in the right direction; our agricultural schools are other steps. They will send forth a limited number of specially trained young men who will do good work. But the movement must be more general. Every man or woman who enters upon any productive work must be specially prepared for his work by the schools at his door. When this condition is universal, then we shall be on the road to permanent prosperity. Then a faulty financial system could not

cripple the entire country. Nor, with the added intelligence of a broad outlook, would we allow such a system. The good of the country is the good of the individual. We must be more liberal in our interest in the general industries of the Nation and more intelligent in our own especial work.

Said an intelligent German the other day, after several years' residence in this country: "The peculiarity of the average American is that he is certain he knows all about a subject when he has only attacked one side of it. This gives him a confidence in himself which leads to great activity in business pursuits, but which induces tremendous mistakes." Let us teach the present generation of children the necessity of knowing "everything of something and something of everything;" that is, let us give them special technical instruction and a broad, catholic outlook.

A GOOD MAN STILL WRONG.

Following up the lead made by Mr. Batley, the insincerity and inconsistency of which we exposed in our last issue, our juvenile contemporary comes from behind its mask and openly attacks the Secretary of the N. B. M. A., charging that he, for his own personal gain, connived with the managers of the Tift House to impose an excessive rate upon those who attended the Buffalo Convention.

We hardly think it is necessary for Mr. Randall to deny this charge, which is not backed up by a scintilla of evidence, but is simply a bald, unsupported assertion. Some unmentionable has informed them, they say, that somebody else found out that Mr. Randall was offered "free quarters for himself, his wife, his daughter, his mother-in-law and his stenographer," and other inducements—which he didn't accept—hence the claim that Mr. Randall was bought up by the Tift House. This is the veriest of bosh, and will not, we feel sure, be seriously entertained for a moment by any member of the N. B. M. A. or those who know him. But for the benefit of those who do not know Mr. Randall, and may, on that account, be deceived by these charges, we pronounce them unqualifiedly false. Any person who states or claims that Mr. Randall has been influenced in this matter in the least by an improper or mercenary motive is either an ignorant or a malicious falsifier.

The Tift House was selected as headquarters on the advice of the local committee, composed of President Brush and Messrs. Swegles, Kirkover, Schmidt and Almendinger, not one of whom had any pecuniary interest in the matter whatever. The rates of \$2.50 and up were named in every announcement prior to the Convention, and those who asked for the minimum rate were accommodated at \$2.50 a day. We are in no sense the apologist of the Tift, and if we knew of any imposition practiced upon any member of the N. B. M. A. would unsparingly denounce it as such. We do believe, though, in giving credit to whom credit is due, and are free to say that we believe the N. B. M. A. never stopped at any hotel where the management tried harder to please our members than did the Tift. On this score we are willing to let the members speak for themselves, as several have already done.

The motive of our contemporary is plain to those who will read between the lines, and of itself will condemn them in the estimation of all fair-minded readers. The malice of the thing is clearly shown by their dragging into the mess the names of Mr. R.'s whole family, even to his mother-in-law, just why we are at a loss to understand, for that good soul has never attended a Convention. Not because she would not be welcome, be it said, for she is one of the sweetest and most lovable women man ever called mother.

Mr. Batley, in his reply, pleads the baby act, and says we have not treated him fairly. He must have a peculiar code of ethics who justifies himself in the use of innuendo and false accusation, and then cries shame when exposed, and we submit, in all fairness, that the evidence given in our former issue fully justifies our remarks. What makes Mr. Batley's course inexcusable is that his "kick" was premeditated. The scheme was

concocted at Galesburg, during the Illinois Convention, two weeks before we went to Buffalo, Svengali to the contrary notwithstanding, and, unless we are badly mistaken, will prove a boomerang. Mr. Batley and his Svengali repeatedly state that there was universal dissatisfaction with the Tift House. Excepting these worthies themselves, every member who has so far expressed an opinion says the service was good, and the list includes ex-Presidents Adams, Eggers, Purington and others. Does our contemporary mean that these gentlemen don't know good hotel service, or that they have not expressed their honest opinion? We pause for reply.

AN OBJECT LESSON.

In another column is given an account by a student of an excursion from the department under Professor Orton, of the Ohio State University, to various clayworking plants. It is this practical education which will do much for this country. The young man in the schoolroom who knows exactly what he must do with the knowledge which is being acquired will make better use of his time. Abstract facts and formula are difficult of retention by the memory of any one. When a fact has certain definite relations to other facts, then the memory takes to them naturally. It is very difficult for us to remember anything unless it has definite relation to something else. Probably the most difficult thing a boy or girl ever has to learn is the multiplication table; that is mere abstract work; but when one is studying technical clay work, for instance, his information is more readily retained if he is able to go out into the practical field, see just what is being done, and the relation which the schoolroom facts bear to the practical facts. Technical education and manual training form a new light in this world. The burden of education or of being educated will rest much more lightly on the students of the future than those of the past. In addition to special education, he will have his formula and facts constantly illustrated. Most of us remember that our school work was drudgery, but as we see the school work conducted at the present time under the new methods we see that there is enthusiasm attached to it. Hence great interest and great progress. The foreign schools carry this idea of practical education into all lines, not alone into cooking in a domestic way, but, absurd as it may seem, into laundry work and all branches of housekeeping. This illustration is mentioned to indicate the extremes to which practical education is being carried abroad.

SOME INTERESTING STATISTICS REGARDING STRIKES AND LOCKOUTS IN THE BRICK TRADE.

The following interesting statistics relating to strikes and lockouts in the brick trade of the United States have been obtained from the Bureau of Labor, and are for the years 1887 to 1894, inclusive:

The definitions of a strike and of a lockout, as given by the Commissioner of Labor, are as follows: A strike occurs when the employees of an establishment refuse to work unless the management complies with some demand. A lockout occurs when the management refuses to allow the employees to work unless they will work under some condition dictated by the management. It appears, therefore, that these two classes of industrial disturbances are practically alike, the main distinction being that in a strike the employees take the initiative and in a lockout the employer first makes some demand and enforces it by refusing to allow his employees to work unless it is complied with.

—Strikes.—

The total number of strikes among the employees of brick-making plants during the years 1887-94, inclusive, was 72, of which 35 were ordered and 37 unauthorized, involving 406 establishments, in 113 of which the strikes were successful, failing in 233 and partially succeeding in 60, with losses to the strikers of \$812,918 and to the employers of \$284,218. The total force

employed was 26,670, of whom 8 were females; total number of beneficiaries in whose behalf the strikes were inaugurated, 18,713; total number of strikers, 20,596; total number thrown out of employment during strikes, 21,831; total number of new hands employed to fill places vacated by the strikers, 1,932.

SAWDUST FOR FUEL.

A peculiar inquiry, not a little out of the ordinary, was received recently by the American Clayworking Machinery Company, of Bucyrus, from a business man of Saginaw, Mich. The request was for figures on a machine to mix and pug sawdust into shallow blocks, to be used on the market for fire kindling. The intention was to mix the sawdust with resin and oil, and, after a thorough mixing, to pass it to a brick machine to be pressed lightly into blocks about 12x18 in size, and then cut automatically into slabs an inch or two in thickness. The sawdust fire kindling of this kind is well known on the market, but the trouble has been that the price is too high. The Saginaw man figures that by taking the sawdust of several of the largest mills and handling it in large quantities he will be able to produce a fuel which may not be limited to kindling alone, but may, by making it more compact and lessening the cost of production, come within the realm of possibility as a fuel block. The machinery to produce this new idea in fuel will probably be made by the American Clayworking Machinery Company, as the plans furnished have been approved and the order placed conditionally, in case the factory is a go.—Ohio State Journal.

NEWS FROM ABROAD.

It is announced that a national exposition of ceramics (including all the kindred "arts of the fire") will be held at the Palace of Fine Arts, in the Champ de Mars, Paris, from May 15 to July 31 of this year. M. Georges Berger is President of the Executive Committee.

Work has begun on the new School of Decorative Arts at Limoges.

Some important experiments with gas for firing porcelain, etc., have been made recently at Limoges. The results appear to have been quite successful.

A ceramic exposition may be held at Bourges from May 15 to July 31 in connection with the agricultural meeting of that section.

PERSONAL MENTION.

In a recent letter, W. D. Palmer, President and General Manager of the Collins Brick Company, Atlanta, Ga., says he desires to purchase a second-hand dry pan, in good working order.

Mr. and Mrs. D. V. Purington, Chicago, went to Asheville, N. C., April 15, for a brief vacation. We have heard it stated that D. V. has purchased an interest in the Kennilworth Inn at that famous resort.

Spencer S. Kimbell, the well-known pressed brick manufacturer of Chicago, was elected Alderman of the Twenty-seventh ward at the recent election held in that city, being one of the few Republicans who escaped the landslide.

Allen county, Indiana, has thirty-five tile factories. Most of them have done but little the past few years. Mr. Ringwaldt, of Halls Corners, one of the pioneers in the work, paid us a visit in March, renewed his subscription to the Clay-Worker and reported a better prospect for trade for the coming season.

George R. King, Mexico City, Mexico, writes that the company with which he is connected is about to start a large plant for the manufacture of brick at Guadalajara, and want a good, sober, competent man, who has had experience in setting and burning, to take charge of the yard. He says they have a 10,000,000 contract to start with.

F. E. Losee, Newton, N. J., in renewing his subscription, says: "I think every number of the Clay-Worker is very valuable. We had a very good season last year, having made and sold over 1,000,000 brick. We were so unfortunate as to have our kiln sheds partly destroyed by fire recently, but managed, with the aid of the fire companies, to save that portion over a kiln of green brick without damage to the brick. The outlook is good for the coming season."

TABLE OF CONTENTS.

Chicago's Latest Architectural Achievement.....	329	Got His Money's Worth and More, etc.....	358
Brick vs. Steel Construction.....	331	Philadelphia Brick Manufacturers.....	359
Gold Brick.....	332	Can Brick be Enameled Without Burning?.....	359
German Notes.....	332	A Large Return.....	359
"Chemical Recipes".....	333	Burned Clay—Is it the Best Material for Fire-Proofing?.....	360
Big Value in Clay.....	334	A Change of Base.....	361
Ceramic Illustrations of Old Philadelphia Buildings.....	335	Way Down in Maine.....	361
The Market Question in Brick-making, etc.....	336	Bristol Glaze No New Thing.....	362
Brickmaking in the "Wild and Woolly".....	338	Detroit Items.....	362
Chemistry for Clayworkers—No. 51.....	338	Business is Much Better.....	362
Great Historical Pitcher of 1812-1814.....	341	Making Paving Brick in Washington.....	362
The Application of Water to Clays, etc.....	342	Bucyrus (Ohio) Notes.....	362
Down the Sunday Creek Valley.....	343	Down in Jersey.....	363
Terra Cotta Building Blocks.....	345	On the Pacific Coast.....	363
The Clayworking Industries of Victoria, Australia—No. 2.....	346	Traveling in Private Cars.....	363
Avanturine Glaze for Faience and Porcelain.....	348	Maine Brick and Building News.....	374
The Brickmaker's Graveyard.....	349	Trade Picking Up.....	374
The Simpson Dry Press.....	350	News from Ahroad.....	367
Had to Come to Detroit.....	350	EDITORIAL:	
A New Clay and Rock Crusher.....	351	Current Comment.....	364
German Qualifications of Good Brick.....	351	Better Times.....	364
John J. Moroney Honored.....	351	A Painful Object Lesson.....	364
First Meeting of the Committee on Technical Investigation.....	352	The Floods and Hard Times.....	365
The New York Market.....	353	Outside Affairs.....	365
Good Prospects for Philadelphia Brickmakers.....	355	The Folly of Light Brick Walls.....	365
Rubber Belt Conveyers.....	356	The Common Weal.....	365
Macon, Ga., to Have a Paving Brick Plant.....	356	The Survival of the Fittest.....	365
Ohio Valley News.....	357	The Importance of Little Things.....	366
A Pug Mill and Elevator Conveyor Combined.....	357	Special Training Necessary to Success.....	366
Obituary.....	357	A Good Man Still Wrong.....	366
CORRESPONDENCE:		An Object Lesson.....	367
Buttonhole Talks.....	358	Some Interesting Statistics Regarding Strikes and Lock-outs in the Brick Trade.....	367
An Absentee.....	358	Sawdust for Fuel.....	367
Ex-President Eggers' Experience and Opinion.....	358	Personal Mention.....	367
		Editorial Notes and Clippings.....	270
		MISCELLANY:	
		A New Clay Product.....	376
		Akron's Clay Industries.....	376
		More Activity in the Tile Business.....	378

BOOKS FOR BRICKMAKERS.

"CLAY GLAZES AND ENAMELS,"	
Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	
Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	
J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	
Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	
H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	
J. J. W. Billingsley,	1.00
Mailed, postage free, on receipt of price.	

T. A. RANDALL & CO.,
Indianapolis, Ind.

INDEX TO ADVERTISEMENTS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page.
Hilgeman H. B.	326	The Chisholm, Boyd & White Co.	320, 321
Progress Press Brick and Machine Co.	375	The American Clay-Working Machinery Co.	396, 397
Ross-Keller Brick Machine Co.	324	The Fernholtz Brick Press Co.	323
Simpson Brick Press Co.	322	Whitney, H. O.	326

Brick and Tile Machinery.

Adrian Brick & Tile Machine Co.	391	Stedman's Machine Works.	391
Anderson F'dry & Mach. Wks.	404	Steele, J. C., & Son	391
Baird & Son, H. C.	383	Schoellhorn-Albrecht Mach. Co.	318
Brewer, H. & Co.	378, 401	The American Clay-Working Machinery Co.	396, 397
Central Machine Works.	382	The Horton Mfg. Co.	402
Chambers Brothers Co.	317	The Eastern Machinery Co.	406
Craycroft Benj.	379	The Henry Martin Brick Mach. Mfg. Co.	405
Chicago Brick Machinery Co.	377	The Leader Mfg. Co.	393
Eagle Iron Works.	382	The Ohio Ceramic Engineering Co.	318
Freese, E. M. & Co.	400	The Turner, Vaughn & Taylor Co.	378
Frost Engine Co.	399	The Wallace Mfg. Co.	373, 407
Hensley, J. W.	380	The Wellington Machine Co.	371
Kells & Sons.	383	Williams Patent Crusher and Pulverizer Co.	325
Means & Co., Jas.	383	Wiles, A. M. & W. H.	390
Michigan Brick and Tile Machine Co.	385	Woolley Foundry & Machine Works.	403
Madden & Co.	377	Williams, White & Co.	393
Newell Universal Mill Co.	395		
Potts & Co., C. & A.	327, 392, 395		
Raymond & Co., C. W.	369		

Brick Kilns and Dryers.

Alsip, S. H.	387	Reppell, L. H.	387
Conley & Wolfe.	388	Sharer, Geo. W.	388
Cummer & Son Co, The F. D.	375	Swift, F. E.	387
Eudaly, W. A.	389	Thalson, A.	386
Leary, W. A.	384	The American Blower Co.	386
Morrison & Co., R. B.	389	The Fernholtz Brick Press Co.	323
Pike, E. M.	386	The Standard Dry Kiln Co.	328
Phillips, S. G.	387	Wolf Dryer Co.	408

Brick Yard Supplies.

Arnold, D. J. C.	394	Mey, F. H. C.	380
Buck, J. A.	383	Mershon & Co., W. B.	319
Coldewe & Co., G.	381	Newton, A. H.	381
Carnell, Geo.	390	Phillips & McLaren	385
Cox, Geo. S.	385	The Atlas Bolt & Screw Co.	392
Caldwell, H. W. & Son Co.	379	The Harrington & King Performing Co.	319
Carmichael, T. W.	379	Wagoner, M. V. B.	385
Hardin, Bailey & Church.	380	Walworth Run Foundry Co.	390
Marion Steam Shovel Co.	394		

Miscellaneous.

Associated Trade & Industrial Press.	384	Main Belting Co.	384
Balsley, G. S.	383	Oshorne, W. R.	383
Dean Bros. Steam Pump Works	382	Tennille, A. F.	384
Dover Fire Brick Co.	383	The E. W. Vanduzen Co.	384
Evens & Howard	385	The Encyclopedia Publishing Co.	398
International Correspondence Schools.	385	The Union Hardware Co.	381
Jackson, John H.	382	The Jeffrey Manufacturing Co.	384
Kendall & Flick.	382	The Rockwood Mfg. Co.	381
		Small Ads., Wanted, For Sale, Etc	

A BAD BRICKYARD ACCIDENT.

Chas. J. Weaver, a member of the firm of Weaver & Son, was fatally injured, early in the morning of April 11, by being caught in the brick machinery at the works of the firm in Baltimore, Md. Mr. Weaver was oiling the machinery, when his clothing caught in the cog wheel, and he himself was drawn into the wheels and terribly mangled before the machinery could be stopped. Mr. Weaver was fifty-eight years old, and had been engaged in the brick business for ten years. He was a man of great worth, reliable and conscientious in every respect. A wife and eight children survive him.

Success

Comes to Those Who use the Most Successful Appliances.

A Smiling Satisfaction. 

COLUMBUS, GA., March 25, 1896.

C. W. RAYMOND & CO., Dayton, Ohio.

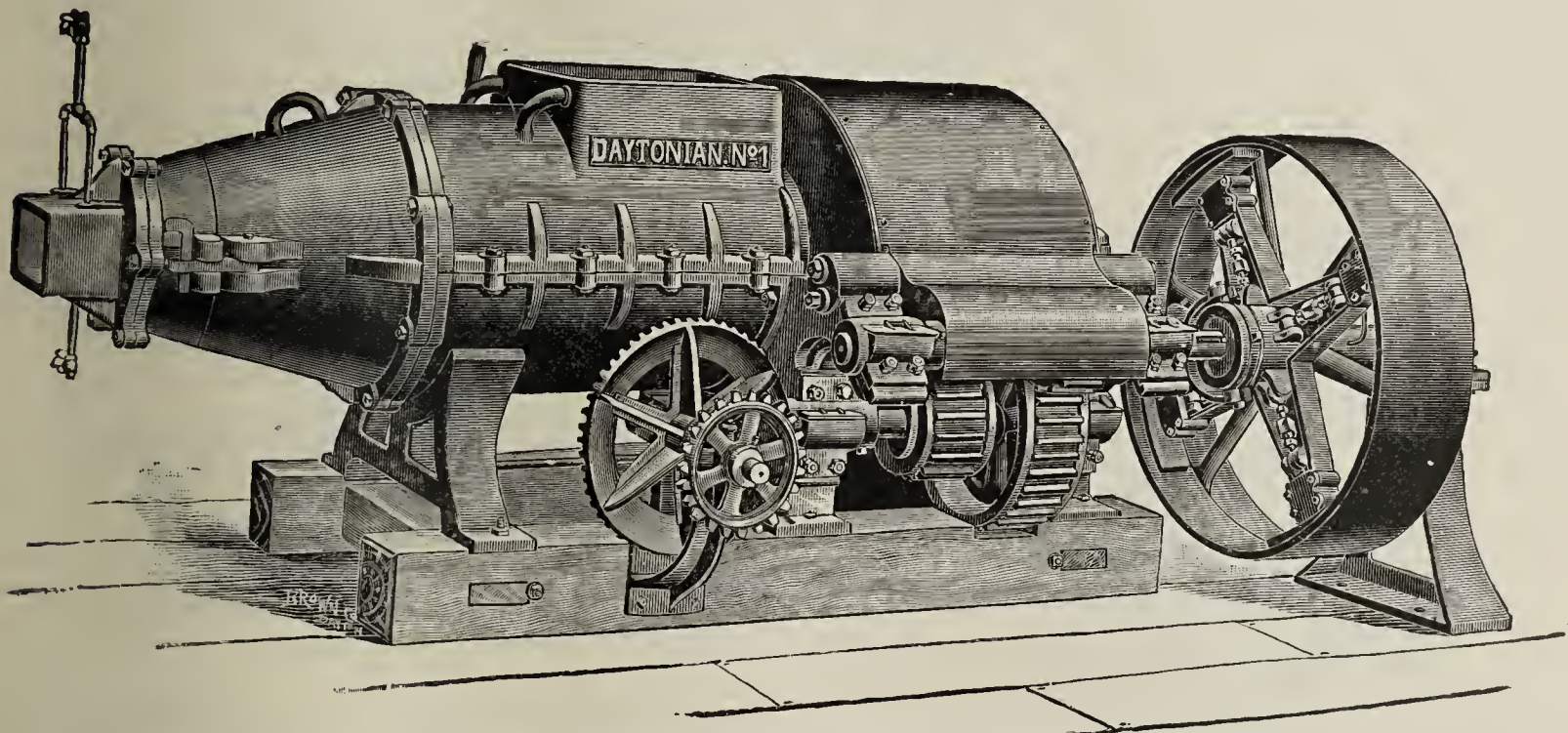
Gentlemen:—We are running the Brick Machinery purchased of you, and are delighted with its work. The Pug Mill tempers the clay and mixes it thoroughly. The Brick Machine turns out a first-class brick, smooth and square, and with well defined corners and edges. In fact it is just what we have needed for three or four years. We are now in a position to compete with any brickmaker in the country.

Your Daytonian No. 1, cannot be beat, and we take pleasure in testifying to its merits.

There are four other machines at work in our neighborhood. We would not exchange for any of them.

Very respectfully yours,

SHEPHERD BROS.



NO. 1 DAYTONIAN BRICK MACHINE.

COLUMBUS, GA., March 4th, 1897.

C. W. RAYMOND & CO., Dayton, Ohio.

Gentlemen:—We have never sent a check to any one with more willingness and pleasure than we do this one, because we feel and know that we have full value received in the machinery we have bought of you. We have been running the full outfit, viz.: the No. 1 Daytonian and No. 2 Pug Mill, Disintegrator, Elevator and Triumph Side-cut extension off-carrier table just one year and we can truthfully say that we are fully satisfied.

Everything runs smoothly and the way the machine turns out brick is simply beautiful—we are using six off-bearing trucks and it keeps them very busy to take the brick out of the way. We are "in the swim" now and if you do ever come to Columbus, come out to see us and we will show you one of the prettiest little brickyards anywhere in this State.

Very respectfully,

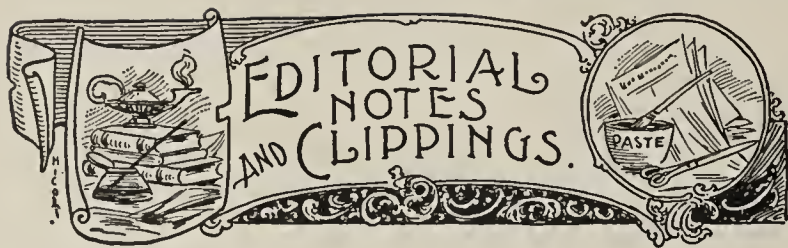
SHEPHERD BROS.

The above firm is only one of the many who say that Raymond Machinery is the most successful on the market.

C. W. RAYMOND & CO.,

Send for our 1897 Catalogue.

DAYTON, OHIO, U. S. A.



T. G. McGraw will establish brick works at Gaffney, S. C.

J. E. McCarty will manufacture brick at Clayton, Ill., this season.

W. H. Dillon will start a brick plant at Maxwellton, near Hightstown, N. J.

A. Simmons, formerly of Nova, O., will operate a brick and tile plant at Tiffin, O.

Tobias Bros. & Co. are making extensive alterations in their plant at Hamburg, Pa.

S. J. Harris & Co. have purchased the brick plant of R. E. Curns & Co., at Adel, Ia.

A brickyard in which C. C. McClaren is interested will be established at Smithfield, O.

Guy Coffey, Woodstock, O., advises us that he is in the market for a horse-power tile machine.

J. H. Kelly, of Water Valley, Miss., has installed a Martin horse-power machine on his new yard.

Geo. W. Read wants to buy brick and clay trucks. His address is Monroe House, Abbeville, Ga.

T. W. Carmichael, Wellsburg, W. Va., reports having sold seven of his clay steamers this season.

A. W. Hanna, Turkey Creek, Ind., advises us that he is desirous of purchasing a complete tile outfit.

W. J. Riggs and C. G. Sheller, of Muncie, Ind., contemplate erecting a flower pot factory at Albany, Ind.

Joe A. Smith, of Annville, Pa., has just purchased a latest improved Martin horse-power brick machine.

The North Canal Brick Company has been incorporated at Calumet, Mich., with a capital stock of \$30,000.

Arthur Johnson, a well-known brick manufacturer and contractor of Omaha, Neb., died in St. Louis April 1.

Messrs. Blair & Pender, of Napoleon, O., have selected the Martin steam-power machinery for their new plant.

The death of Barthel Hellrung, a well-known brick manufacturer of Liberty Prairie, Ill., occurred March 14.

Jas. R. Miles has purchased a brick plant at Kennet Square, Pa., and says he will make building brick there this season.

Dearborn Bros. & Co., of Lynn, Mass., have purchased the brick plant of the late Eben Smith, at Newburyport, Mass.

The Alvin (Tex.) Brick and Tile Works are equipping their plant with improved machinery, preparatory to a busy season.

W. L. Harley has leased the Orangeburg (S. C.) Brick and Tile Plant, and will operate same on an enlarged scale the coming season.

Owing to the growing demand for brick, the Algoma Brick Company, Rat Portage, Ont., will improve their plant, thereby increasing the capacity.

Wm. McMahon, Troy, Ind., wants to buy a second-hand Old Reliable brick machine, or some other equally good make of hand machine.

R. H. Stanley has purchased the brickyard of Morgan & Sons, near Kennett, Mo. Mr. Stanley says he expects to burn and sell a million brick this season.

Wm. C. Burke has purchased his old brickyard at Macomb, Ill., again, and will make repairs and improvements in same, preparatory to running it this season.

G. F. Hapner writes that he is starting a plant at Shelby, O., for the manufacture of common brick by the soft mud process. He expects to use the pallet system.

W. H. Matthews advises us that he will start a small plant for manufacturing common building brick at Ada, Minn., and that he is in the market for soft mud machinery.

The Lehman-Kohlsaat Clay Company has been incorporated at Chicago, with a capital stock of \$50,000. The incorporators are P. N. Kohlsaat, Geo. W. Rodgers and F. Heiss.

Milo Sprang is putting in a boiler and engine at his tile factory at Poe, Ind., and making other improvements that will enable him to turn out an increased number of tile this season.

Peter E. Spurek, of the firm of Spurek Paving Brick Com-

pany, Peoria, Ill., died at his home in that city March 24. Mr. Spurek was sixty-six years of age, and had lived in Peoria nearly all his life.

D. F. Nyman has leased the brickyard of S. Hoke, Jr., at Millville, W. Va., for twenty-five years, and will commence operations at once.

Pierce, Lane & Co. have purchased the complete brick plant of the Franklin Company, at Lewiston, Me., and are making arrangements to operate same in the near future.

C. W. Raymond & Co. write that the wave of prosperity has finally reached Dayton. They are again working full force in their shops, and have made more shipments than for several seasons.

Anders C. Jensen, Canon City, Col., in a recent letter, says if the movement on foot to compel the penitentiary to stop manufacturing brick is successful he will increase his capacity and put in new machinery.

Allison Bros., Banta, Ind., advise us that they have just started up their brick plant. At present they are running a small hand yard, making brick, but they expect to manufacture tile also next year.

The Brick and Terra Cotta Company's plant, at Bucyrus, O., is still idle, and there seems to be no immediate prospect of getting it started. There is a good opening here for some enterprising, managing person.

Through a trade Albertson Bros. have come into possession of the tile factory at Wolcott, Ind., formerly operated by Gerard Bros. They do not intend to run the plant themselves at the present time, but will lease it.

J. G. Neff has concluded to retire from active business, and has sold his interest in the brick and tile works at Bryan, O., to his sons, Will, George and Charles, who, with Frank, already a partner, will continue the business.

Fell & Reichart write us that they are the successors of the late Peter Fell, and that they are quite busy at present. Their plant has a capacity of 40,000 daily. Messrs. Fell & Reichart add that they find the Clay-Worker full of interesting matter.

Dunnavent & Williams, Clinton, Ky., are in the market for a dozen trucks to put under a rolling roof for a brick kiln. Their kiln shed is fifty feet long, thirty feet wide, and they would like to hear from parties who can furnish same at once.

The Ohio Ceramic Engineering Company, Cleveland, O., have received an order for another Richardson repress from the Sayre & Fisher Company, Sayreville, N. J. This is the third Richardson repress furnished Sayre & Fisher Company within a year.

The Ingleside Brick and Manufacturing Company, of Somerset, Pa., has sold all of its machinery to the Johnstown Manufacturing Company, and will retire from business. The latter firm anticipates a very busy season, having a large number of orders now on hand.

Geo. W. Smith, a prominent brick manufacturer of Dutchess Junction, N. Y., died at his home March 23. Mr. Smith had one of the best brick plants along the Hudson river, being equipped with improved machinery. He had been engaged in the brick business for many years.

C. W. Soule has purchased the interest of J. M. Funk in the Webster City (Ia.) Brick and Tile Company, and is now sole owner of the yard. He will enlarge the plant and otherwise improve his facilities. This plant is now one of the largest and best equipped brick and tile plants in Iowa.

The large brick plant of Miller & Rinehart, at Roachdale, Ind., was completely destroyed by fire March 26. The plant had not been in operation very long, and Messrs. Miller & Rinehart, so far, have not decided whether they will rebuild. The fire is thought to have been the work of incendiaries.

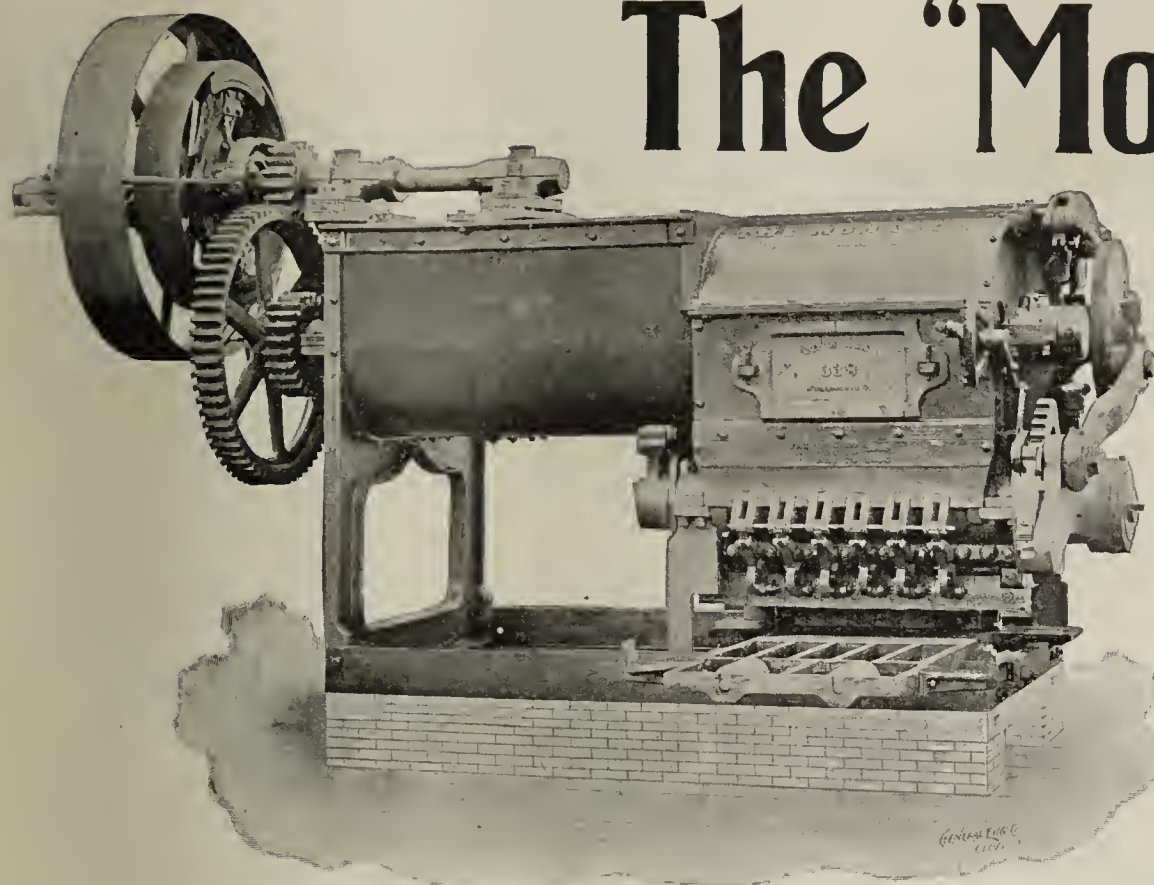
E. & W. Doyle, miners and shippers of hard and soft fire clay, are in the market for machinery for grinding and pulverizing fire clay. They also desire us to state that they are prepared to furnish ground clay in any quantities. Their address is Truesdale, Mo.

Arrangements have been completed between the C., H. & D., L. D. & W. and Wabash Railways, by which mileage tickets of either of these lines will be accepted for passage between Indianapolis, Decatur, Quincy, Hannibal and intermediate stations over these three lines.

St. Petersburg, Russia, has been added to the large list of prominent foreign cities into which the famous Henry Martin brick machines have been introduced. A cablegram reached the Henry Martin Brick Machine Manufacturing Company, of Lancaster, Pa., a few weeks ago, instructing them to prepare for immediate shipment one of their latest improved steam-

[CONTINUED ON PAGE 372.]

The "Monarch"



(Horizontal,
Double Pug Mill,
Double Press.)

... and ...

—• THE •—

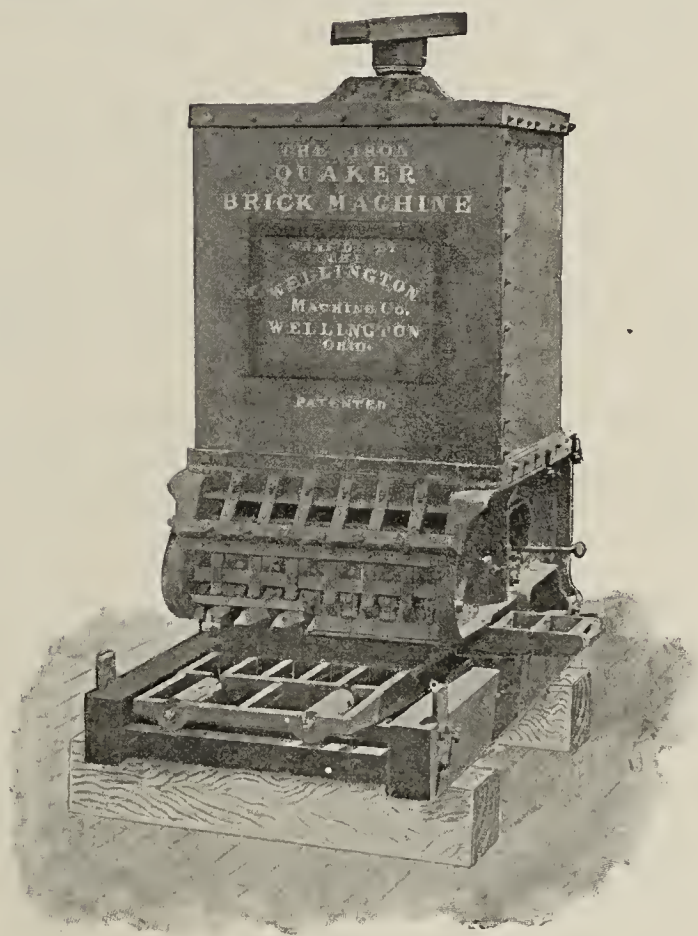
"Iron Quaker" Brick Machines

Lead the "Sand-Moulding" Class.

AUXILLIARY
MACHINES
AND . . .
SUPPLIES.

Pug-Mills, Disintegrators, Crushers,
Mould - Sanders, Represses, Winding
Drums, Dump Cars, etc., Moulds, Dump
Tables, Dryer Cars, Kiln Doors and Cast-
ings, Elevators, Dump Carts, etc., etc.

Ball-Bearing Brick Barrows and Trucks.
No one else makes them.



FOR SALE.

Odd sizes of moulds. Have not been used.

5 moulds, $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
20 moulds, $8\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 in. partitions.

Second-hand, but used a few days only.

10 moulds, $9\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
19 moulds, $9\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{3}{4}$. " " "

The Wellington
Machine Co.,

WELLINGTON,
OHIO.

Send
for
Circular.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

power brick machines, in connection with horizontal pug mill, clay crusher, elevator and mold sander, together with all necessary attachments. The instructions by mail have just been received, and the machinery will soon be on its way.

It is with regret we announce the death of Henry Dietschler, Sr., which occurred at his home March 8. Mr. Dietschler was the senior member of the brickmaking firm of Dietschler & Sons, of Buffalo, N. Y., and had been engaged in making brick for almost a half century.

The C., H. & D. Railway has been granted permission by the Central Passenger Committee to sell excursion tickets to Detroit, Mich., to members of the National Association of Stove Manufacturers, May 11 to 15, also to Cleveland and return on account of the Ohio State Medical Association.

A clay bank at the works of the Maryland Clay Company caved in April 1, burying beneath it two employes. Other workmen saw the accident and at once went to their rescue. One of the men was badly, and, it is feared, fatally, injured, while the other one was dead when his comrades reached him.

Two workmen were seriously injured in an accident which occurred at the Delaware (O.) Clay Works recently. The trap door which guards the clay chute gave way, precipitating a carload of clay and stone on the men in the pit below. Both men will recover.

Amos H. Potter, one of the most prominent business men of Gardiner, Me., died suddenly of apoplexy March 14. He had been in his usual good health until within a few hours of his death, so that the news of his demise was a shock to his family and many friends. Mr. Potter was the proprietor of the Worrell brickyard.

The Deans (N. J.) Brick and Tile Company has been incorporated by Isaac D. Gabel, George M. Carslake, J. Holmes Longstreet and Albert Taylor, of Bordentown, and Samuel K. Wilson, Archibald Updike and D. Foster Updike, of Trenton. The company will manufacture brick of all varieties at Deans. The capital stock is \$100,000.

The Ohio river at Cincinnati reached the stage of sixty-one feet and four inches, and blocked all the railway lines except one, and this one was the C., H. & D. Railway. It is known as the "high and dry" line. During the flood all trains arrived and departed from the depot, at Fifth and Baymiller, Cincinnati, with unfailing regularity.

Geo. F. Cotton writes us that C. H. Heineman, of Falls City, Neb., has leased the immense plant of the Table Rock (Neb.) Vitrified Paving Brick Company for the season of 1897, and will have same put in operation at once. Mr. Cotton, who built the plant, will have entire charge of same, which will have a capacity of 50,000 per day.

E. M. Freese & Co., Galion, O., report trade fairly satisfactory. They recently shipped outfits of machinery to Ohio, Pennsylvania, New Jersey, Illinois, Iowa, Missouri, Tennessee, North Carolina, Alabama, Georgia, Louisiana and Texas. They feel that in view of the condition of trade in other lines throughout the country they have no reason to complain.

The Batavia Challenge Brick Company, Cincinnati, O., write that they contemplate changing their manner of burning from coal and wood to crude oil, and would like to correspond with brick manufacturers who have used or are now using oil. They would also be pleased to have parties who can furnish oil burners send them circulars and quote prices. Their address is Room 3, Builders' Exchange.

H. O. Keener, of Middletown, Pa., in inclosing subscription for Clay-Worker, says that in all probability he will operate the brick plant this season which was formerly run by J. C. Keener & Son, and which has been comparatively idle since the death of J. C. Keener, some five years ago. Mr. Keener closes his letter by saying: "I would not be without your Clay-Worker, as I think it is the best trade paper published."

Mr. Henry D. Shoonmaker advises us that he has purchased the plant of the Selden Brick Company, Erie, Pa., and changed the name to the Lake Shore Brick Works. Mr. Shoonmaker has been Manager of the plant for the past two years and has the business in excellent running order. I. M. Justice, well known to clayworkers generally, and those of Ohio in particular, having served a number of years as Secretary of the Ohio Clayworkers' Association, is in charge of the works. The outlook is good for a busy season.

The reorganization of the Christy Fire Clay Company, necessitated by the death of Mr. J. B. Clements, has been effected, as follows: Mr. Calvin M. Christy, as President, will continue to shape the policy of the company. Mr. Chas. T. Farrar has been made Vice President. Mr. W. C. Morris, formerly Secretary and Treasurer, has been made General Man-

ager, and will retain the office of Treasurer. Mr. Franklin P. Jones, for many years Cashier of the St. Louis Trust Company, succeeds Mr. Morris as Secretary, and Mr. R. D. Hatton has been promoted to the position of Assistant Secretary.

The Mount Diablo Pottery Co-operative Company, of Antioch, Cal., will soon commence tiling on a fifteen-acre tract of land, which has heretofore been valueless, but, with tile drainage, will produce excellent results. This system of drainage prevails to a great extent in the East, with satisfactory results, and if introduced here many pieces of unproductive soil would yield good crops of various kinds.

Among the many manufactories that have sprung into life in Los Angeles, Cal., during the advancement made by that city in the past few years, is that of brickmaking. Excellent clays for the purpose are found in the greatest abundance in the city and vicinity, and are quickly and economically converted into brick. Nearly three hundred laborers have been employed by the fifteen brickyards of Los Angeles during the past year, and they show as a product of their labor about 30,000,000 brick, of the value of \$150,000.

If everybody down South is as busy as Jno. W. Sibley, Treasurer of the N. B. M. A., of Birmingham, Ala., that section must be booming. He writes that he "has been rushed to death ever since the Buffalo Convention. Have contracts on hand for several million pavers for Montgomery, with a number of other contracts equally large in view, and are rushing things full tilt. Building seems to be on the up-grade in this section now, but we are too busy on pavers to make building brick, except on orders for buff and high grade fronts."

The city of Spokane, Wash., has received advice from various sources regarding the paving of its streets. The City Engineer of Seattle writes: "Our vitrified brick gives a good pavement, clean and satisfactory. If I were experimenting, I would try a block of wood pavement, burnettizing the wood and dipping it in tar. I would place principal stress upon the burnettizing." The amount laid and cost of pavement in Seattle, as given, were as follows: Cedar blocks, 1,144 square yards, at \$2.75 per square yard, including granite; brick, 45,937 square yards, at \$2.95 per square yard, including granite curbs. Brick is generally favored.

Col. R. D. Hunter, the wealthy coal mine owner of Fort Worth, Tex., James Green, President of the Laclede Fire Brick Company, of St. Louis, and Moses Rumsey, of the L. M. Rumsey Manufacturing Company, St. Louis, have organized the Green & Hunter Brick Company, of Fort Worth, Tex., James Green being the President. They have bought of the Ross-Keller Brick Machine Company three six-mold machines, and are pushing everything to get their plant in operation. They have the very finest shale, two to three hundred feet in depth, running over many square miles of territory. This bids fair to be the finest pressed brick plant ever put up in the South.

Under date of March 23, Mr. C. H. Sawyer writes that a company in which he is interested will soon be organized at Aransas Pass, Tex., for the manufacture of brick. Mr. Sawyer says: "The following is a memoranda of machinery, etc., needed for the plant: 100-horse-power engine and boiler; one each, wet and dry pan, new pattern; stiff mud machine; automatic cutting table, with extension belt; Brice 10-inch pug, steel shell, double gear; one two-track drier; No. 8 steel pressure blower; several elevators and revolving screens; three transfer cars; thirty trucks, 40 inches by 7 feet; furnace castings; doors; 16-pound T rail; 200,000 common brick; 50,000 fire brick, and 200 barrels of lime. The plant will cost, when completed, about \$20,000, and will have a capacity of 40,000 brick per day. In addition to a Superintendent and office force, the plant will employ one engineer, five fire or furnace men and fifteen laborers, and will consume fifteen tons of coal per day."

The Pacific Clay Manufacturing Company, with headquarters in Los Angeles, is one of the largest manufacturing enterprises in southern California. It has successfully manufactured vitrified pipe from material obtained from the Temescal mountains, near Elsinore, Cal. Orders for this class of pipe were formerly sent East. They own varied and extensive clay beds, and from them manufacture a fine quality of brick and terra cotta. One of the most important contracts handled by this company was that for the Santa Paula Company of a twenty and twenty-two-inch pipe, several miles long, which passed up hill and down dale, and was to stand a water pressure of twenty-five feet, or about twelve pounds to the square inch. The line was tested when completed, and was found to be a success. The officers of the company are: W. A. Bingham, President and General Manager; G. S. Baldwin, Vice President; L. S. Porter, Secretary. The National Bank of California is its Treasurer. When operated to a fair average capacity the Pacific Clay Manufacturing Company employs about forty-one men and disburses between \$60,000 and \$70,000 per annum in wages. Its annual product is then in the neighborhood of \$200,000.

BRICK MACHINERY

Wonder No. 4.

Capacity, 60,000 to 100,000 per day.

Big Wonder.

Capacity, 50,000 to 60,000 per day.

Intermediate Wonder.

Capacity, 25,000 to 40,000 per day.

Little Wonder.

Capacity, 20,000 to 25,000 per day.

BRICK CUTTERS

Cunningham's Side Cut

Automatic Cutter.

Cunningham's End Cut 3-Stream

Automatic Cutter.

Cunningham's End Cut 2-Stream

Automatic Cutter.

Cunningham's End Cut 1-Stream

Automatic Cutter.

Side Cut Broad Delivery Table.

Side Cut Hand Brick Cutting Table.

End Cut Hand Brick Cutting Table.

Combination Side and End Cut

Hand Brick Cutter.

PUG MILLS

No. 3, Plain Closed Top Pug Mill.

No. 3, Open Top Pug Mill with Wallace Patent Cleaner Teeth.

Tempers clay for 75,000 to 100,000 brick per day.

No. 2, Open Top Pug Mill.

No. 2, Closed Top Pug Mill.

Tempers clay for 35,000 to 50,000 brick per day.

No. 1, Open Top Pug Mill

No. 1, Closed Top Pug Mill.

Tempers clay for 25,000 to 35,000 brick per day.

No. 1, Wallace Patent Pug Mill.

No. 2, Wallace Patent Pug Mill.

Tempers clay for 20,000 to 40,000 brick per day.

DRAIN TILE MACHINERY

Little Wonder Makes 3 to 12 inch.

Capacity, 8,000 to 12,000 4-inch daily; others in proportion.

Intermediate Wonder Makes from 3 to 18 inch.

Capacity, 10,000 to 15,000 4-inch daily; others in proportion.

Drain Tile Cutting Tables for large and small tile
Trucks for Handling Large Tile.

Reversing Device for large tile.

Platform Spring Barrows.

CLAY PREPARING MACHINERY

Clay Screens.

Dry and Wet Pans, 6, 8 and 9 feet, with wood
and iron frames.

CLAY CRUSHERS and STONE SEPARATORS of
many designs and capacities to suit
conditions.

CLAY CRUSHERS with and without clod
breakers.

CLAY CRUSHERS mounted on legs.

CLAY CRUSHERS low down.

CLAY CRUSHERS compound 4-roll.

CLAY ELEVATORS all lengths and widths
to suit your desire.

DRY CLAY BUCKET ELEVATORS of length and
breadth to suit desires.

Friction Hoist Drums.

Friction Geared Hoisting Drums.

Clay Cars. Truck Wheels and Axles.

Kiln Doors and Frames.

Kiln Doors without Frames.

Wheelbarrows for Brick and Tile.

Brick Pallet Spring Trucks.

Engines. Boilers. Pumps.

Shafting. Pulleys. Hangers,
Couplings, Journal Bearings and
Belting, both Rubber and Leather.

Look Down the Line



We are prepared to furnish any and every appliance needed in an up-to-date Brick or Tile Plant. Let us QUOTE you prices. It will only cost you two cents, and may save you MANY DOLLARS.....



Wallace Mfg. Co.

Frankfort, Indiana

See back inside cover page.

MAINE BRICK AND BUILDING NEWS.

AT ASHLAND, Aroostook county, the present terminus of the Bangor & Aroostook Railroad's western branch, the Ashland Manufacturing Company has completed one of the largest sawmills in the country. It will, when fully completed, saw from 150,000 to 200,000 feet of lumber per day. The mill is situated on the Aroostook river, and in the heart of a tract of timber belonging to the company, the yearly growth on which is estimated at 75,000,000 feet of spruce. This lumber was formerly driven down the Aroostook river to St. John, N. B., and manufactured there. It will now go to the saws at Ashland, and pass to Bangor, Boston and other markets by way of the B. & A. road, through United States territory all the way. This great mill is to be followed, it is said, by a mammoth sulphite pulp mill, to be built of brick. The clay for making the brick crops out on the company's land, and machinery will be put in for the manufacturing of bricks on an extensive scale, if present prospects are fulfilled.

The brickyard at Sherman Crossing, Aroostook, which lay idle last year through the financial embarrassment of the proprietors, will be opened this year. M. and J. D. Leen are making arrangements to manufacture 300,000 bricks there. The clay is a hard gray deposit, four feet in depth, rising 2½ feet above the bed of Little Molunkus stream, which runs through it. There is much quicksand.

The Maine Legislature has granted the necessary assistance for the building of bridges at St. Francis and Van Buren across the St. John river, and now the Temiscovata Railroad is expected to cross into American soil and join the B. & A. Railroad at Caribou, thereby linking the Grand Trunk and the B. & A. Van Buren considers this the signal of her release from bondage, and her representatives say she is bound to become a thriving city. One of the needs most felt is a brickmaker who will set up a plant in the clay bank near the village.

Brick as material for small sewers has again displaced carbonized cement drain tile in Bangor.

Worcester, Mass., is agitating the better streets question, and brick paving has many champions. There is a fat field for missionary work in Worcester. Her street paving is awful to contemplate.

Old Town, Me., thinks it could give a good brickmaker a fair living if he would locate and make bricks there.

Patten, Me., has been reached by a branch of the Bangor & Aroostook Railway, and her business men think that there ought to be good money for a brickmaker in her excellent clay banks along the line of the road. Patten is the most northerly town in Penobscot county.

Orland, Me., brick manufacturers complain bitterly of the treatment accorded them by Boston commission merchants and dealers. They claim that the commission merchants bunco them in the interests of the combine; that they do not get the prices promised previous to consigning, and that when not frightened out of the market by the men on whom they were wont to rely for faithful reports of the conditions of affairs, they are robbed in the count and cheated in the culling. As the Orland men live entirely on the Boston market, they will probably unite and pay a sufficient sum to keep one of their own in Boston at all times. The outlook for Orland yards the coming season is not encouraging. Nearly every brickmaker is a farmer, and the prospects are that there will be more potatoes and beans and fewer bricks produced there than for many seasons.

TRADE PICKING UP.

The past year has not been noted for its prosperity in any line of business, much less the clayworking industries, yet it is a pleasure to note that business is improving, as is shown by the following improvements made in various plants by the addition of machinery of the American Clayworking Machinery Company's make:

The Cedar Falls (Ia.) Brick and Tile Company has ordered a complete outfit of stiff mud machinery, and will be fully equipped to take care of its splendid trade.

An order from Bruno Pechstein, at Medford, Wis., calls for an upright stock, sand mold, brick machine and outfit.

The progressive firm of Laughery & Humphries, of Fair Chance, Pa., has placed an order for a stiff mud outfit for the manufacture of fire bricks.

E. Meigs, of Moultrie, Ga., has been shipped a plunger machine and outfit.

The Iola (Kan.) Brick Company has placed the largest order which the trade has known for several months. The order calls for a double plant, one for the manufacture of paving

brick and the other for dry press brick. The order is a generous one, and shows that the Iola people are progressive and intend to do their share of business.

The Mechanicsville (N. Y.) Brick Company has ordered a stiff mud outfit for the manufacture of the celebrated "Haverstraw brick."

S. E. Comes & Sons, of Mechanicsburg, Ill., have placed an order for an upright stock sand mold brick outfit.

John Dressel, of Lebanon, Pa., has ordered a special crusher.

After extensive investigations in the line of driers and disastrous experience in the use of some, the Superior China Clay Company, of Hersey, Wis., has contracted with the American Blower Company, Detroit, Mich., for one of its improved driers of large capacity.

SOUTHERN TRADE NOTES.

The new plant of the Alvin (Tex.) Brick and Tile Works is rapidly nearing completion, and it is expected to have the works in operation by the middle of May at the latest.

Harrisonburg, Va., capitalists have incorporated the Forestwood Pottery Company, with a capital stock of \$50,000, and Leo Forester is President. The plant of the old Virginia Pottery Company has been secured, together with valuable clay lands, and all kinds and grades of pottery will be produced.

The several factories of the Mack Manufacturing Company, at New Cumberland, W. Va., have resumed, after several weeks' idleness, largely occupied in necessary and important repairs.

John Crowell, of Big Stone Gap, Va., is preparing to test the pottery clays of that section, and will burn a kiln of ware this month. The clays are abundant, and success in these experiments may induce the establishment of a mammoth plant, as the surrounding territory offers exceptional inducements.

Paag Bros. & Co., of Centerville, Md., are equipping a brick works that is expected to have a capacity of not less than 15,000 per day.

The Wheeling (W. Va.) Pottery Company has been extensively improving its plant the past few weeks, adding, among other features, an admirably equipped laboratory.

Under the new process of jugmaking invented by Manager Berry, of the Daisy (Tenn.) Pottery Company, the plant is expected to increase its average output to 10,000 per week. The plant but recently resumed, after two months' idleness.

The Central City (W. Va.) Brick Works will resume shortly, after a winter's idleness, having secured contracts for several hundred thousand red brick from different West Virginia points, one of the largest being for the Williamson, W. Va., courthouse.

The Clarksburg (W. Va.) Brick Company has placed a large order with the Shetter Machine Company, of Steubenville, O., for patent tunnel brick drier and iron cars, and are preparing for an unusually heavy season's run.

It is estimated that the pottery and brick works of the upper Ohio valley have given employment to three thousand men, the past month, that were previously idle.

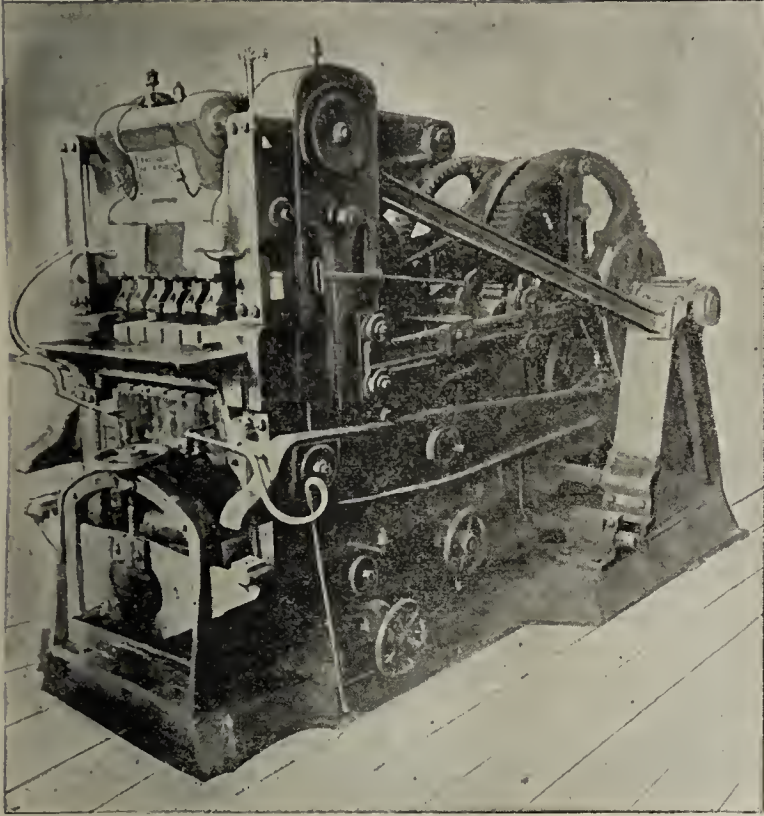
The clay mines of the Camden (W. Va.) Clay Company are being rapidly opened and the extensive works being rapidly pushed to completion. The machinery is nearly all in place, and, barring the kilns, the plant will be ready for operations by the first of May. They will manufacture fire brick, tile and pottery, if the clay proves what is expected.

Experiments are being made at East Liverpool, O., with sample kaolin brought from near Monterey, Mexico, by a gentleman who has for the past five years been representing East Liverpool and Cincinnati potteries in that country. These samples were secured among the mountains, some five miles out of Monterey, and the deposits can easily be worked to advantage providing the tests result satisfactorily. In such event it is the intention of a wealthy East Liverpool manufacturer to establish a pottery at Monterey.

The writer has no knowledge of the extent of the efforts of United States pottery manufacturers to reach the trade of Mexico, but with the intense rivalry in the home trade it would appear a promising business venture to look into the possibilities in that country. Early this month, at Cincinnati, an interesting conversation was enjoyed with a gentleman just from that country, who had been selling pottery and glass goods throughout Mexico for several years. Speaking of trade conditions, prices, and his wares and their demand, he stated that a very ordinary article of meat platter, which it cost the manufacturer probably 15 cents to produce, was sold by him in the City of Mexico for \$3.85, and the price considered reasonable. While that figure, in United States coin, would be cut in half, the profit would still remain a handsome one, while the same rule should apply to other goods. This statement, while seemingly unlikely, may be true, yet is not vouched for. As suggested above, the country and its trade possibilities are promising subjects for investigation.

C. O. L.

The PROGRESS BRICK PRESS.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE
ON APPLICATION.

Progress Press Brick and Machine Co.,
King's Highway and Oak Hill R. R. **ST. LOUIS, MO.**

THE CUMMER DRYERS, For Drying Brick and Clay.



Using the mingled products of the fire and air or hot-air alone.
Both systems equally economical.

No Boilers. No Pipes. No Complications.

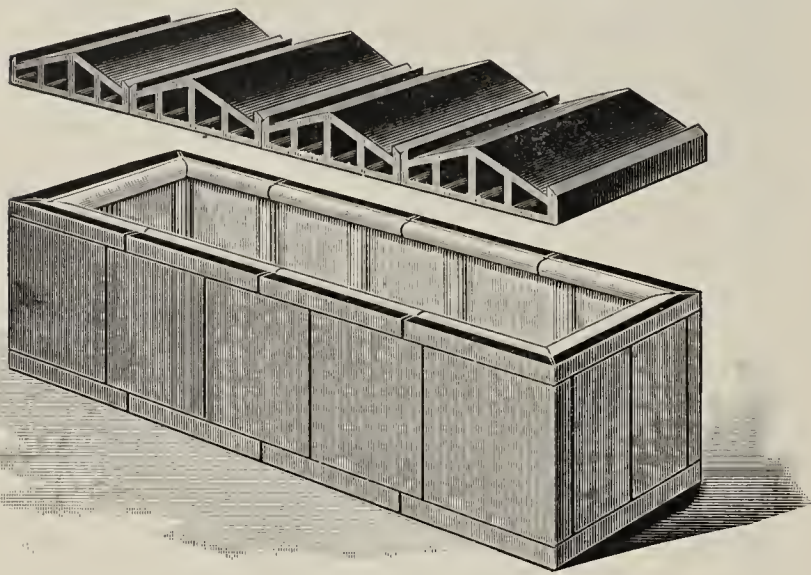
Great Capacity. Extreme Economy.

If we knew your Address, we would Send you a Catalogue.

The F. D. Cummer & Son Co.,
CLEVELAND, OHIO.

A NEW CLAY PRODUCT.

THERE IS "no new thing under the sun," maybe, but Mr. Frank Kaufman, a well-known tilemaker of Rosedale, O., has invented and is introducing another clay product that is worthy of consideration. Notwithstanding the fact that the Chaldeans or some other of the ancients may have crudely used clay for a similar purpose some thousands of years ago, Mr. Kaufman is none the less entitled to credit for perfecting



VAULT No. 2.

an ideal burial vault of burned clay, so designed that tile and brick manufacturers may easily add it to their list of products. Mr. Kaufman has favored us with a descriptive circular, from which we take the accompanying illustrations.

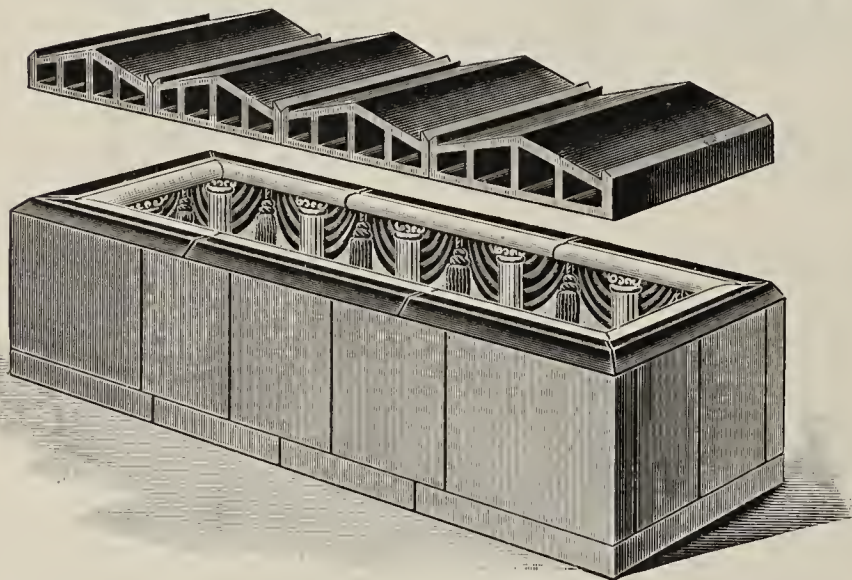
—Kaufman's Burial Vault, Patented Feb. 16, 1897.—

There has long been needed a burial vault which will exclude water, be impervious to burrowing animals, and indestructive, and at the same time add cheapness of construction to neatness of appearance. All this is accomplished by these vaults.

This vault is made of hollow sections of burnt clay; each section can be molded through a die and cut off in proper lengths, similar to drain tile.

The interior of all vaults is whitened with a special preparation and the exterior colored black.

This vault is similar in construction to No. 2, with the ex-



VAULT No. 3.

ception of a broader cap piece to extend over to catch a row of ornamental columns. In addition, the interior is artistically draped.

Desiring to have the Kaufman vault in use as early in the season as possible, I have concluded to dispose of the patent

as a whole, by State rights or by royalty plan. Correspondence solicited immediately, as I have already had numerous offers to take it.

As patentee and owner of this device, I am not in a position to manufacture the vault extensively, owing to other business and location. The fact that the vault can be manufactured in a number of grades, and each section can be molded through a die—the cheapest way to manufacture—is in itself a guarantee that there is big money in it. Canadian territory will also be disposed of.

Correspondence solicited. For further information, write for descriptive circular. FRANK KAUFMAN, Rosedale, O.

AKRON'S CLAY INDUSTRIES.

On the night of Oct. 20 last the large and finely equipped plant of Whitmore, Robinson & Co., of Akron, O., manufacturers of Rockingham and yellow stoneware, was destroyed by fire, throwing out of employment 150 men. The larger part of the immense plant is now rebuilt and running to its full capacity, employing one hundred men and turning out nine kilns of ware a week. It is the intention of the company to rebuild the remainder of the plant the coming summer, thus replacing the remainder of the employees whose work was so abruptly terminated by the fire. The demands on this company for their ware are steadily increasing to such an extent that the enlarging of their present capacity is imperative.

For some time past an earnest effort has been made among sewer pipe men to complete the organization of a great sewer pipe pool, or "selling agency," as it is called. The third week in March a meeting was called at Pittsburg for all manufacturers of sewer pipe east of Indiana. The meeting was attended by four or five of Akron's largest manufacturers of the product. After several days of preliminary work the meeting adjourned to meet in Cleveland last week, at which place it was thought the combine would be effected. The conflicting elements had been gotten together, and the "selling agency," under the name of the Central Union Sewer Pipe Company, had been incorporated. Before the committee who steered the organization knew what had happened a disruption followed, and the opposing interests were further apart and the lines of battle more sharply drawn than at any time since the pooling of interests had been talked of. The disruption, it is alleged, was caused by a dissatisfaction among some of the sewer pipe men about the per cent. of business they were to receive. If the object of the meeting had been accomplished, one of the most complete pools would have been formed, and would have included practically every manufacturer in America. It is hoped by those interested that the organization will yet be perfected.

The plant of the Akron Brick and Tile Company, manufacturers of the best qualities of building and paving brick, hollow building blocks, drain tile and sidewalk tile, is one of the most completely constructed plants in this section of Ohio. The company have recently started up, after a shut-down of six weeks for repairs and for increasing the capacity of their plant. They have placed in their works a new "Mammoth Ohio" brick machine, manufactured by E. M. Freese & Co., of Galion, O., with a capacity of 70,000 brick per day. The brick manufactured here are made of the famous Akron sewer pipe shale clay under the stiff mud process. There are three down-draft and three wind-guard up-draft kilns, with a capacity of 1,000,000 brick. The drying process used is the Bucyrus patent tunnel drier, which gives good satisfaction. Eight tunnels are in use at present, and another is being built, each capable of containing six cars. The plant is run by a 70-horse-power engine and two boilers of 60-horse-power each. The drain tile manufactured here is mostly shipped to the New England States and to Florida, to the latter State to be used for irrigating purposes only. Mr. John B. De Haven, the genial Secretary and General Manager of the company, informs the writer that he can run the plant every day for six months to its full capacity without receiving any more orders than they now have on hand. This looks like prosperity.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

We are Fishing for Business,



And we want some of yours. Our bait is Low PRICES, FINE MACHINERY and FAIR TREATMENT. If you like our bait take it, and give us a bite at your business. You will be so well satisfied that you will give us another bite when you have more business.

We sell everything used on a brickyard, and we give little orders for moulds or wires, just as careful attention as big orders for new machinery. If we cannot get big orders on our line we are ready to take little ones and look pleasant. We know they will bring big ones bye and bye.

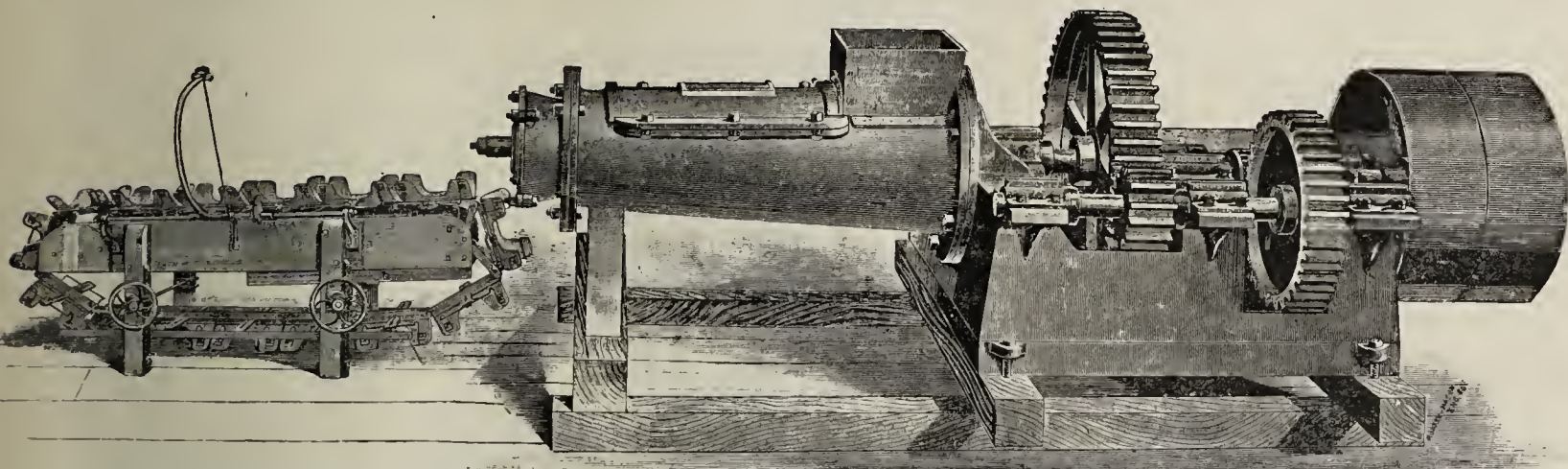
Perhaps you might do some fishing too. Bait your line with a trial order and see if you do not catch a Bargain.

The CHICAGO BRICK MACHINERY CO.,
225 Dearborn Street,

MADDEN & CO., Successors to NOLAN, MADDEN & CO.,

Manufacturers of

TILE and BRICK MACHINES.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequalled for large tile, 10 to 24 inch. These Machines are all sold on their merits and warranted to do first class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

MORE ACTIVITY IN THE TILE BUSINESS.

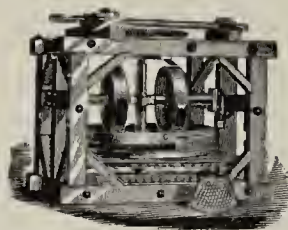
The very welcome change in the increased rainfall of the past few months has increased the demand for drain tile in many localities, and is likely to be further increased in the months to come. In level sections of the country the overabundant water supply has done much damage to growing crops. Those who have had the opportunity and foresight in the past to underdrain have had the satisfaction of seeing their level areas of land in cultivation relieved of the excess of water in a few hours. Every farmer of pride must feel to congratulate himself over the fact of his having made this wise provision in the improvement of his soil.

Tile manufacturers are alike well pleased to be recognized as common benefactors in supplying the needs of the country with drain pipe. During the dry seasons which have been experienced in the past three years they have been charged with having a hand in bringing the hardships incident to droughts upon the people. Some unwise people have gone so far as to say hard things about tilemakers. And these aspersions have been so common that tile manufacturers, in moving among men, have often felt that their credit was hardly at par with the mass of mankind. To-day, however, he is greeted on every hand with kind words and hopeful expressions, such as "We have to have more tile;" "I thought I was done draining, but the big rains have taught me better; I have lots to do yet;" "You may look for me in a few days to select some tile." These and kindred expressions make the outlook encouraging to tile manufacturers.

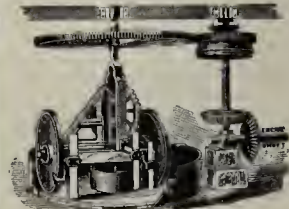
In every honorable calling in life men like to be appreciated, to have men speak well of them and what they are doing. Because a man is a mud mixer is no reason why any one should think he is destitute of manly pride in his calling. Men are to be judged by the result of their labors; what they are doing for the world in helping to develop its resources and in ministering to the well being and happiness of others as well as themselves. Judged by this standard, tilemakers have a just reason to be proud of the beneficial effects of the products which they turn from their hands. They have experienced discouragements in the past two or three years, but the future outlook is much more hopeful. "More rain, more tile;" more tile, more grass, more corn, more products of all kinds, more trade, more dollars. What we want is to put all idle hands to work; pay them in good money, and then they will buy more, eat more and wear more and better clothes. In this way increase the demand for more products. Say what we will, theorize as we may, when we come down to bed rock the one great

law governing the prices of our products is the law of supply and demand. We want to see the demand for tile increased, because it is needed to better the condition of the soil; it insures more and better products on the farm, with a greater certainty in agricultural pur-

suits. We are all interested in the upbuilding of the great manufacturing interests, to give employment to idle hands, that, with the products of the soil, idle mouths may be fed. Among these manufacturing interests the drain tile industry is not the least by any means.



Dry Pan.



Clay Mill—Harp Pattern.

THE TURNER,

VAUGHN & TAYLOR Co.

MANUFACTURES & EXPORTERS OF **CLAY WORKING MACHINERY.** CUYAHOGA FALLS, OHIO, U.S.A.

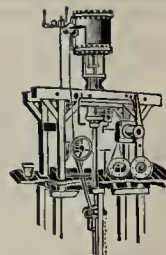
WIRE DRAWING MACHINERY. CHAIN MAKING MACHINERY. SHODDY AND RUBBER WASHING MACHINERY.

POWER TRANSMITTING MACHINERY.

PULLEYS & GEARING. CRANES HEAVY CASTINGS GRAIN CLEANING MACHINERY. ROPE TRANSMISSION HOLLOW TUBING MACHINERY. AND CONTRACTORS FOR COMPLETE PLANTS.



Flower Pot Machine.



Vaughn Press—Sewer Pipe.

**3 PATTERNS MOLD MACHINES,
2 SIZES OF DIE MACHINES,
PUG MILLS, RE-PRESSES,
STONE-EXTRACTING (CLAY) RUSHERS,
ELEVATORS, BARROWS, TRUCKS,
..... ENGINES AND BOILERS,
COMPLETE BRICK OR TILE OUTFITS**

ADDRESS:
H. BREWER & CO.
TECUMSEH MICH.

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,
Wellsburg, W. Va.

Results
Guaranteed.

Failure
Impossible.

Conveying, Elevating and... Power-Transmitting Machinery.

H. W. CALDWELL & SON CO.

Specialties for Handling
Material of
all Kinds.

GENERAL MACHINISTS,
127, 129, 131, 133 West Washington St.,
CHICAGO.

CALDWELL
Steel Conveyor.
Manufactured exclusively by us at Chicago, with latest
improvements



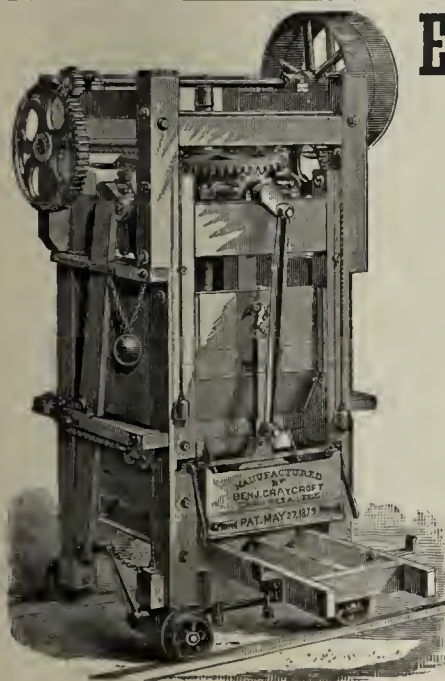
Send for Catalogue.



CALDWELL-AVERY SEAM-
LESS STEEL ELEV-
ATOR BUCKETS.

LINK BELTING.
SPROCKET WHEELS.
COTTON BELTING.
RUBBER BELTING.
LEATHER BELTING.
BELT CLAMPS.
ELEVATOR BOLTS.
ELEVATOR BUCKETS.
CONCRETE MIXERS.
FRICTION CLUTCHES.
JAW CLUTCHES.
COUPLINGS.
FLEXIBLE SPOUTS.

GEARING (all kinds.)
ELEVATOR BOOTS.
HANGERS.
PERFORATED METALS.
PILLOW BLOCKS.
IRON PULLEYS.
WOOD PULLEYS.
SHAFTING.
SET COLLARS.
SWIVEL SPOUTS.
TAKE-UP BOXES.
TURN HEAD SPOUTS.
WIRE CLOTH.



EAGLE BRICK MACHINE.

Steam and Horsepower.

THE BEST MACHINE IN THE MARKET.

The Horsepower Machine will make 17,000 to 20,000 brick per day; the Steam power Machine, 25,000 to 30,000.

These machines are sold on their merits, guaranteed to do first-class work.

Brick moulds for hand and machine a specialty. Send for Circular

BENJ. CRAYCROFT,

Manufacturer,

Vandalia, Ills.

C. J. CRAYCROFT, Fresno City, Cal., General
Agent for Pacific Coast.

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cent a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE—One No. 7 Penfield Brick and Tile Machine, as good as new. Will sell cheap on time. Address 137 N. Cass St. 41d Wabash, Ind.

WANTED—A responsible man to set brick and take charge of yard when owner is away. Address BEAUMENT, 41c Care Clay-Worker.

FOR SALE—2 tempering wheels, used one year; will sell for one-fourth original price; horse-power. Address W. A. BAILEY, 41cm Northampton, Mass.

WANTED—Position as superintendent in first-class yard; thoroughly understand soft and stiff mud and drain tile. No. 1 reference. Address "FORMER EMPLOYER," 41c Care Clay-Worker.

FOR SALE—A well-known brick manufacturer wishes to sell a quarter interest in a profitable, new buff brick factory in Pennsylvania. A practical man preferred. Part cash and good paper accepted. Address 41d R. S. W., care Clay-Worker.

WANTED—POSITION—Practical man, with \$10,000 in cash, wants partner with like amount to buy the best and cheapest vitrified brick plant in Kansas. Big money in it. Address R. B., 41lpm Care Clay-Worker.

FOR SALE, CHEAP—The W. C. Hill estate brickyard, Seattle, Wash. In good condition. Includes nineteen acres of land. One mile from postoffice. WILLIAM H. LEWIS, Administrator, 41cm Seattle, Wash.

WANTED—Situation as foreman or burner; 23 years' experience in the brick and tile business; well accustomed to the up and down-draft kiln; can give good reference from last place. Address 41c BOX 339, DeKalb, Ill.

FOR SALE—Huyett & Smith hot blast apparatus, with vertical engine, in A1 condition; cheap; suitable for brick or lumber drier, or for heating or ventilating purposes. BOX 479, 41e Care Clay-Worker.

FOR SALE OR RENT—Well-equipped brick and tile factory; good trade and location; best quality clay; gas for fuel; reasonable terms; former owner deceased. Address WHITE, 41cm Care Clay-Worker.

WANTED—Permanent situation as burner or foreman of brick works. Familiar with both up and down-draft kilns, and have burned both building and paving brick. Best of reference. Address 41d 492 CRESCENT, Care Clay-Worker.

WANTED—Situation as superintendent or burner by a man who is practical in every department of manufacturing dry pressed brick; also competent to erect entire plant for same. No. 1 references given. Address OHIO, 41cm Care of Clay-Worker.

FOR SALE—Plain slide valve horizontal engine, 40-horse-power, 9-foot fly wheel; 1 Crabtree hand repress; 9,000 soft mud foot pallets, 36 inches long; 1 Potts horizontal brick machine; 1 Potts No. 3 disintegrator; 1 Potts sander, and 1 Newall crusher, 26-inch. All in perfect condition. HAMBURG VITRIFIED BRICK CO., 41d Hamburg, Pa.

WANTED—\$15,000, either as a loan or to pay for one-fourth interest in a brick plant worth \$75,000. The works are well equipped. There is a large acreage of buff clays of highest grade. The entire product for the ensuing year has been sold. It is a paying plant, and the amount, whether a loan or an investment, will be perfectly secured. Address IROQUOIS, 41e Care Clay-Worker.

FOR SALE—Simpson Brick Press; good order. Address H.,
21 tf Care of Clay-Worker.

FOR SALE—Two complete overgeared 8-foot dry pans, with 48-inch pulley, entirely new. For particulars inquire of
SMITH & CAFFREY,
34 dm Syracuse, N. Y.

NO DRY PRESS Brick Plant complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Wellsburg, W. Va.

FOR SALE—Penfield upright stock brick machine, with independently geared pug mill. Made only 3,000,000 brick. Machine as good as new. Address C. F.,
32 d Care of Clay-Worker.

FOR SALE—A 30 years' old, well equipped Brick Plant, horse and steam power machines, Pallet system, gas or coal fuel. Reason for sale, failure of eyesight and old age. Write to
ANDREW STOLZ,
23 cm Meadville or Kerrtown, Pa.

SALESMAN—POSITION WANTED—As salesman of fire brick, sewer pipe or building and paving brick; have a thorough knowledge of the manufacture of these goods and requirements of the trade; could take office work or assist in management, as desired. Address SALESMAN,
31 d Care Clay-Worker.

FOR SALE OR EXCHANGE—Tile and brick plant, in one of the best cities in Iowa. Clay and reputation of wares O. K. Railroad switch to kilns, and best shipping point in this part of the country. Good reasons for wanting to move. Surrounding country rich and needs lots of tile.
41 d IOWA, care Clay-Worker.

FOR SALE—One second-hand plain slide valve steam engine, 12x24-inch cylinder, with pulley fly wheel 8 feet in diameter by 17-inch face. Engine complete, with governor and stop valve, and by maker of good reputation. We will put in order and place f. o. b. cars Philadelphia for \$300.
CHAMBERS BROS. CO.,
41 L Philadelphia, Pa.

WANTED—PARTY OR PARTIES—Fire clay for the manufacture of buff brick or sewer pipe, or all other products made from fire clay; 10-foot vein already opened; 10 miles from Pittsburg; products can be shipped by railroad or river; plenty of shale rock for red brick; 20-inch natural gas line through the property. Will furnish ground for the building of a plant, and also the clay, for an interest in the business. Address H. C. FOREMAN,
32 d Harmarville, Allegheny Co., Pa.

WANTED—Prices on pug mill (for pot-
ters), new or good second-hand.
8 or 9-foot (both) wet and dry pan, new or good second-hand.
50 brickyard cars and transfer cars, new or good second-hand.
One power repress, new or good second-hand.
One power dry press and dies, new or good second-hand.
We are open for deal on good second-hand sewer pipe machinery.
THE DIXIE TILE AND POTTERY CO.,
41 dm Oxford, Ala.

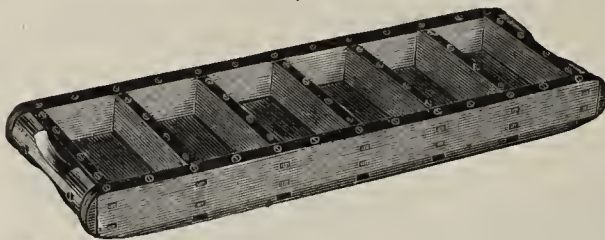
FOR SALE—The W. S. Williams Brick Plant, situated one mile from Canton, O., on the Valley Railroad. There are thirty-two (32) acres of land connected with this plant, underlaid with clay and shale for street paving brick, and for quantity, quality, variety and accessibility of clays cannot be duplicated, special attention being called to the buff clay deposits for the manufacture of straw-colored brick and other articles, which is unequaled. Capacity of plant, 25,000 street paving brick per day. This property will be sold cheap and on reasonable terms.
R. S. SHIELDS,
Assignee of Wm. S. Williams.
23 dm Canton, O.

FOR SALE—One 4-mold Boyd brick press, one 4-mold Eureka dry press brick machine, both in first-rate order; one straight line engine, 14x14, in excellent condition; one 8-foot Sturdivant blower; eight 7-foot drying fans; five second-hand horizontal boilers, 50 to 60 H. P., 5 and 6-foot diameters; one Raymond repress, small size, for hand work; 100 iron bedsteads; one No. 2 Worrell drier; one disintegrator, suitable for clay or tile manufacturers; 3,000 seggars, suitable for china or tile work. The above are in good order (excepting the boilers), and will be sold at a bargain. Address
C. SIEDLER, President,
23 dm 92 Liberty Street, New York.

HARDIN, BAILEY & CHURCH.

MANUFACTURERS OF

BRICK MOULDS



Of every kind and description. We make a specialty of Brick moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.

Don't fail to get our prices.

FREEMPORT, IND.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

F. H. C. MEY, Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

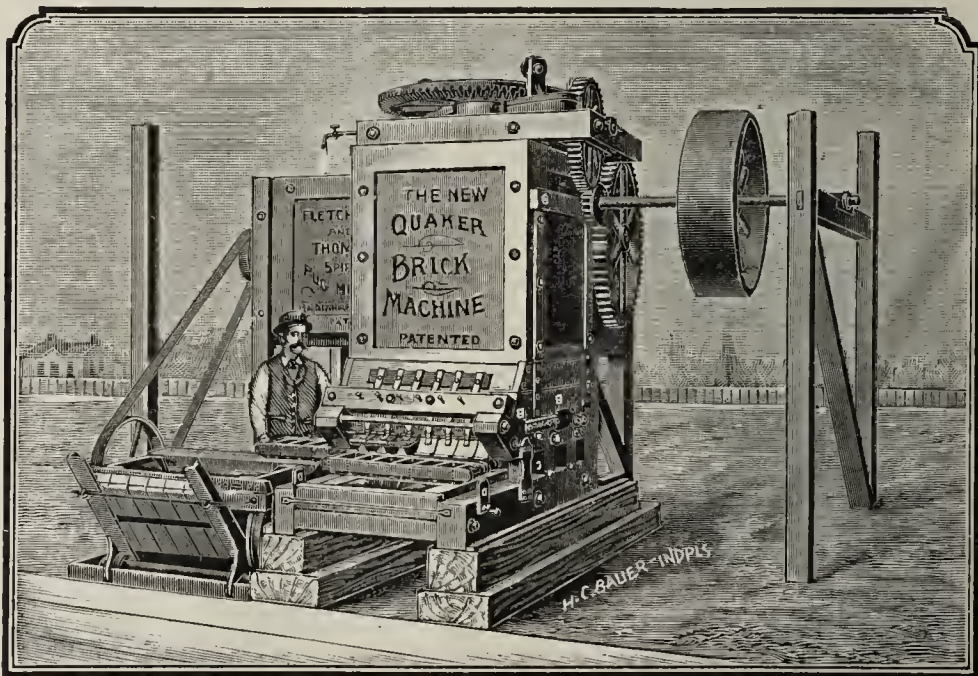
Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

Soft Mud Brick Machinery,

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sanding Machine, capacity 40,000 or more per day. We carry in stock a full line of first-class brickyard supplies at a very reasonable price. Send for Catalogue.



JAMES W. HENSLEY,

General Agent,

Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and....

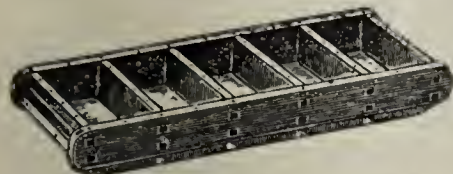
MACHINE

MOULDS

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

No. 829 Sixth St., Milwaukee, Wis.

A Special Discount on all orders received on or before March 1st.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

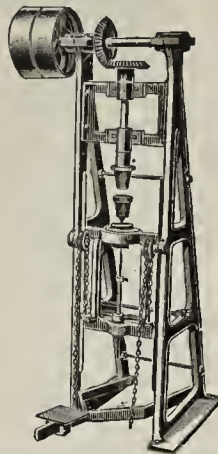
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

INDIANAPOLIS, IND.



CHAMPION Brick Mould

SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and serviceable.

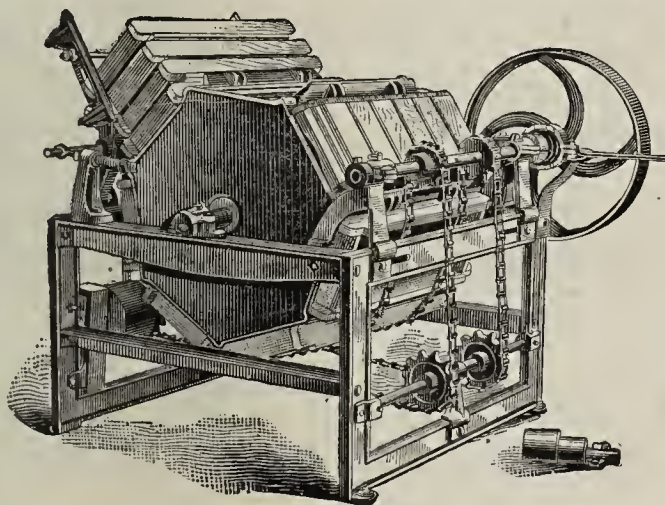
A. H. NEWTON,

Manager and Sole Agent,
HAVERSTRAW, N. Y.

THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, unless the Court grants a re-hearing of the case, or permission to go to the Supreme Court of the United States, a motion for which is pending and will be heard January 25th, 1897.

Only one patent No. 301,087 is involved in this decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 281,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit will be commenced at once on these patents against Buck and any persons purchasing from him or his agents.



4000 TO 5500

(Gallons of Water per hour.)

BY HAND-POWER.

Pumps, Hand-power Pumps.

(LOUD'S PATENT.)

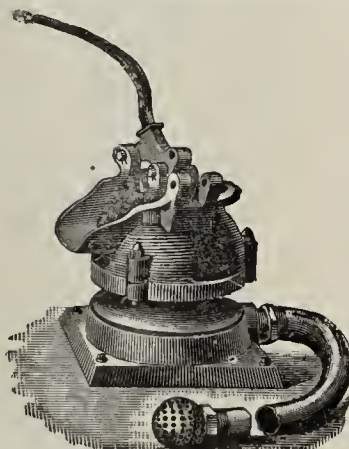
These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries or wherever it is desired to raise a large quantity of water by Hand-power. The pump has large valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade, including both dry press and auger machines, also continuous kilns using coal and producer gas, and different patterns of down-draft kilns. First-class references. Address

31 d SUPERINTENDENT,
Care Clay-Worker.

A BARGAIN.

FOR SALE—Brickyard, located at Jacksonville, Ill., one and one-half miles from square; capacity, 20,000 per day; city water; good house; 20 acres; enjoying more city trade than all yards combined; paying business; good reason for selling. Write 41 c J. S. TENDICK, Canton, Ill.

FOR SALE.

Large brickyard property, formerly occupied by the Merhof Brick Manufacturing Company, at Little Ferry, Bergen county, N. J.; 18 machines and all necessary improvements and fixtures to start manufacturing. Can be cut up into three large yards if necessary. Capacity, 30,000,000 brick per year. For further particulars inquire of SAMUEL TAYLOR, Hackensack, N. J., or M. E. CLARENDON, 78 Gold St., 3 tf L New York City, N. Y.

REAL BARGAINS IN NEW AND SECOND-HAND MACHINERY.

FOR SALE—A good soft mud brick machine, just as good as new, at the price of an old one; capacity 30,000 to 40,000 a day. Has worked successfully where others failed.

FOR SALE—A second-hand 60-horse-power slide valve engine, rebuilt, and a much better engine than many of the light ones now on the market; good for years of heavy work.

FOR SALE—A small but good tile machine, will make 3 to 8-inch tile or common brick, with 10-horse-power; just the thing for a small factory, and cheap.

FOR SALE—A good, though cheap, second-hand 40-horse-power piston valve engine, in excellent condition; suitable for small tile or brick plant.

4 T 3t MADDEN & CO.,
Rushville, Ind.

PAVING CONTRACT.

Sealed bids are hereby invited for the paving with vitrified brick and concrete foundation of the following streets:

Texas street, about.....23,725.34 yards
Common street, from Texas street to Milam street.....1,445.32 yards
Milam and Texas avenue intersection 963.1 yards
Texas avenue40,000 yards

Making a total of about.....66,000 yards

Said work to be done according to specifications on file in this office. Said bids to be in the hands of the Controller by 12 m. of Thursday, April 15, 1897. A certified check for \$1,000 to accompany each bid as a guarantee of good faith. The Council reserves the right to reject any and all bids. N. B. MURFF, Controller,
23 d City of Shreveport, La.

FOR SALE.

Parties having capital who desire to engage in the brick business are offered an exceptional opportunity by the undersigned. Location is noted for production of highest class paving brick. Eight good kilns, with capacity of over 40,000 each. Fine vein of best quality blue shale; 6 1-2-foot vein of good fire clay; also limestone and other minerals, and some timber. Transportation facilities first-class. Dwelling, office and barn. The property can be bought cheap, or would lease to right parties. Address

41 d CANTON STANDARD BRICK CO.,
Canton, O.

WANTED—Enameler wants position. Can enamel, "not slip and glaze," any bricks made of clay, superior to anything now produced. Will give positive proof of ability at own cost. Only reliable firms treated with. **CLARENDON,** 22 c
Care of Clay-Worker.

FOR SALE—Two Simpson presses, one Plymouth brick and tile machine, Plymouth board delivery, brick cutting table, Plymouth tile cutting table, Freese "A Special" brick machine, Stevenson pug mill and Emens granulator. For description of this machinery see page 579, June Clay-Worker, or address **CLEVELAND VITRIFIED PRESSED BRICK CO.,** 809 Cuyahoga Building, 7 tf d
Cleveland, O.

FOR SALE—4 second-hand boilers, 40 to 60-horse-power; 1 Chambers machine, 2 pug mills, 12 represses, 18 dump carts, 26 brick trucks, 28 brick wheelbarrows, 20 brick molds. Above goods are all second-hand, and will be sold cheap for cash. Inquire **CHICAGO HYDRAULIC-PRESS BRICK CO.,** Room 301 Chamber of Commerce Building, 15 c
Chicago.

FAST TIME AND THROUGH SERVICE TO SOUTH BEND.

Commencing June 22, through parlor cars will be operated between Indianapolis and South Bend daily, except Sunday, on Big Four train No. 3, leaving Indianapolis at 5 p. m., making immediate connection with Vandalia line fast train at Colfax, which passes through Frankfort, Logansport, Lake Maxinkuckee and Plymouth, arriving at South Bend at 10:45 p. m. **G. E. ROCKWELL, D. P. A.,** for details.

Paving and Pressed Brick Plant For Sale.

ONE-THIRD ACTUAL VALUE.

Located in the best of all Western cities. Fine brick buildings, Iron Clad Dryer, Chambers Bros. B. C. D. Brick Machine, Whittaker Dry Press, two Steel Boilers 100 horse power each, Atlas Engine 150 horse power, Pug Mills, two Dry Pans and everything in first-class condition. Reason for selling, have other business. Address "C. H." 31 d
Care Clay-Worker.

ALBANY SLIP CLAY.

We have a large bank of a superior quality of SLIP CLAY. Price very low by barrel or carload. Best of reference as to quality. Address

JOHN H. JACKSON,
Successor to JACKSON BROS.,
ALBANY, N. Y.

N Y State Drain Tile and Pipe Works.
Established 1852.

Manganese.

From Producer to Consumer.

For Brick, Tile, Terra Cotta
and Pottery Makers.

PULP, POWDERED OR GRAIN.

Samples and Prices on Request.

KENDALL & FLICK,
MINES AND WORKS IN VIRGINIA.

OFFICE:

618 Penna. Avenue N. W.,

WASHINGTON, D. C.

Booklet on the use of this material free.



Dean Bros. Steam Pump Works,

—* INDIANAPOLIS, IND. *—

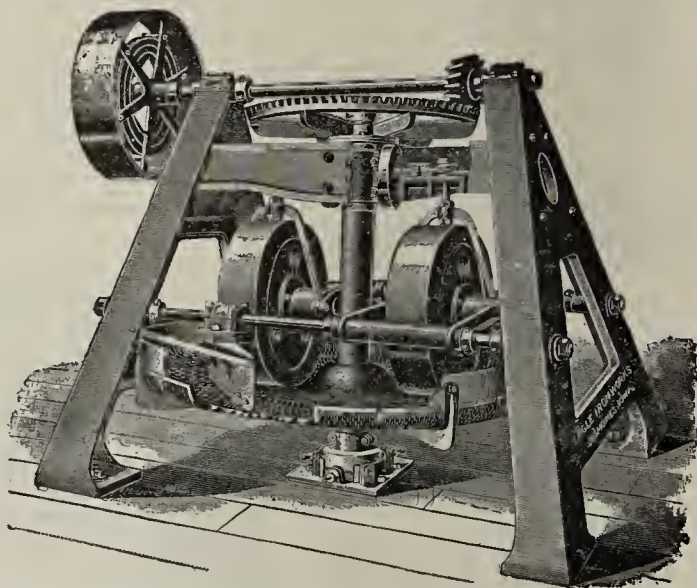
**SINGLE & DUPLEX PUMPS.
HORIZONTAL AND VERTICAL PUMPS.**
Best Design & Workmanship.
PRICES REDUCED Send for CATALOGUE.

OUR NEW 9 Ft. IRON FRAME DRY PAN

SEND for catalogue and read up on our patented features of this machine. Our motto in its construction and design is

"NOT HOW CHEAP.
BUT HOW GOOD."

EAGLE IRON WORKS, Des Moines, Ia.



BRICK MACHINES AND REPRESSSES.

....

THIS cut represents our Stiff Mud Brick Machine. It will work any kind of brick material including fire clay, shale or common clay right from bank without the use of a pug mill. Each brick is pressed separately and can be haked 7 or 8 high, or repressed right from machine.

Over 500 in operation.

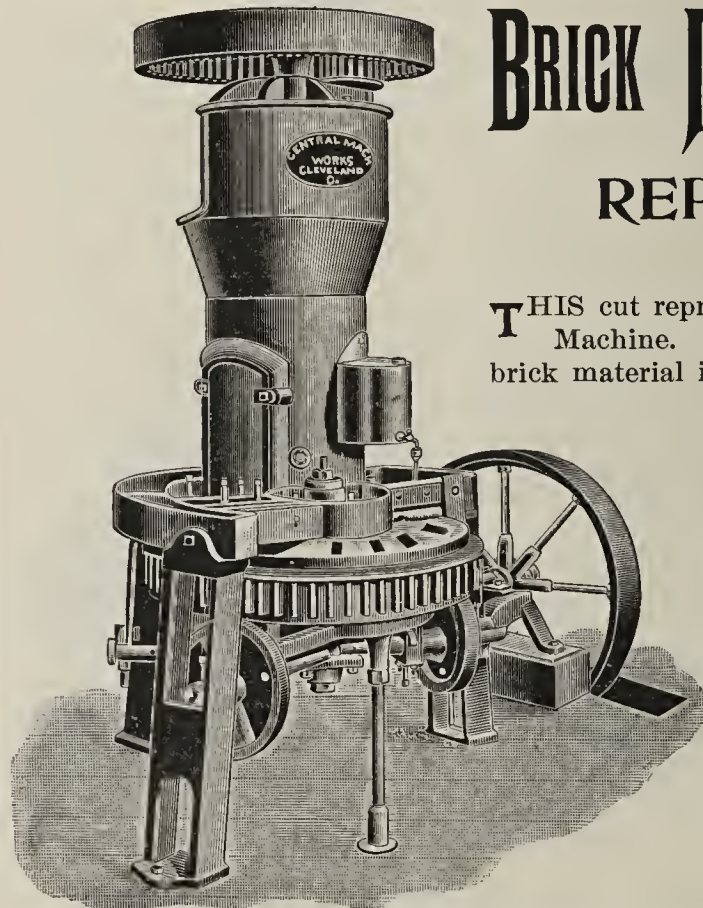
Send for price and circulars

Manufactured by

**CENTRAL
MACHINE
WORKS,**

226-236 Abbey St.

Cleveland, Ohio.



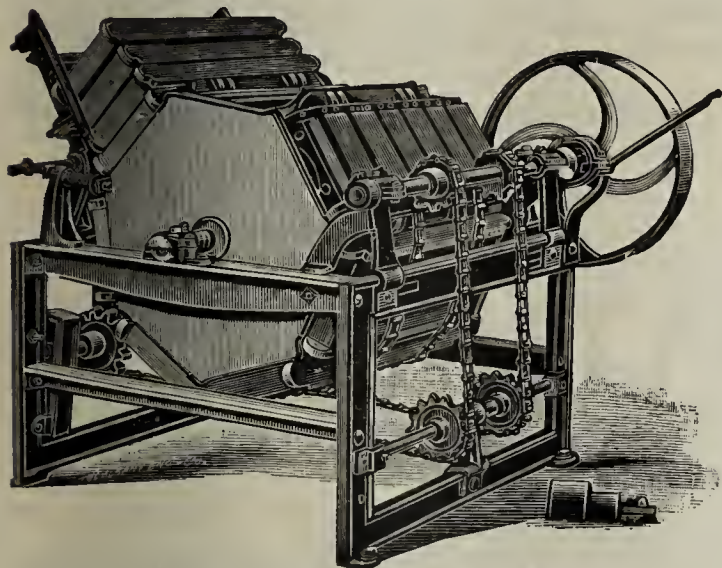
NOTICE—We furnish all supplies and repairs for any make of the "Sword" Brick Machine.

FIRE

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kilm Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

BUCK'S NEW CHAMPION Brick Mould Sanding Machine.



Judge Wallace's Decision.

[COPY.]

U. S. Circuit Court Southern District of New York.

ADDIE NEWTON } In
vs. } Equity.
WILLIAM W. RIDER }

This cause having come on to be heard this sixth day of April, 1895, upon argument of demurer, and Mr. Walter E. Ward having been heard on the part of the plaintiff, and Mr. George A. Mosher on the part of the defendant, and due deliberation having been had, it is. Ordered, adjudged and decreed that demurrer be sustained, and that the plaintiff's bill of complaint be dismissed with costs to the defendant to be taxed.

WM. J. WALLACE,
Circuit Judge.

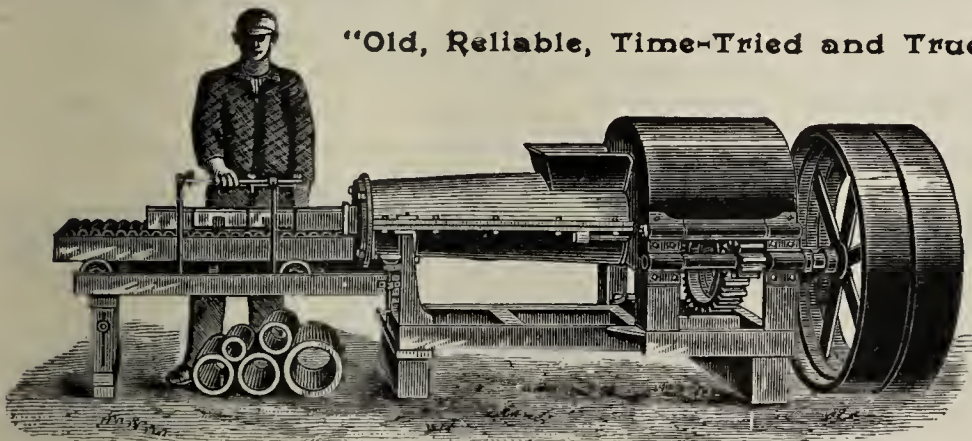
THIS terminates the suit on patent No. 301,087 which Newton has so extensively advertised. It was defended by J. A. Buck without expense to Rider. Any interest which Newton may have had in this patent has since been sold at receiver's sale, April 30, 1895. The other patents relating to this machine had been previously sold January 21, 1892, at a similar sale. J. A. Buck now owns or controls all patents relating to this machine, and the trade is warned that so-called "Champion" machines made by other parties are infringements upon these patents.

J. A. BUCK, 76 Oneida St., Cohoes, N. Y.

WHITEHEAD BROS. & CO., General Agents, 517 West 15th St., New York City.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON, PARKHILL, ONTARIO,

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the NEW QUAKER BRICK MACHINE.

THE IMPROVED Interlocking Brick, For Hollow Walls and Ventilating.

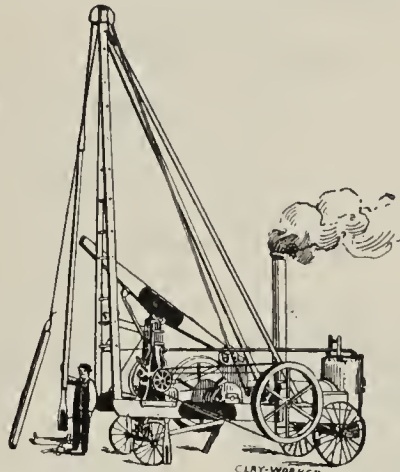
Send for pamphlet.

G. S. BALSLEY, 490 Howard Street, Detroit, Mich.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,
PERTH AMBOY, N. J.

Steubenville Foundry & Machine Works,

Established in 1820.

—Manufacturers of—

STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,

Making From 2 to 30-Inch
Pipe Inclusive.

Pipe, Brick, Tile, Coping,
Fire Proofing, and
Building Block Dies.

Clay Grinding and Tempering
Pans and Pug Mills.

FEED
SCREWS

FOR
MINING
CLAY.



STEAM
— ENGINES

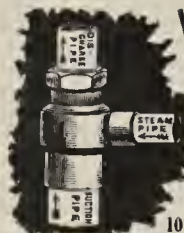


—AND—

Every Variety of Iron and Brass Castings
Shafting and Pulleys.

Send for Circulars and Estimates.

JAS. MEANS & CO.,
Steubenville, Ohio.



VANDUZEN STEAM PUMP
THE BEST IN THE WORLD.
 Pumps Any Kind of Liquid.
 Always in Order, never Clogs nor
 freezes. Every Pump Guaranteed.
10 SIZES.
 200 to 12000 Gallons per Hour.
 Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
 102 to 108 E. Second St., Cincinnati, O.

A. F. TENNILLE'S

Bureau of

News and Legislative Information,

Congressional, Financial and Commercial.
 Tariff, Silver Question and Copyrights a special-
 ily. Information and Correspondence fur-
 nished in all languages.

BLISS BUILDING, Room 22,
 35, 37 and 39 B St. N. W., WASHINGTON, D. C.



Solid Train Between
Sandusky and Peoria
 —AND—
 INDIANAPOLIS and
 MICHIGAN CITY,
 FT. WAYNE and
 CONNERSVILLE.

Through tickets sold to all points in the United
 States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger..... 7:00 a. m.
 *No. 22 Passenger..... 1:20 p. m.
 No. 24 Passenger..... 7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger..... 10:20 a. m.
 No. 23 Passenger..... 2:50 p. m.
 No. 25 Passenger..... 6:20 p. m.
 *Daily.

Union Depot connections at BLOOMINGTON
 and PEORIA for points, WEST, SOUTHWEST and
 NORTHWEST.

Direct connections made at LIMA, FOSTORIA,
 FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains
 on Main Line and I. & M. C. Div., for all points
 NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call
 on
 A. H. SELLARS, Agent,
 Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.
 INDIANAPOLIS, IND.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KAN-
 SAS CITY. The only line running Reclining
 Chair Cars between INDIANAPOLIS, and DE-
 CATUR, SPRINGFIELD and JACKSONVILLE,
 ILLINOIS.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.
 Mail and Express..... 8.30 a m
 Accommodation..... 3.25 p m
 Fast Express..... 11.20 p m

ARRIVE.
 Fast Express..... 3.30 a m
 Accommodation..... 10.40 a m
 Mail and Express..... 4.50 p m

JNO. S. LAZARUS, Gen. Pass. Agent.

LUMBER AND BRICK DRYERS, MOST EXTENSIVE IN USE. W. A. LEARY,

1103 H Street, N. W.

WASHINGTON, D. C.

Do You Want

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and com-
 panies? What are the latest BRICK-making inventions? and a dozen other things that every
 BRICKman ought to know, and the knowing of which means more business and better busi-
 ness? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, **ASSOCIATED TRADE & INDUSTRIAL PRESS,**
 ESTABLISHED NINE YEARS. Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

"LEVIATHAN."

"Upon Earth There is not His Like."

MAIN BELTING CO., 248 Randolph St., Chicago, Ill. Sept1896.
 GENTLEMEN:—Please ship us via freight, 146 feet x 18" 8 ply "Leviathan" Belting. Therea-
 son you have not heard from us of late is, we have been trying the "just as good for less money
 belting. You can count on our future orders for "LEVIATHAN."
 Prompt shipment of the above will oblige. Yours very truly,

Manufactured under Special Process.
A Guarantee of Superiority.

NOTE —By our special process of treating the material used in the manufacture of this
 belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum

MAIN BELTING COMPANY,
 Sole Manufacturers LEVIATHAN BELTING,
 248 Randolph St., CHICAGO, ILL.

PHILADELPHIA: 1219 Carpenter Street.

BOSTON: 120 Pearl Street.

Elevators

For handling
 CLAY,
 COAL,
 SAND,
 BRICK,
 TILE,
 PACKAGES.

Also Furnish
 RUBBER,
 LEATHER,
 COTTON
 BELTING.

JEFFREY
 Roller, Steel and Special CHAINS
 FOR
**ELEVATING
 CONVEYING
 MACHINERY**
 FOR HANDLING MATERIAL OF ALL KINDS.
 Power Transmission Machinery.
 COAL MINING MACHINERY.
 WIRE CABLE
 CONVEYORS.
 For long and
 short distance
 conveying.
THE JEFFREY MFG. CO., Columbus, Ohio.
 Send for Catalogue. 163 Washington St., NEW YORK.

Conveyors.

Manufacture
 SHAFTING,
 PULLEYS,
 HANGERS,
 GEARS,
 CLUTCHES,
 BUCKETS,
 BOOTS,
 BOLTS,
 Etc. . . .

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

....

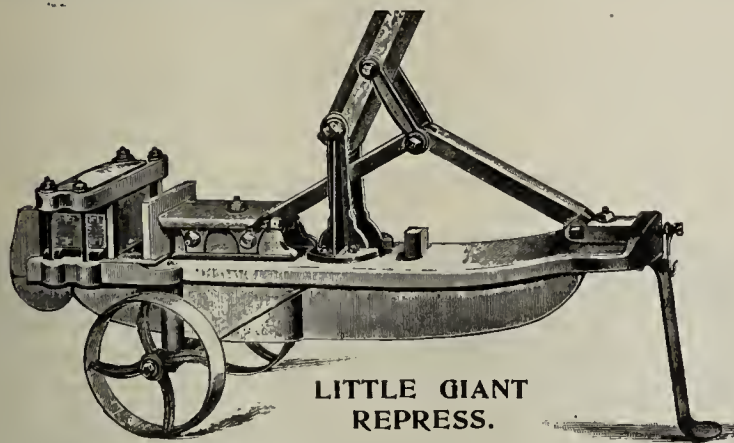
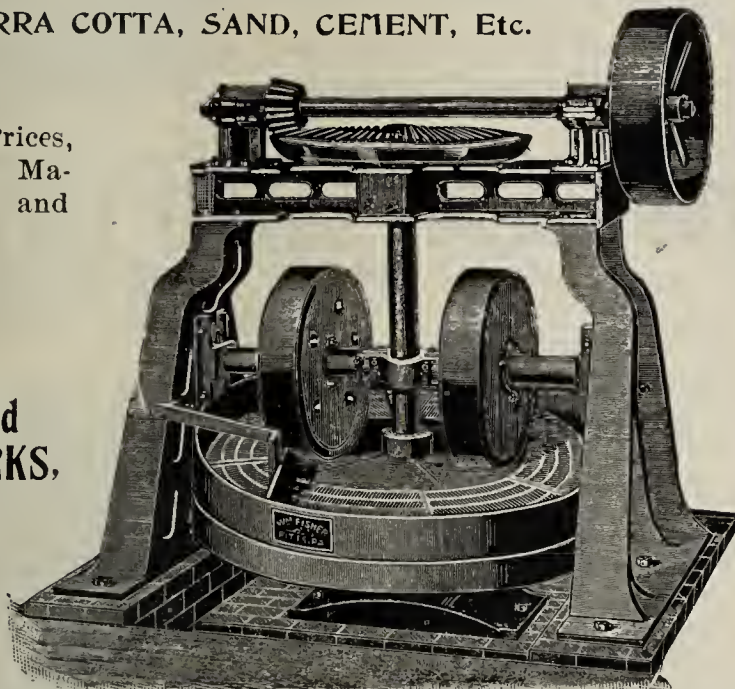
When writing for Prices, state kind of Clay or Material to be ground and capacity required.

....

**FISHER ENGINE
FOUNDRY and
MACHINE WORKS.**

Phillips & McLaren,
Proprietors,

24th and Smallman Sts.,
PITTSBURG, PA.



LITTLE GIANT
REPRESS.

ELI Auger Machine,
Capacity 45,000 to
70,000.

ELI Jr. Auger Ma-
chine, Capacity 30,-
000 to 40,000.

LITTLE ELI Auger
Machine, Capacity
15,000 to 20,000.

No. 1 A, Auger Ma-
chine, Capacity 25,-
000 to 35,000.

No. 2 B, Auger Ma-
chine, Capacity 12,-
000 to 20,000.

THE No. 1 A and No. 2 B Machines furnished with Square Hopper in place of Upright Pug Mill if desired.

DISINTEGRATORS, HORIZONTAL CONVEYORS,

GRANULATORS—SINGLE AND DOUBLE SHAFT,

UP-RIGHT PUG-MILLS, WINDING DRUMS,

BRICK TILE AND HOLLOW BLOCK TABLES.

TRUCKS, WHEELBARROWS, ETC.

Manufactured and fully warranted by

Michigan Brick and Tile Machine Co.,
MORENCI, MICH.

Electricity

Mechanics; Mechanical and Architectural Drawing; Plumbing; Architecture; Mining; Civil Engineering in all Branches; Steam Engineering (Stat'y, Loco. and Marine).

The International Correspondence Schools



To Electrical Workers,

Machinists, Miners, Plumbers, Civil Engineers, Draughtsmen, Carpenters, Steam Engineers, Steam Fitters. References, Free Apparatus. Send for Circular, Stating Subject you wish to Study.

Box 958 Scranton, Pa.

GEO. S. COX'S

**Ready Made
Cutting Wires,**

Always give Satisfaction.

EAST LIVERPOOL, OHIO.

Send for Samples and Prices.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN,
H. W. FULLER, Ass't Gen'l Pass. Agent.
Gen'l Pass. Agent, CINCINNATI, OHIO
WASHINGTON, D. C.

M. V. B. WAGONER'S

SLIP CLAY { For Glazing of Pottery } WORKS

ESTABLISHED 1845.

Clay in stock in any quantity, in barrels and bulk by the carload.

Office, 20 Ten Broeck St., ALBANY, N. Y.

STOP-LOOK LISTEN

THE
POPULAR

MONON ROUTE
LOUISVILLE NEW ALBANY & CHICAGO RY CO.

IS THE BEST LINE TO

CHICAGO

TIME
REDUCED TO 4 3/4 HOURS.
FOUR DAILY TRAINS

Leave Indianapolis	{ 7:00 a. m., 11:50 a. m. 3:35 p. m., 12:55 night
Arrive Chicago	{ 12:00 noon, 6:00 p. m. 8:20 p. m., 7:20 a. m.
Trains	{ 3:30 a. m., 7:45 a. m.
Arrive Indianapolis	{ 2:35 p. m., 4:37 p. m.

LATEST IMPROVED

VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant

PARLOR CARS AND DINERS

Local Sleeper in Indianapolis Ready at 8:30 p. m.
Leave Chicago, Returning, at 2:45 a. m.
Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.

VANDALIA LINE

The Short Line for

ST. LOUIS AND THE WEST.

LEAVE	AT. TERRE	AR. ST.
INDIANAPOLIS,	HAUTE	LOUIS.
* 7:20 am	10:05 am	
* 8:15 am	10:19 am	3:55 pm
* 12:40 noon	2:44 pm	7:32 pm
* 7:00 pm	9:04 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am

*Daily.

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Tickets Offices, 48 West Washington St., 46 Jackson Place and Union Station.

GEO. E. ROCKWELL, Dis. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS

MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns **WANTING INDUSTRIES**

This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner 1. C. R. R. Co., 506 Central Station, Chicago.

TAKE THE
BIG 4
TO
ST. LOUIS

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 1891.

More Than 1,000 Now Stand as

Monuments of Fame to its Inventor

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and now burning almost everything made from clay, such as Sewer Pipe, Vitriified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what they say of it, address,

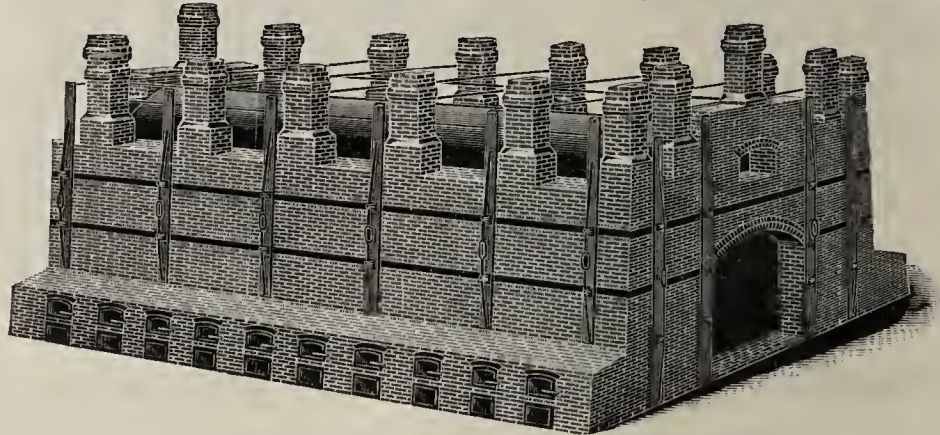
E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
Marietta, Pa.

Chenoa, Ill.



THE THAI SON LATEST IMPROVED COMMON SENSE UP-DRAFT KILN.



Do you make brick? And have you any trouble in burning them? If so, do you want a cheap constructed, simple and durable Kiln? One that will dry any brick without the assistance of Dryer or Fans, and in one-half the time. A Kiln where heat and draft can be changed to any part at will, and burn all hard brick, even and alike throughout, in less time, and with less fuel than any other, no up or down draft Kiln of any kind excepted. This is the Ideal Kiln for Dry Pressed Brick and the best on earth. Sure success with this Kiln. Call and see it at my works or for further information address,

Brick Manufacturer.

A. THAI SON, Laredo, Texas.

THE
HOT BLAST APPARATUS

FOR DRYING
BRICK
TILE AND
TERRA COTTA

American Blower Co
SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

THE
HOT BLAST APPARATUS

FOR DRYING
BRICK
TILE AND
TERRA COTTA

SEND FOR CATALOGUE

THE Best Up-to-Date Brick Dryer.

The PHILLIPS DRYER is THE BEST DRYER because it dries brick Quickly, Safely and Cheaply. By this system there is really no cost for fuel for it saves more fuel than it uses. This may sound queer but it's A PROVEN FACT.

SOMERSET, MASS., August 26, 1896.

S. G. Phillips, Esq., Rahway, N. J.

DEAR SIR—Replying to your inquiry regarding Dryer. We are pleased to say the dryer has now been running five weeks, and so far has given the best of satisfaction, drying our pressed brick for enameling in 10 hours, size of brick (9" x 4 1/2" x 3") without warping or checking.

A vacuum gauge to the exhaust, that heats the dryer, shows our variable cut-off engine to be made condensing, and it is safe and not over-estimated in any point of view to say, the dryer is so far working all right, and costing us no extra power, or firing, as we also do our former work and yet are saving 20 per cent. in our fuel.

We consider the dryer to be doing all if not more than promised, and hope soon to add to our present capacity another two track section.

Yours truly,
SOMERSET & JOHNSONBURG MFG. CO.,
By Warren H. Sandford, Treas.

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,
CHAMBERS BROTHERS Co.,
J. H. Chambers, Gen'l Mgr.

S. G. PHILLIPS.

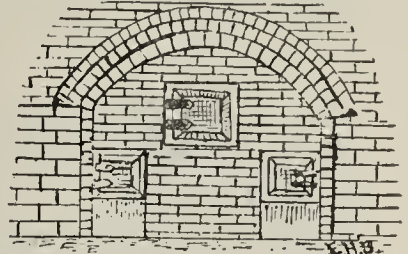
Agent and Patentee,

161 Grand Street.

— Rahway, N. J.

Swift's Kiln Furnace,

CAN BE ATTACHED to any kind or style of Up or Down-Draft kiln. Nothing but slack or waste coal used from start to finish of burn. Fires not disturbed but once in 10 hours till watersmoke is off. Guaranteed to

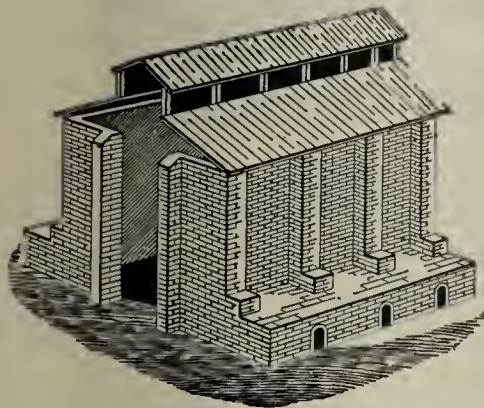


F. E. SWIFT'S PATENT SLACK COAL COKER, GAS GENERATOR AND SMOKE CONSUMER.

watersmoke dry press brick or the tenderest of clays or ware of any kind without damage. These furnaces can be seen in operation at my works at all seasons burning drain tile in winter and brick in Summer. It will pay you to investigate—I can save you good money.

For further particulars, address

F. E. SWIFT,
Washington, Iowa.



Up-Draft Kiln.

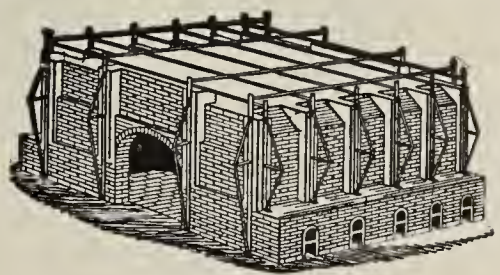
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET. The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiln.

ALSIP'S

LATEST IMPROVED
DOWN and
UP-DRAFT KILN.

IS SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

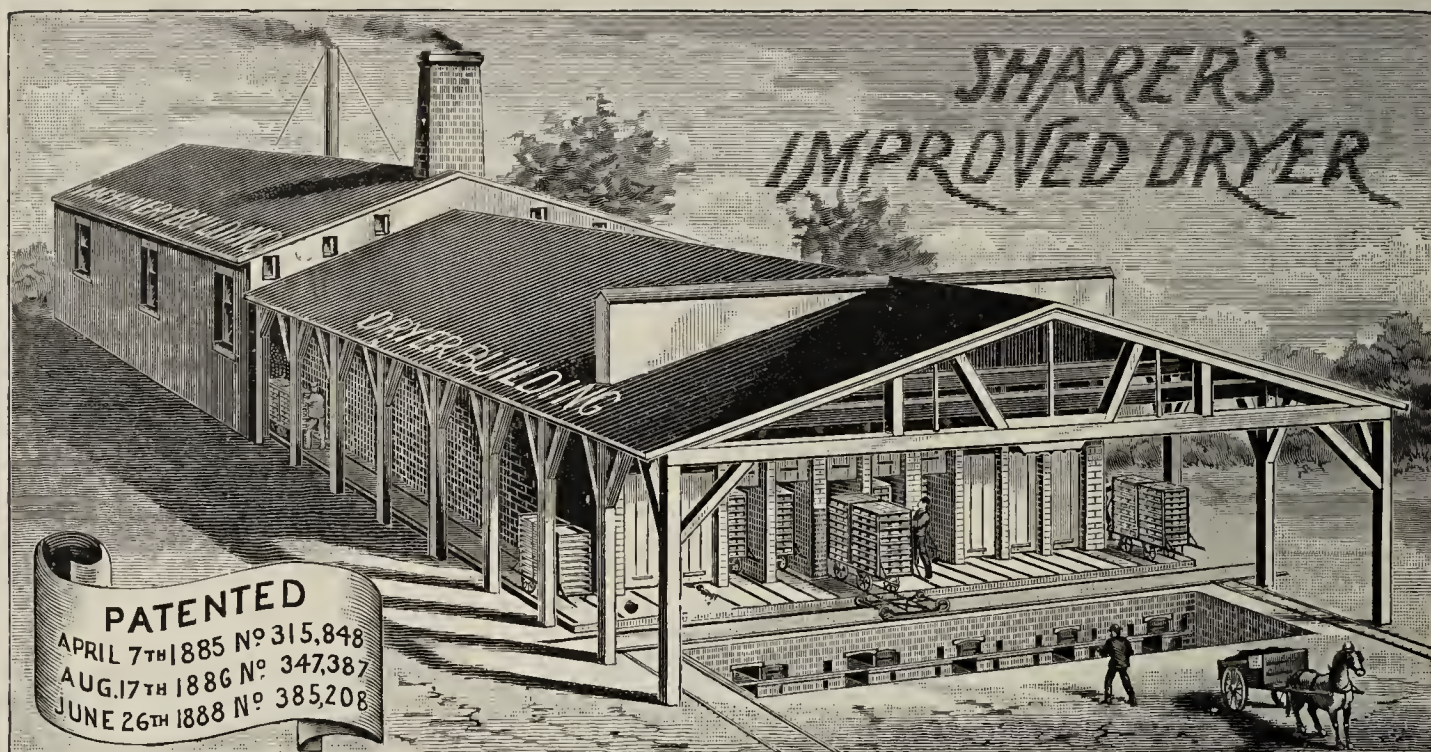
Address, S. H. ALSIP,

Days Brick Yard.

— BELLEVILLE, ILL.

Geo. W. Sharer,

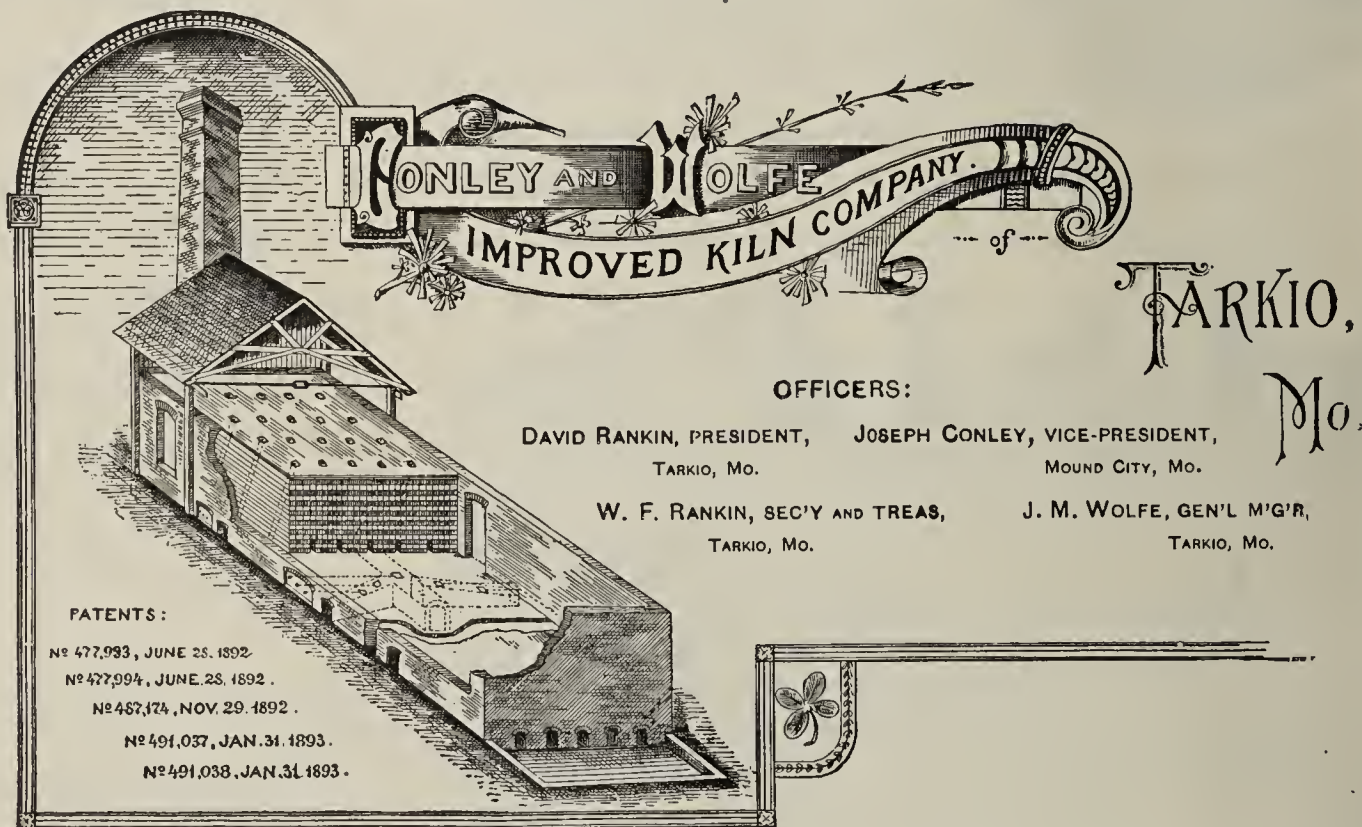
Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.



PATENTED
APRIL 7TH 1885 N° 315,848
AUG. 17TH 1886 N° 347,387
JUNE 26TH 1888 N° 385,208

COMPLETE Dryer and Kiln outfits, and Complete
Plants a specialty. Address

GEO. W. SHARER, 2224
Tioga, St. Philadelphia, Pa.



PATENTS:

N° 477,993, JUNE 28, 1892.

N° 477,994, JUNE 28, 1892.

N° 487,174, NOV. 29, 1892.

N° 491,037, JAN. 31, 1893.

N° 491,038, JAN. 31, 1893.

OFFICERS:

DAVID RANKIN, PRESIDENT,
TARKIO, Mo.

JOSEPH CONLEY, VICE-PRESIDENT,
MOUND CITY, Mo.

W. F. RANKIN, SEC'Y AND TREAS,
TARKIO, Mo.

J. M. WOLFE, GEN'L M'GR,
TARKIO, Mo.

THIS KILN is cheap to construct, simple in operation and permanent in character. It has no crown to fall in and costs nothing for repairs. The dampers in the bottom give complete control of the heat and draft. It burns all brick evenly and thoroughly. It heats the brick gradually and cools the same, producing a tough and thoroughly annealed brick. It requires less than 200 lbs. slack coal per thousand to burn the very best annealed vitrified shale paving brick. It saves labor—one man can fire the largest kiln.

The Slack is converted into Gas and all the Heat Energy in the Coal is Utilized.

IT IS A SMOKE CONSUMER
AND A PROFIT PRODUCER.



YOU NEED THIS KILN.



WRITE OUR GENERAL MANAGER
FOR FULL INFORMATION.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

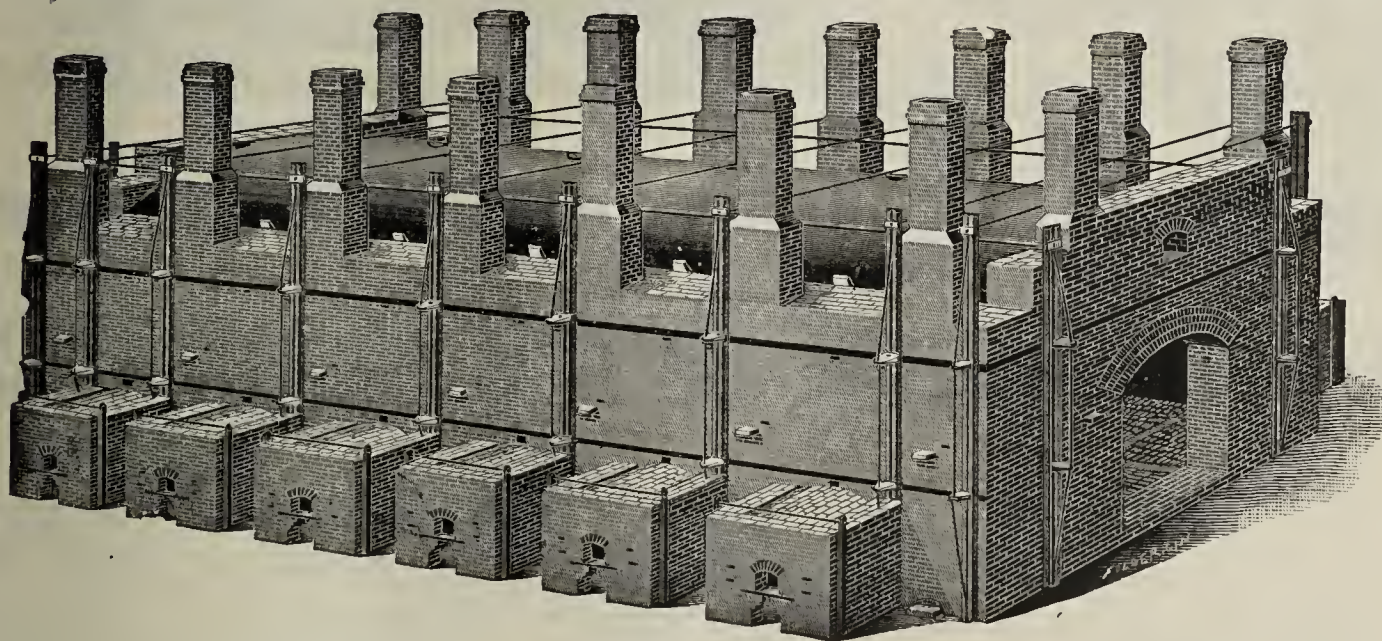
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.

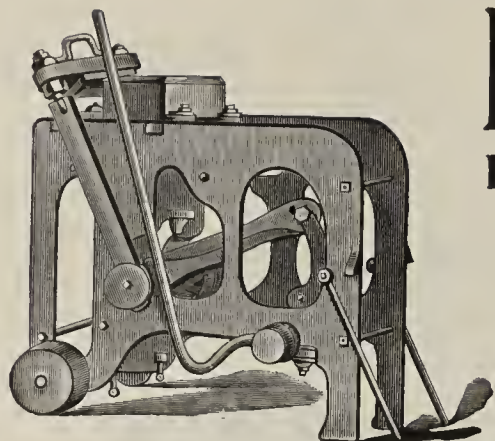


A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

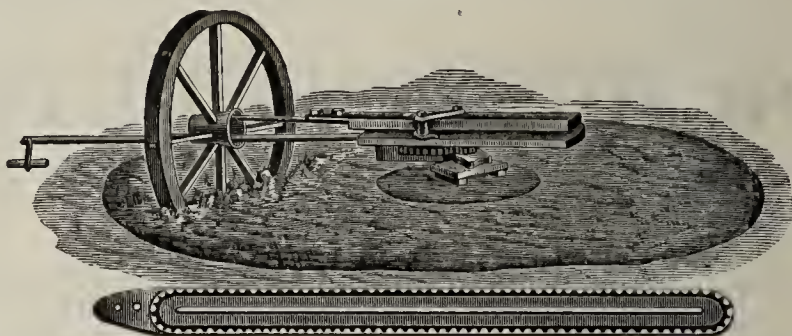
Send for Circular and Price-List.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.



BRICK CARS.

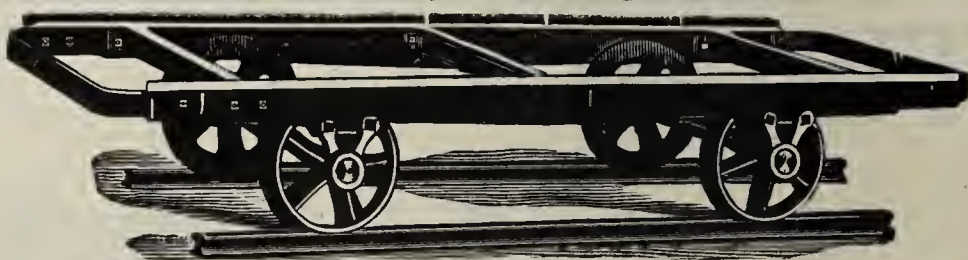
THE BEST. NO EXPERIMENT.

Thirty styles of our cars in use in all parts of the United States and Canada. Nearly 2000 of our cars are in use in Cleveland alone by the following Brickmakers:

F. H. Eggers,
C. G. Barkwell,
Standard Brick Co.,
Peter Cullen,
Collinwood Brick Co.,
Cleveland Brick Co.,
Canadian Copper Co.,
George Gynn,
Warren Farr,
John Cullen.

Write Them,
Then Us.

Catalogue and Price List sent on application.



Style 28.

WALWORTH RUN FOUNDRY CO., Cleveland, O.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,*Grassy Point, Rockland Co., N. Y.*

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

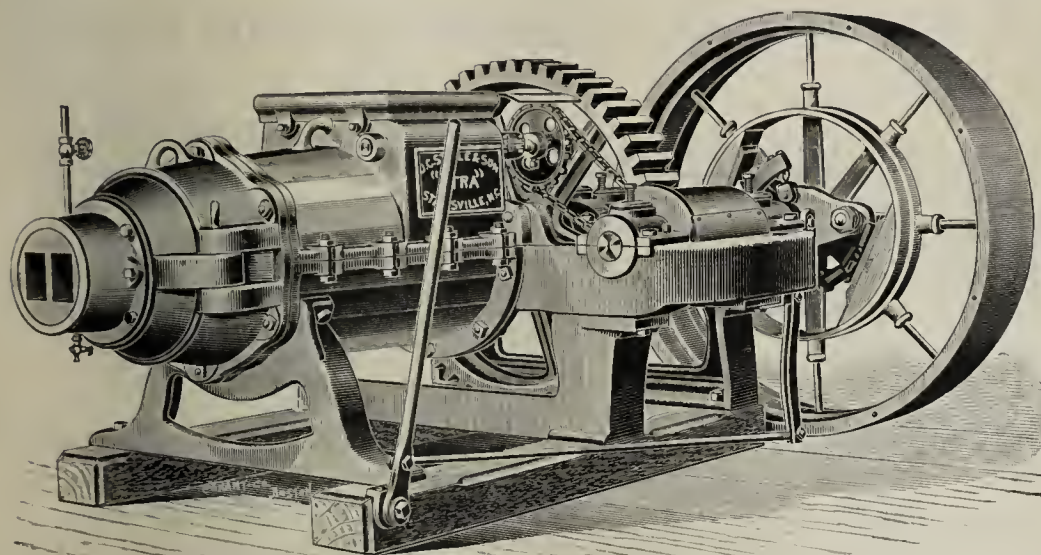
Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

The New South Brick Machinery



X-tra Machine. Capacity 25,000.

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.

DANVILLE, VA., Sept. 22, 1896.

J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Answering your query as to how we are pleased with the outfit furnished us by you of brickmaking machinery and implements, we would say that it has given us good satisfaction. The brick machine does all that you claimed for it. The trucks are great labor saving implements and the winding drum and cars equally so. In our system we could hardly dispense with either the trucks or cars and drums.

Respectfully,

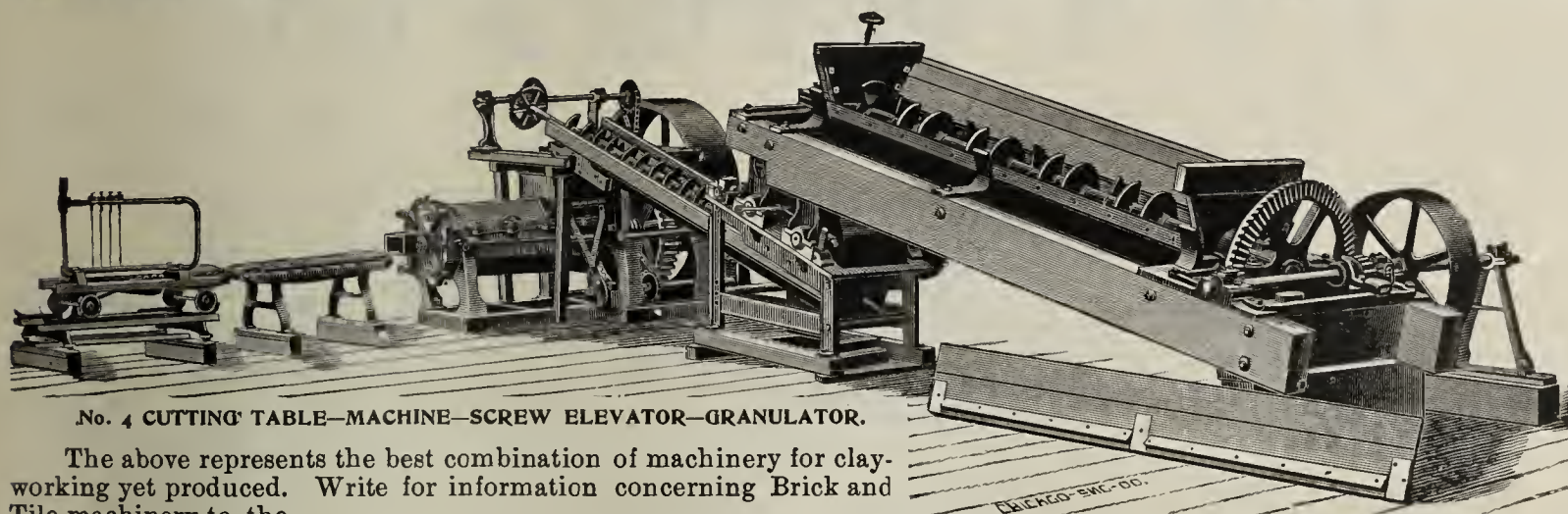
DON VALLEY BRICK CO.

(This company is using the "X-tra" machine and make 30,000 brick per day.

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

ADRIAN BRICK AND TILE MACHINE CO.



No. 4 CUTTING TABLE—MACHINE—SCREW ELEVATOR—GRANULATOR.

The above represents the best combination of machinery for clay-working yet produced. Write for information concerning Brick and Tile machinery to the

ADRIAN BRICK AND TILE MACHINE CO., Adrian, Michigan.

STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

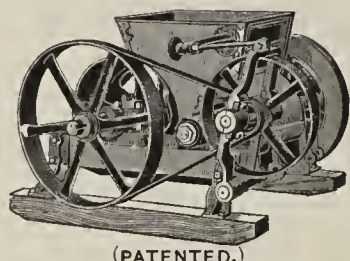
Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

Aurora, Ind.

Are Worthless Goods Copied? Or Unpopular Goods Imitated?



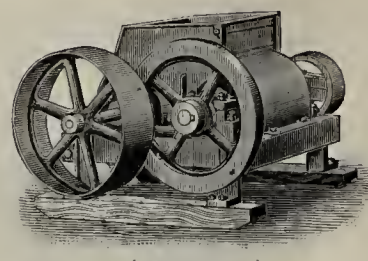
(PATENTED.)

NO

.....

Because
it Isn't
Worth While.

.....



(PATENTED.)

Therefore the extensive counterfeiting of the **Potts Disintegrator**, is the strongest evidence of it's merit.

Made in any size to suit large or small yards.

It never fails to do all we claim for it. It has entirely superseded the roller crusher. Works in any clay. Never chokes or clogs; either grinds or separates the stone.

BEWARE Of these counterfeits and write us for information and prices. We can save you money. You take no chances.

.....

C. & A. POTTS & CO.,

420-428 West Washington St.,

INDIANAPOLIS, IND.

•••WRITE FOR PRICES.♦♦•

No. 146. TURNABLE.	No. 150. STEEL BOTTOM DUMP.	No. 170. STEEL SIDE DUMP.	No. 201. OAK SIDE DUMP.
	THE ATLAS BOLT & SCREW CO., CLEVELAND, O., U.S.A. MANUFACTURERS OF STEEL BRICK DRYER CARS, SMALL CARS OF ALL KINDS, STEEL DRY KILN, LUMBER TRUCKS, STRONG, LIGHT AND EASY RUNNING. FULL LINE STEEL WHEELBARROWS.		
No. 142. TRANSFER CAR.			No. 105. SOFT MUD FLAT.
No. 124. DOUBLE DECK.			No. 103. STIFF MUD FLAT.
No. 126. O.D. STEEL DECK.			No. 109. FLAT, STEEL DECK.
No. 136. 3 SECTION RACK.	No. 133. SOFT MUD RACK.	No. 140. BOX SHOCKS, Etc.	No. 139. SHINGLES, STAVES, Etc.

The ATLAS BOLT & SCREW CO.,

Successors to

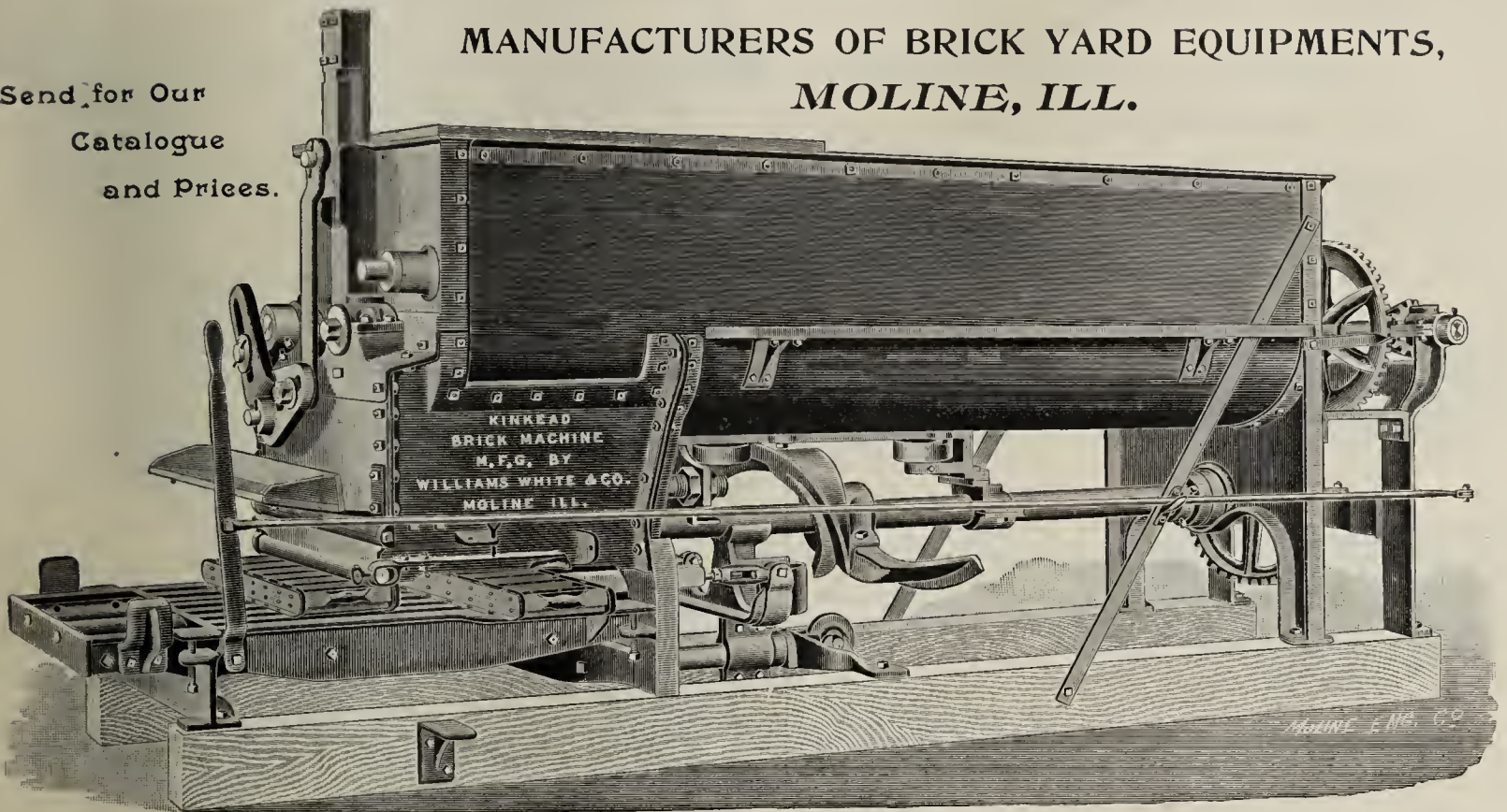
The BALL-BEARING CAR WHEEL & MFG. CO.

Cleveland, Ohio.

WILLIAMS, WHITE & CO.

MANUFACTURERS OF BRICK YARD EQUIPMENTS,
MOLINE, ILL.

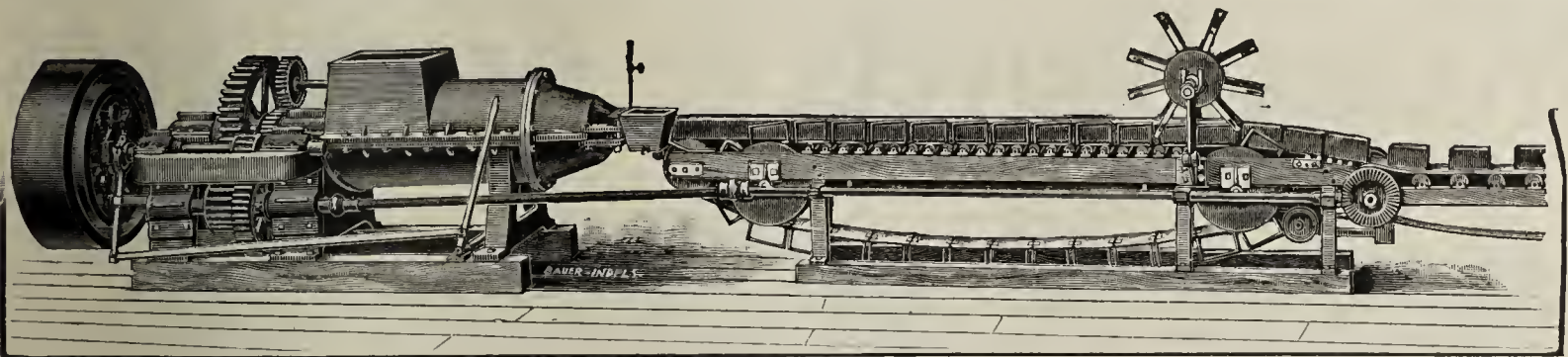
Send for Our
Catalogue
and Prices.



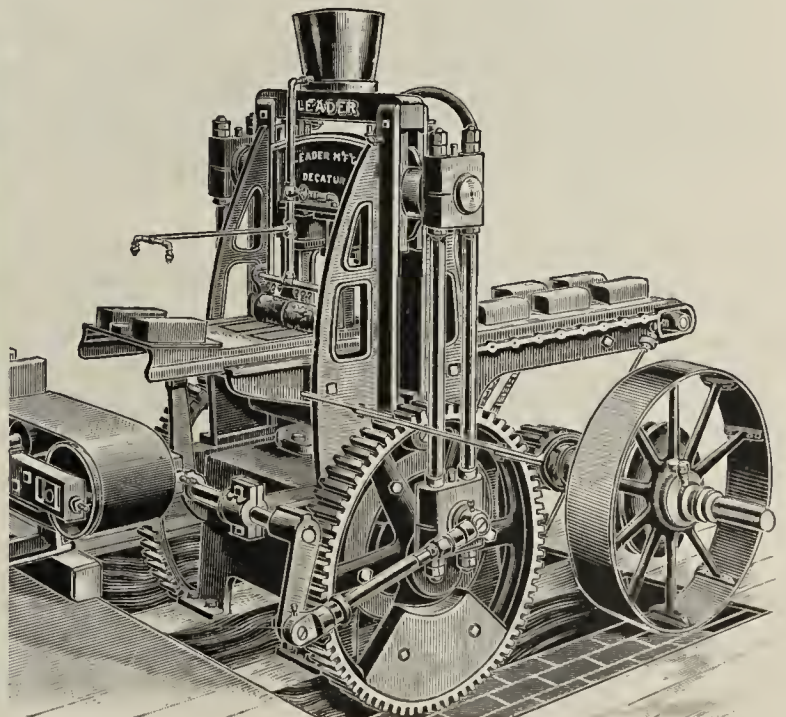
The **KINKHEAD MACHINE** takes the clay direct from the bank, preparing it more thoroughly than any pug mill or machine on the market. It fills the mold full and sharp every time. It is simple in construction, easy to take care of, and durable.

We solicit correspondence also on complete outfits for brickyards—molds, trucks, barrows, cars of all kinds, elevators, sanders, disintegrators, etc., etc. Get our Mold circular and prices.

(Mention the CLAY-WORKER.)



LEADER
MANUFACTURING CO.
DECATUR ILL.
MANUFACTURERS OF
BRICK MACHINES, BRICK PRESSES,
PUG-MILLS, CRUSHERS
DISINTEGRATORS, AUTOMATIC CUTTERS,
+ ELEVATORS +
AND
COMPLETE OUTFITS.
SEND FOR PRINTED MATTER.

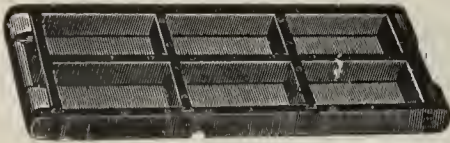


ARNOLD'S

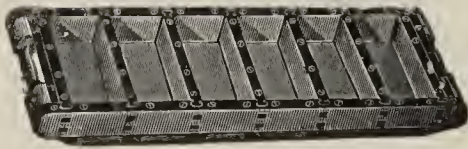
BRICKYARD SUPPLIES,
Are the Standard.



3 Brick Hand Mold.



6 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

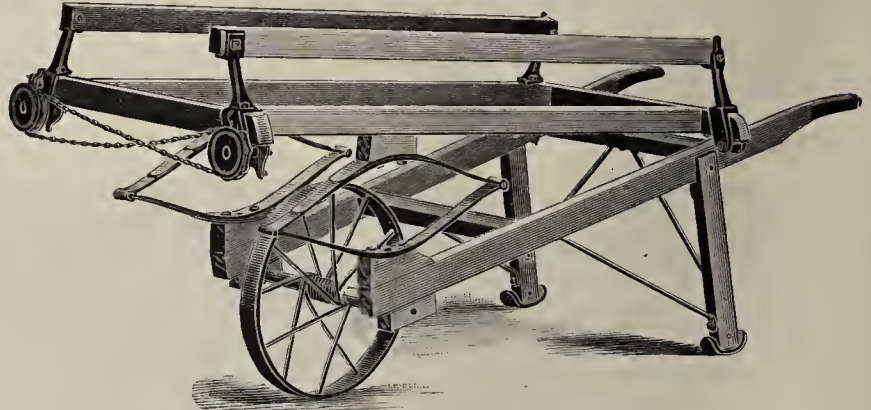
We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

Send for catalogue and price list. Address,
D. J. C. ARNOLD, New London, Ohio.

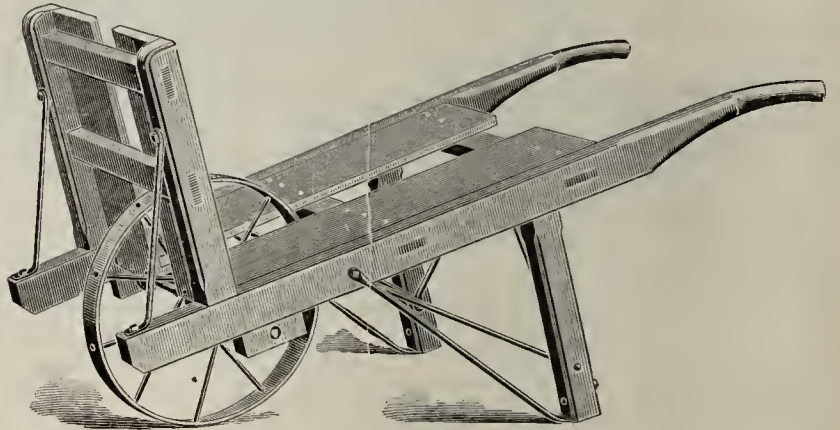
TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market.

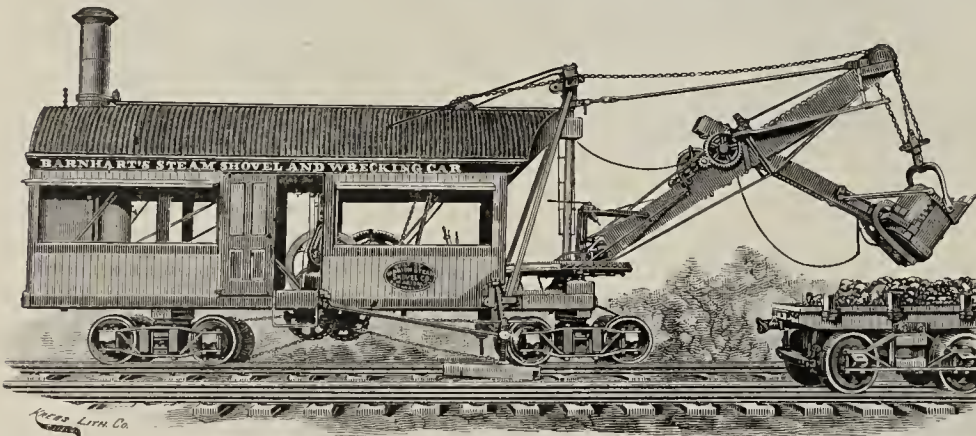
BARROWS, For Various Purposes.

Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind.



No. 4 Brick Barrow.

Steam Shovels for Brickyards.



STYLE A-1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

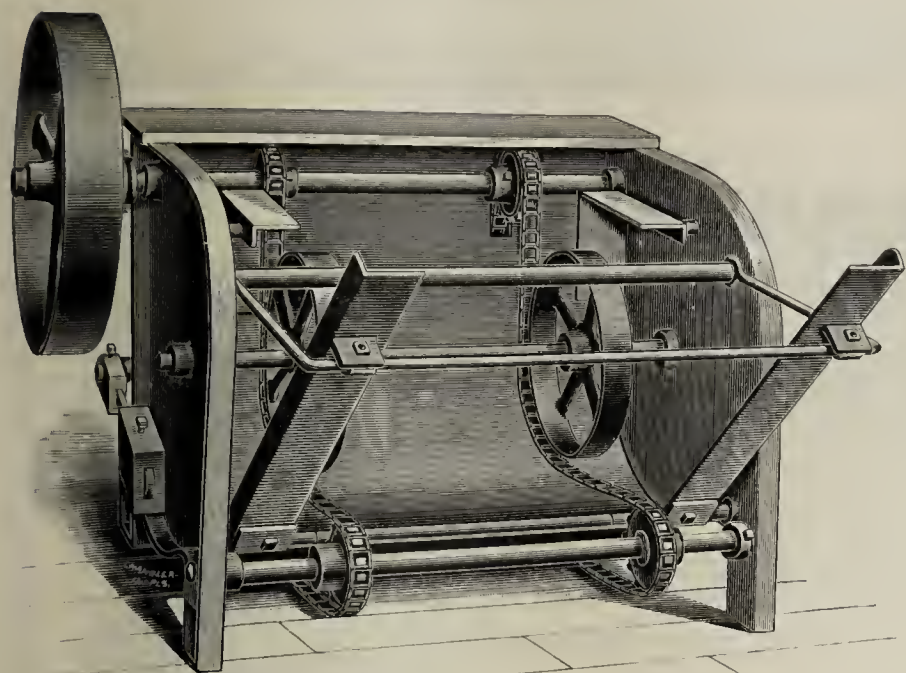
The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.



STYLE C-¾ YD.



(PATENTED.)

The Potts Mould Sander.

MADE EITHER WITH CHAIN
or RUBBER BELT.

....

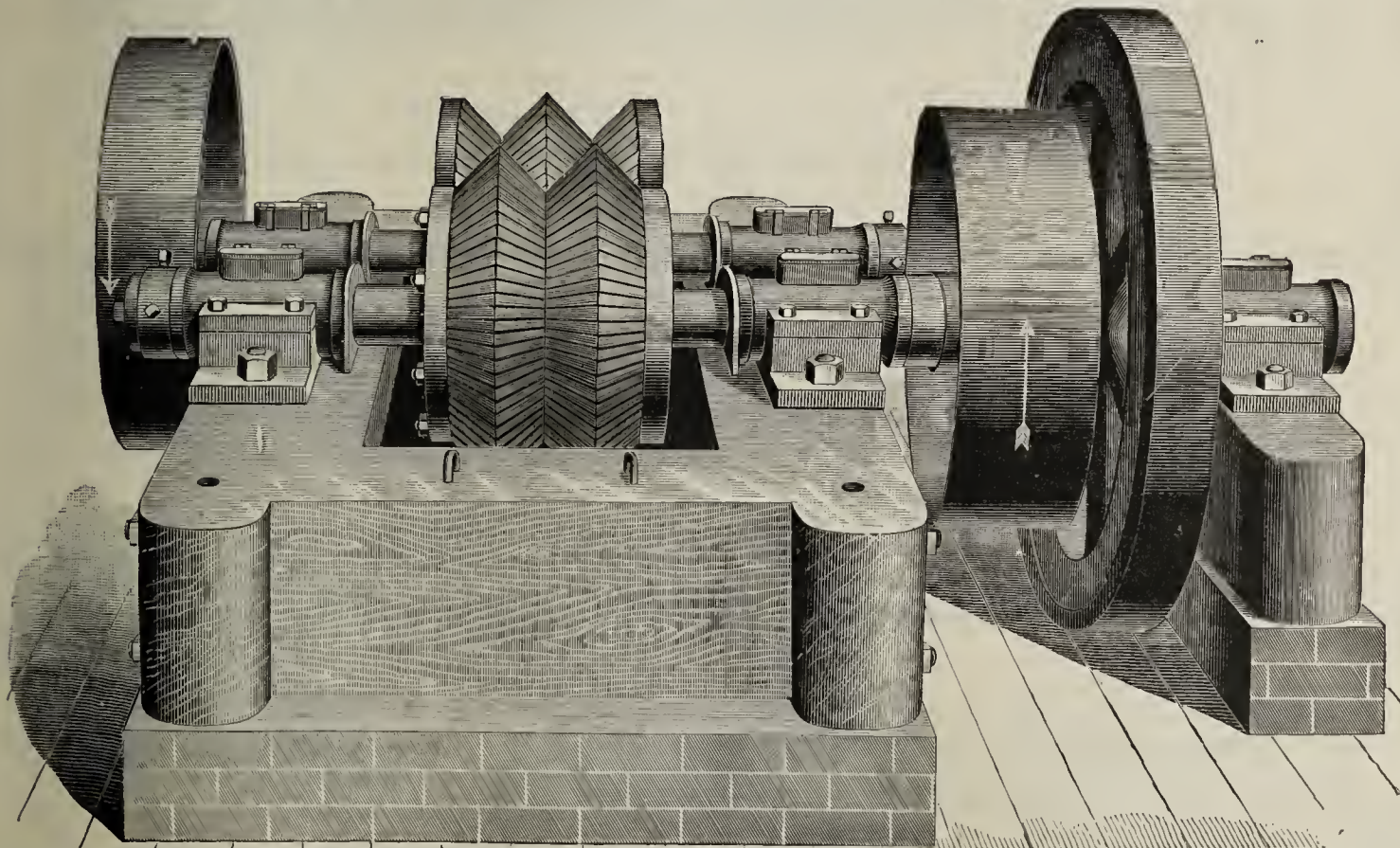
They are simple in construction, strong and durable. Never strike or get drunk. Do the work better than can be done by hand.

Now is your chance. For a short time we will sell this machine for considerably less than **\$100.** **Beware** of infringing machines.

C. & A. POTTS & CO., Indianapolis, Ind.

NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.

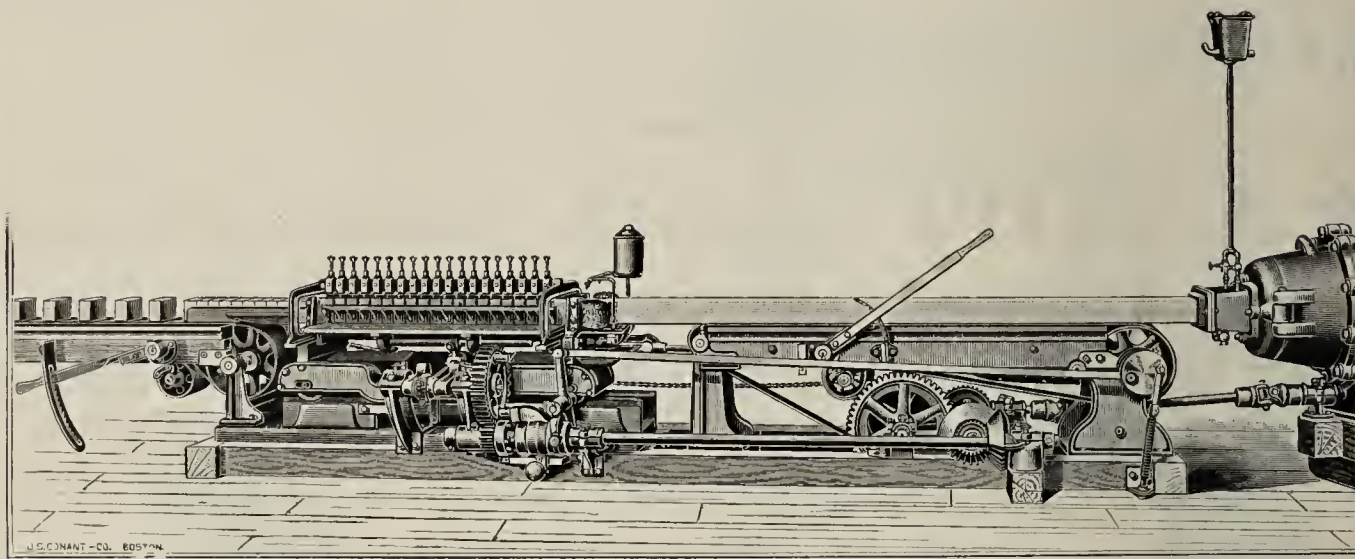


Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building
26 Cortland and 21 Dey Streets, New York, U. S. A.

It Never Disappoints!

OUR Automatic Side-Cut Table, here shown, is recognized as having many points of superiority. Being the pioneers in the Automatic Table field, as well as in most other noted improvements in brick and tile machinery, we have the most experienced artisans in this line. Our research for the best has been constant and tireless and we have no hesitation in leaving the trade to test our machines and render such verdict as they may see fit.



AUTOMATIC CUTTER AND SEPARATOR FOR SIDE-CUT BRICK.

If you have any idea of increasing your capacity, write us; we will tell you fully what our **Automatic Cutting Table** will do for you. It is a money maker and a money saver. Better write to-day, we may be able to show you how to make some needed changes at very little cost, which will nearly double your capacity, and that too at no extra expense for labor.

Have you seen our 1897 Catalogue. Its yours for the asking.

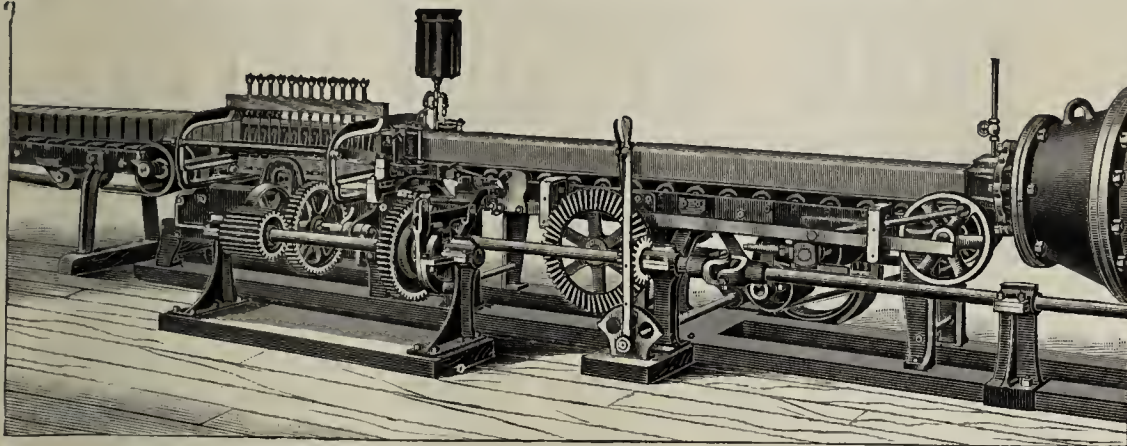
DOING
BEATS
PROMISING.



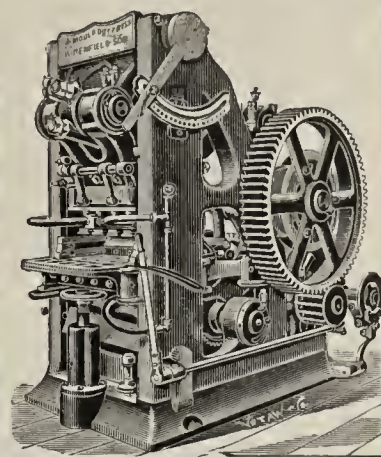
The American Clay-Working
Machinery Company,

BUCYRUS, OHIO.

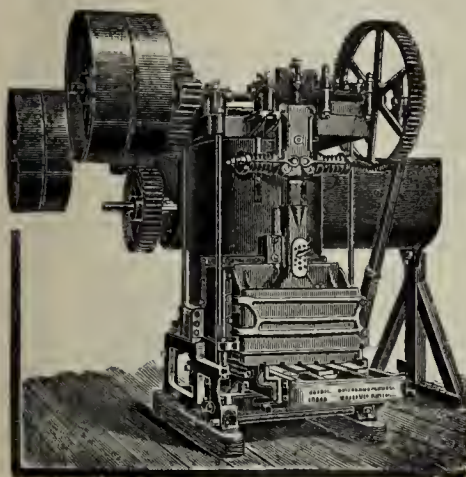
Ring us Up,
Long Distance Phone No. 90.



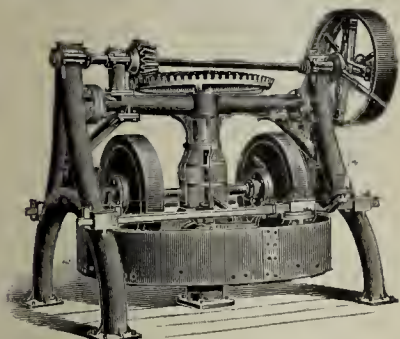
Automatic and Hand Power Brick Cutters.



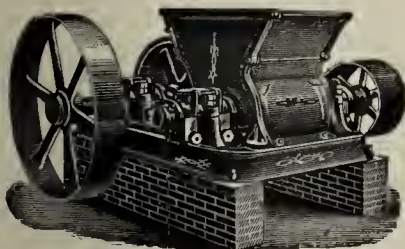
Dry Press Brick Machines.



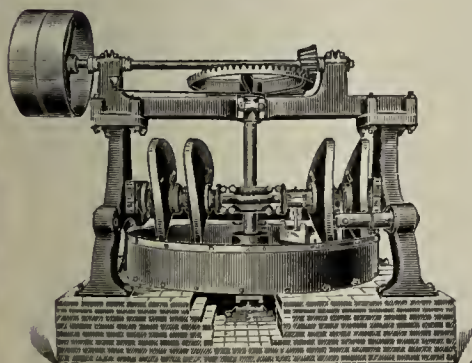
Sand Mold Brick Machines.



Dry and Wet Pans.



Disintegrators.



Special Clay Grinding Mills.

THE WINNING LINE.

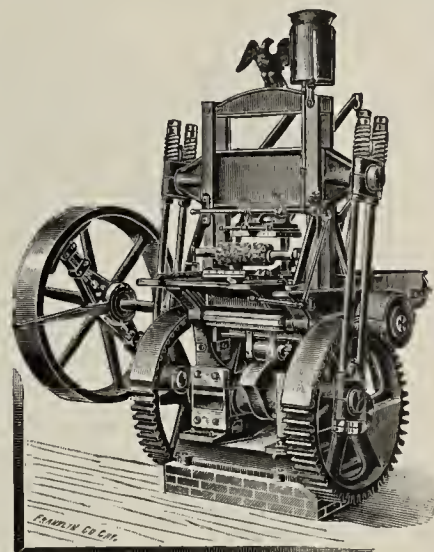
In machinery, as in everything else, the best is most economical in the long run. There is but one "Best" and our constant effort and aim has been to win for our line this desired title.

Those who are using our machinery affirm that our efforts have not been in vain. All that experience and genius can devise, are embodied in every machine in our line. This coupled with honest construction under the eye of skilled experts, make a combination which insures your being pleased and not disappointed. Our machinery can be depended upon in any emergency.

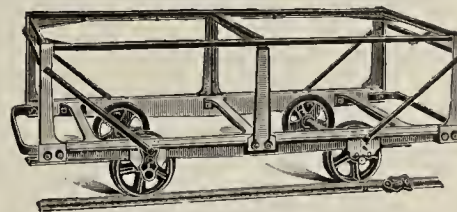
You are in business for the money there is in it; with our line of Brick and Tile Machinery, we can help you attain your object. You are progressive and will want to improve. Write us to-day, we can assist you at very moderate cost. If you have not yet seen our new and complete catalogue, send for it at once. It is yours for the asking.

The American Clay-Working Machinery Co.,
Bucyrus, Ohio.

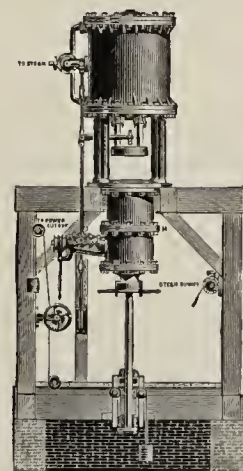
Long Distance Phone No. 90.



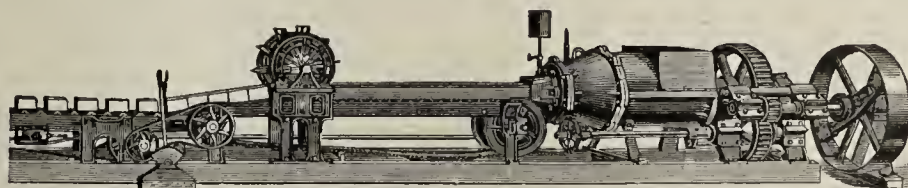
Brick Re-Presses.



No. 2 Dry Car.



Sewer Pipe Presses.



Auger Brick and Tile Machines.

HERE'S YOUR OPPORTUNITY

Positively the Greatest Bargain Ever Offered!

8 LARGE VOLUMES. Nearly 4,000 pages. Over 300 Colored Maps, Charts, and Diagrams. Every Volume Mechanically Perfect.



The Only Encyclopedia Strictly "Up to Date."
SIZE OF VOLUME:
2 ins. Thick. 8½ ins. Wide. 11¼ ins. Long.

For Daily Use in Your Home or Office

and especially to aid the young folks in their studies, no single work in the world equals that matchless Reference Library,

The New Standard American Encyclopedia

A SUPERB REFERENCE WORK

treating over 60,000 topics (10,000 more than any other encyclopedia), covering the entire field of human knowledge, thought, and endeavor.

FRESH FROM THE PRESS

The NEW STANDARD AMERICAN ENCYCLOPEDIA is brought down to the present time, and contains hundreds of articles on subjects not treated in any other reference work. Another important feature in which it stands absolutely alone is its very full Appendixes, which embrace over 100 subdivisions, including a Biographical Dictionary, a Dictionary of Technical Terms, a Gazetteer of the United States, Statistics of Presidential Elections, State and Territorial Elections, Religious Summaries, Statistics of the Population of the World, and a Veritable Mine of Other Information on thousands of subjects of universal interest and importance.

IT IS NOW THE STANDARD

Every school, college, court and public library, where the work has been thus far introduced, has immediately given it the preference over all others.

For a Limited Time Only—
Just to Introduce the work

ONE DOLLAR

secures IMMEDIATE POSSESSION OF the entire set of 8 volumes. Balance payable \$1.50 monthly for one year.

You thus at once secure this splendid set of books for continued use and enjoyment. It is the One Great, Practical Reference Library for the Professional and Business Man, the Teacher, the Student, the Farmer, Artisan, and Mechanic.

**MAGNIFICENTLY
ILLUSTRATED
THROUGHOUT**

With over 3,500 engravings, of superb quality and wonderful variety, including numerous engraved portraits of distinguished Poets, Authors, Physicians, Chemists, Philosophers, and Scientists, and with over 300 new maps and charts from the VERY LATEST EXPLORATIONS and SURVEYS, delineating Continents, Empires, Countries, States, Cities, Towns, Citadels, Solar, Lunar, and Planetary Systems, and every portion of the known world, and forming a Complete and Indexed Atlas of the globe. THE STANDARD AMERICAN is the best illustrated and the best mapped Encyclopedia in the English Language.

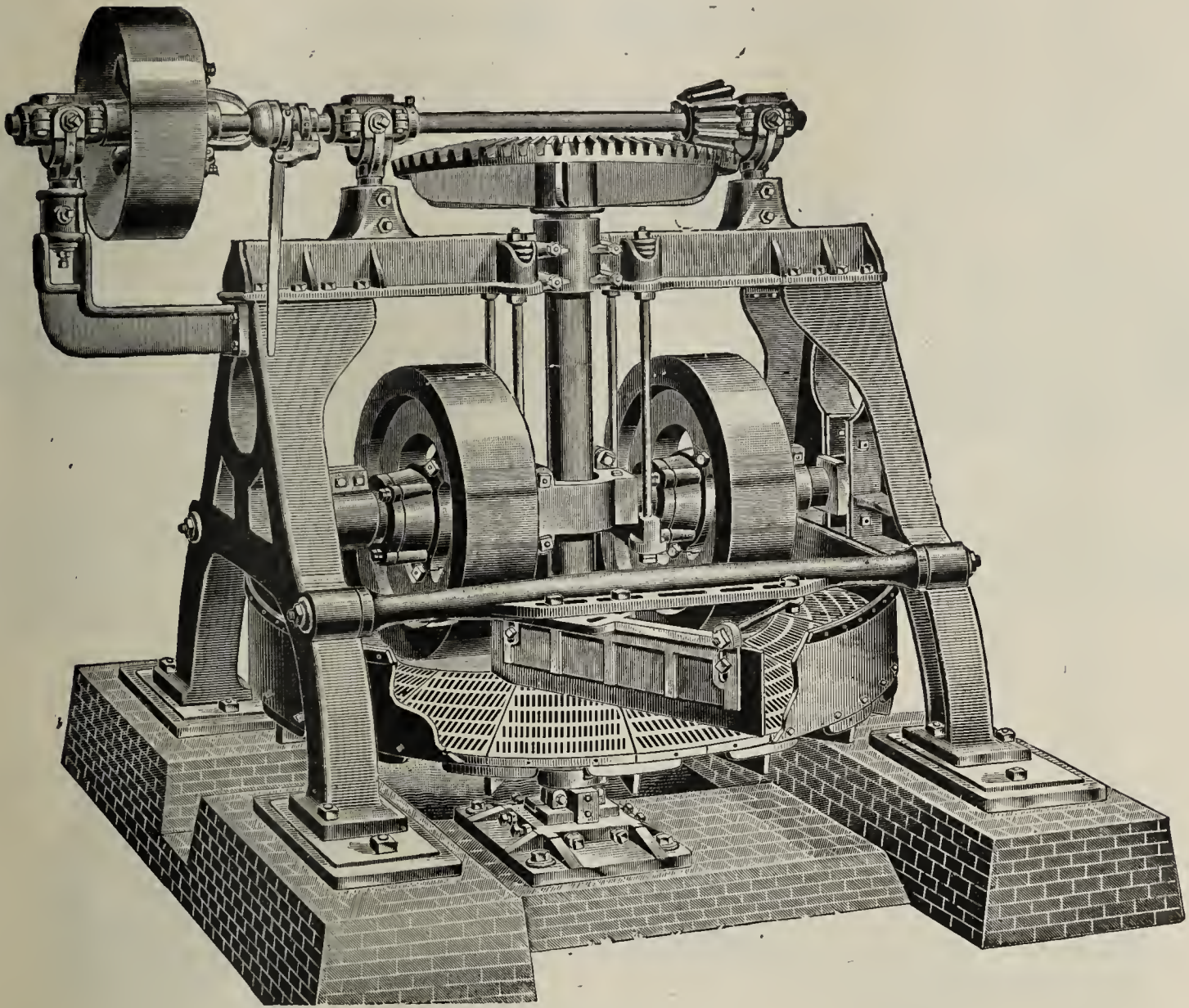
Our Great Introductory Offer

To secure widespread and favorable publicity for THE NEW STANDARD AMERICAN ENCYCLOPEDIA, we have decided to place a few introductory sets in each community throughout the country for comparison with all other reference works as to plan, scope, lateness of treatment, and general practical and educational value. We feel that every set will create a demand for others. While the distribution will be general in extent, it will last for a limited time only, after which our regular subscription sale will begin, at prices ranging from \$48 to \$72 a set, according to style of binding. Now, however, to quickly and thoroughly introduce the work, as above stated, we make the price merely nominal (about the cost of paper and printing), the distribution being limited to a very few weeks, reserving the privilege of withdrawing the offer at any time when we consider a sufficient number of these introductory sets, at the special price, has been distributed.

**HOW TO SECURE
ONE OF THESE
SPLENDID SETS**

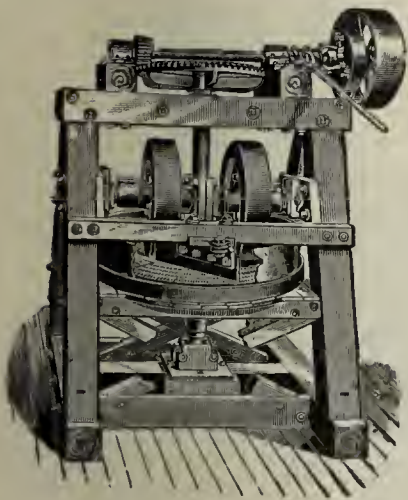
Send \$1 to THE ENCYCLOPEDIA PUBLISHING CO., 156 Fifth Avenue, New York city, and a full set of eight volumes of THE NEW STANDARD AMERICAN ENCYCLOPEDIA in cloth binding, will be forwarded to you. The balance is payable at the rate of \$1.50 monthly for one year, or about 5 cents a day. If you prefer the half-morocco binding, the monthly payment will be \$2, and for full sheep, \$2.50 per month for the year. We recommend the half-morocco style, which is particularly elegant and serviceable, and will last a lifetime. If not as represented any set may be returned within ten days and money will be promptly refunded. Owing to the nominal price at which these introductory sets are sold, transportation charges must be paid by purchaser. Our confidence that the volumes will be cheerfully paid for is shown by sending a \$48 set of books on payment of only \$1. We also feel that you will thoroughly appreciate the superb new work and speak favorably of it to others. Sample pages, with specimen illustrations, will also be sent on application until the offer is withdrawn. We refer you to the publisher of this newspaper. Always mention name of paper you see this offer in. Address

**THE ENCYCLOPEDIA PUBLISHING CO., 156 FIFTH AVENUE,
NEW YORK, N. Y.**



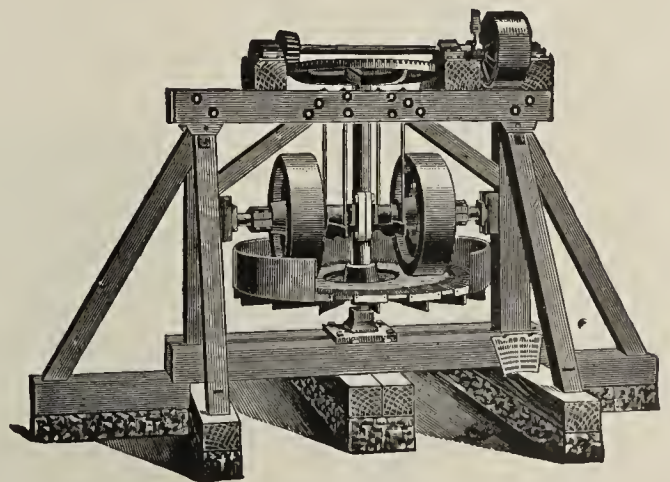
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,
WOOD FRAMES.

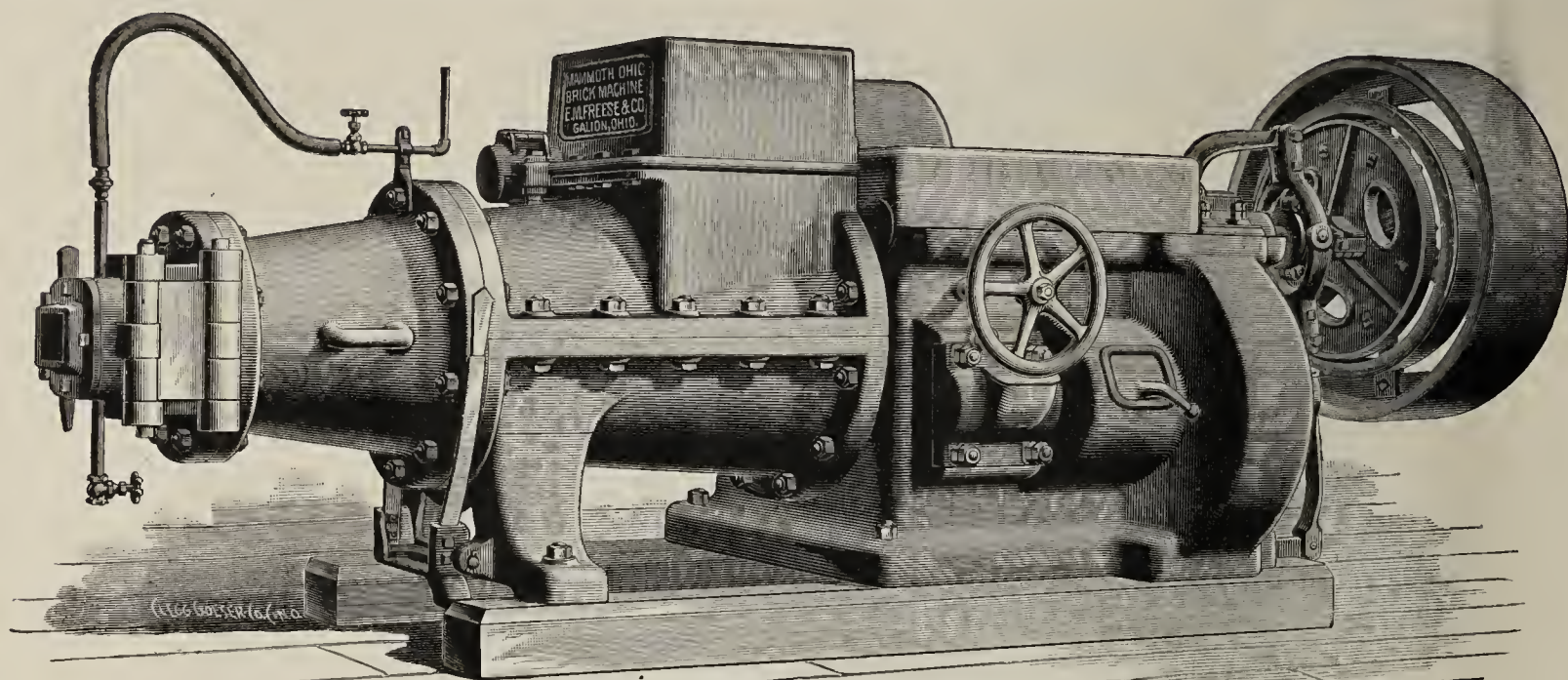
~~~~~  
All Sizes and Price  
to suit  
Any Size Plant.  
~~~~~



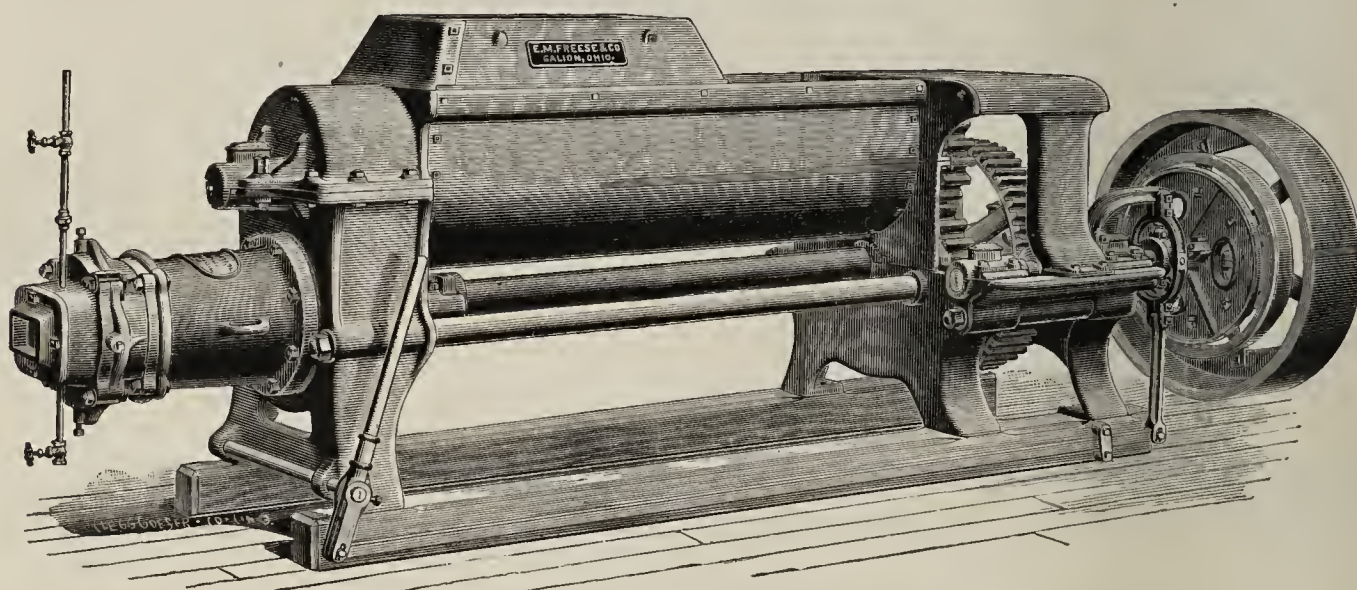
.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.

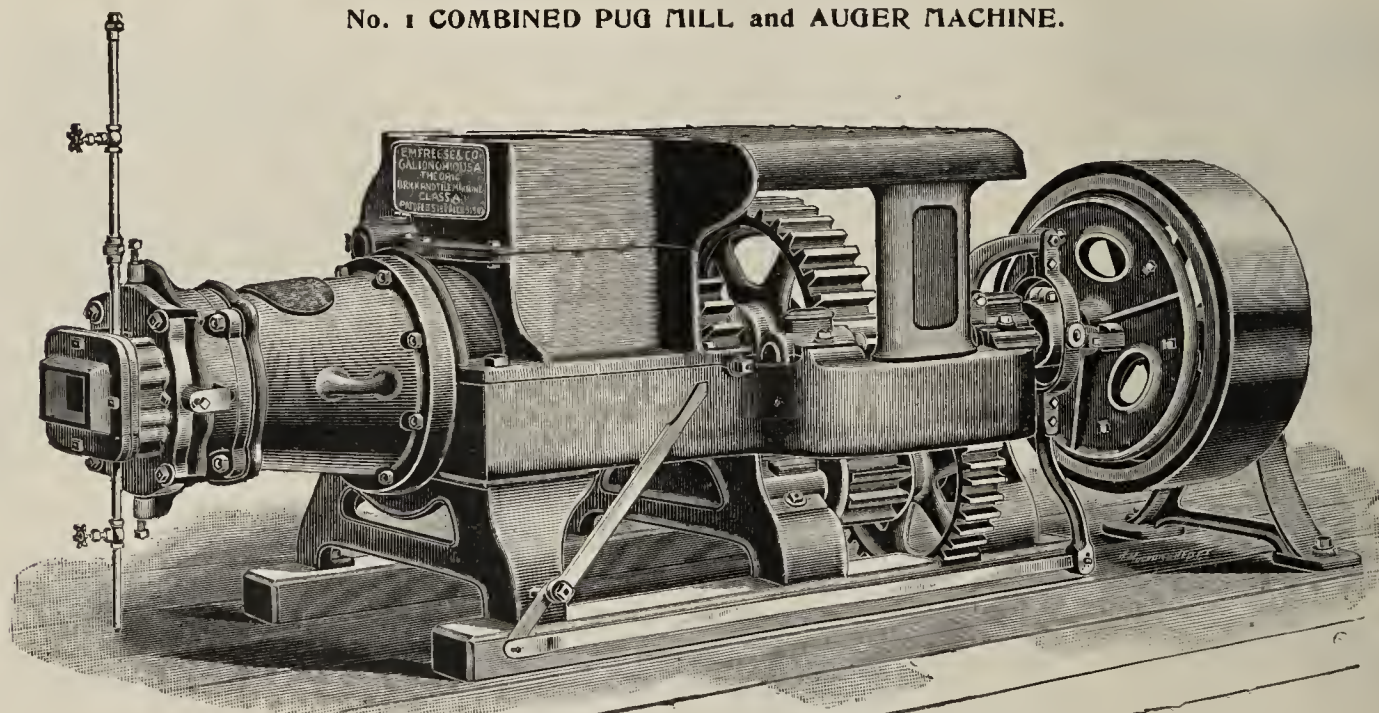
E. M. FREESE & CO., GALION, OHIO.



MAMMOTH BRICK MACHINE.

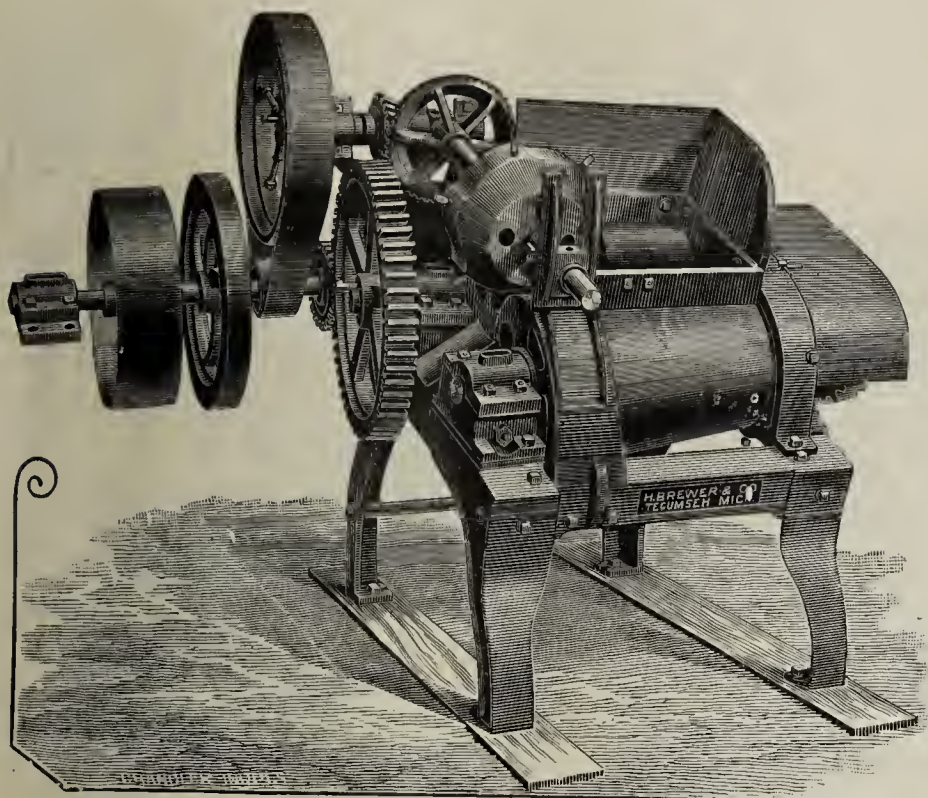


No. 1 COMBINED PUG MILL and AUGER MACHINE.



IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

Send for 136 page Catalogue.

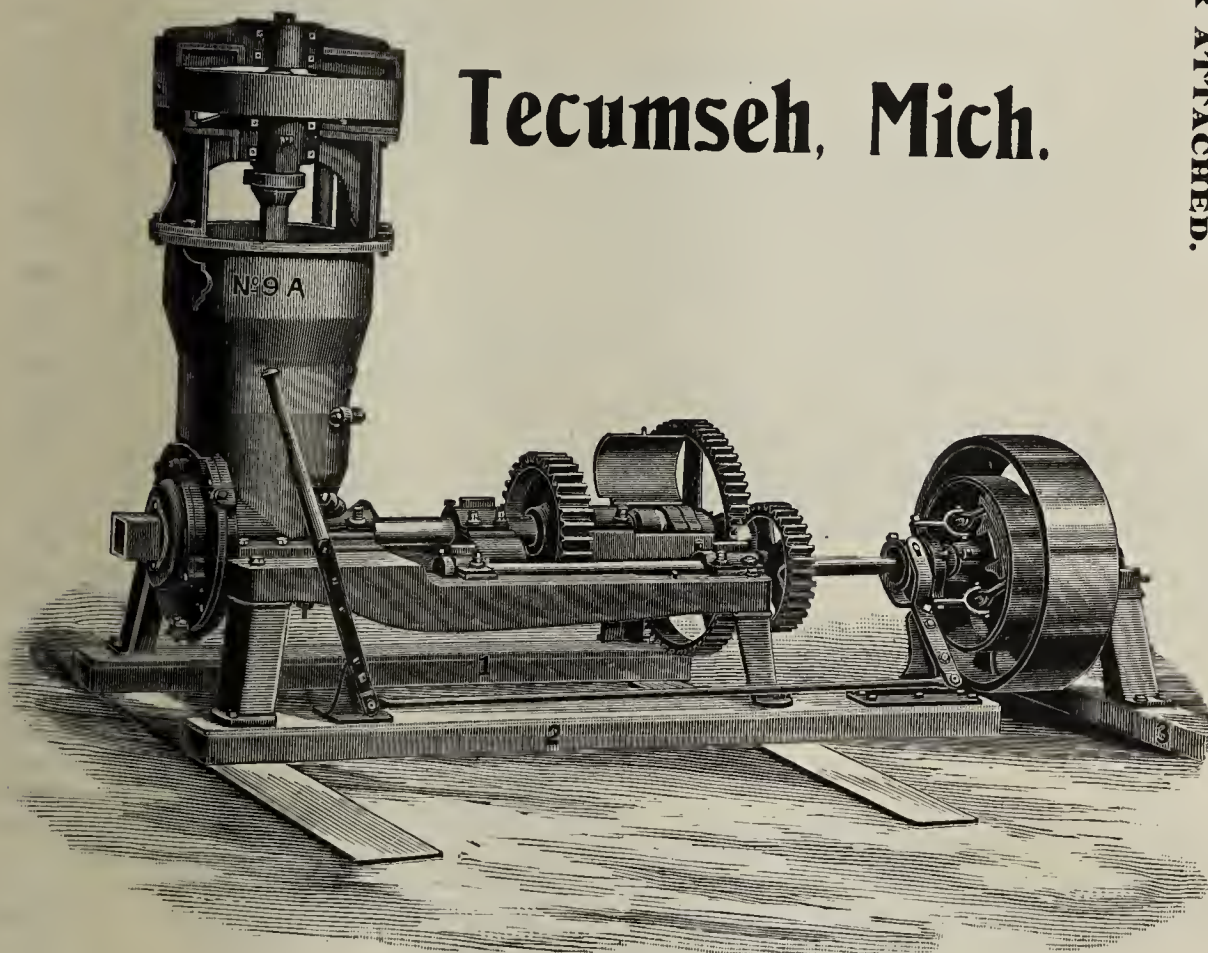


STONE EXTRACTING CLAY CRUSHER.

Manufactured by

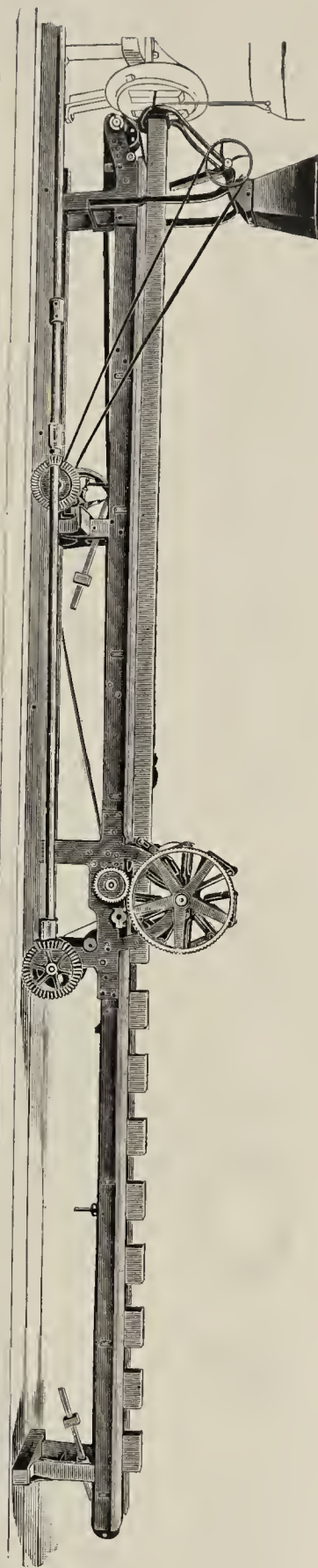
H. Brewer & Co.,

Tecumseh, Mich.



NO. 9 "A" BRICK MACHINE.

AUTOMATIC END CUT BRICK CUTTER WITH SANDER ATTACHED.



TAKE YOUR CHOICE.

EITHER IRON OR WOOD FRAME.

We guarantee either to be Up-to-Date and to make as many first-class brick as any other soft mud machine in the United States.

The cut on the right shows our Iron Horse power machine changed to a steam power. All of our Horse-powers, both wood and iron frames, can be thus changed at a small expense.

Especial attention is called to the square steel shaft and heavy grinders and gearing of this machine.

If in need of a

PUG MILL,
DISINTEGRATOR,
SANDER, ELEVATOR,
TRUCKS, BARROWS,
... MOLDS, Etc.,

Write us for prices.

...

For Sale,

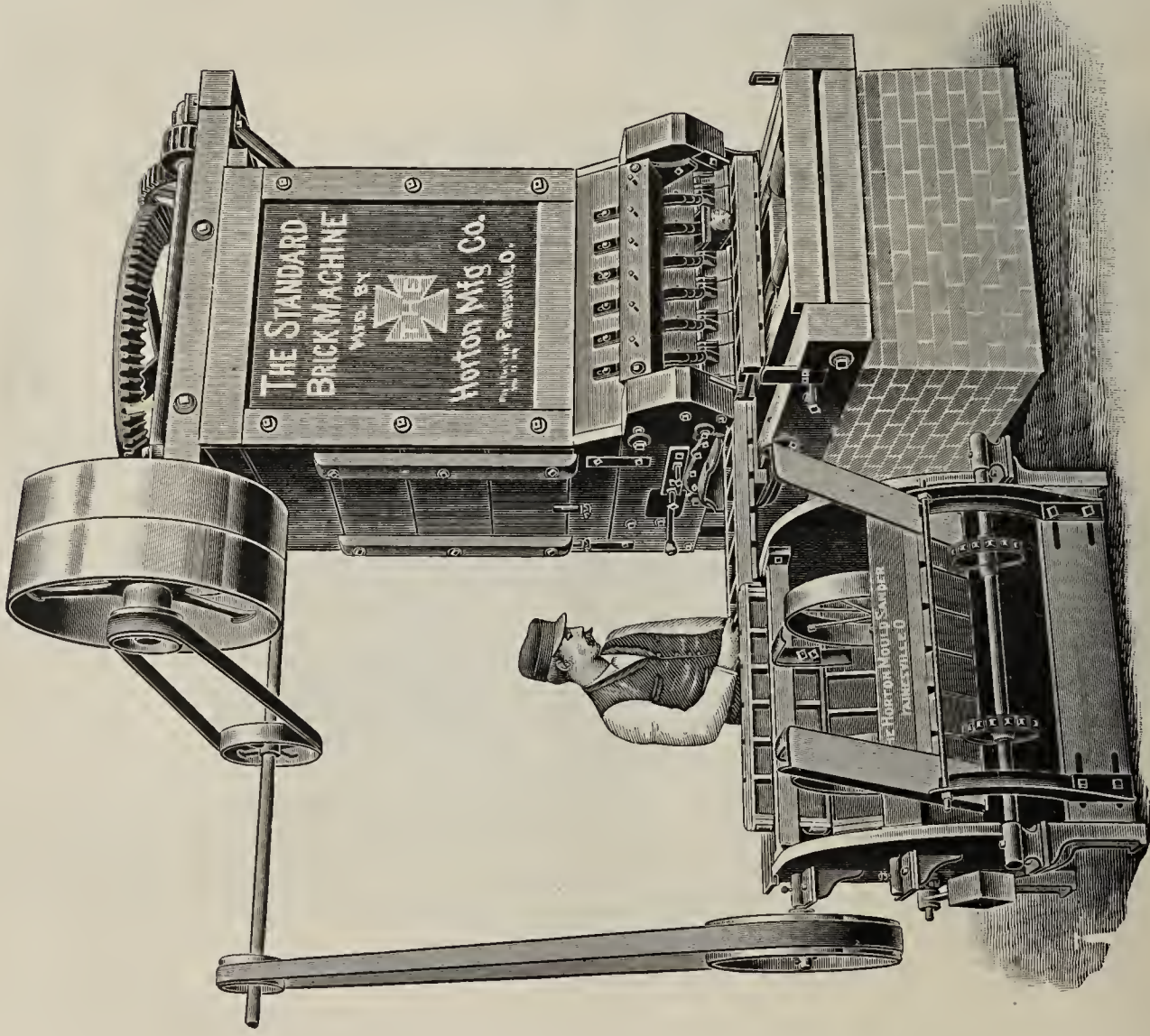
At a very low figure:

One Columbian Special Repress, second-hand but practically as good as new.

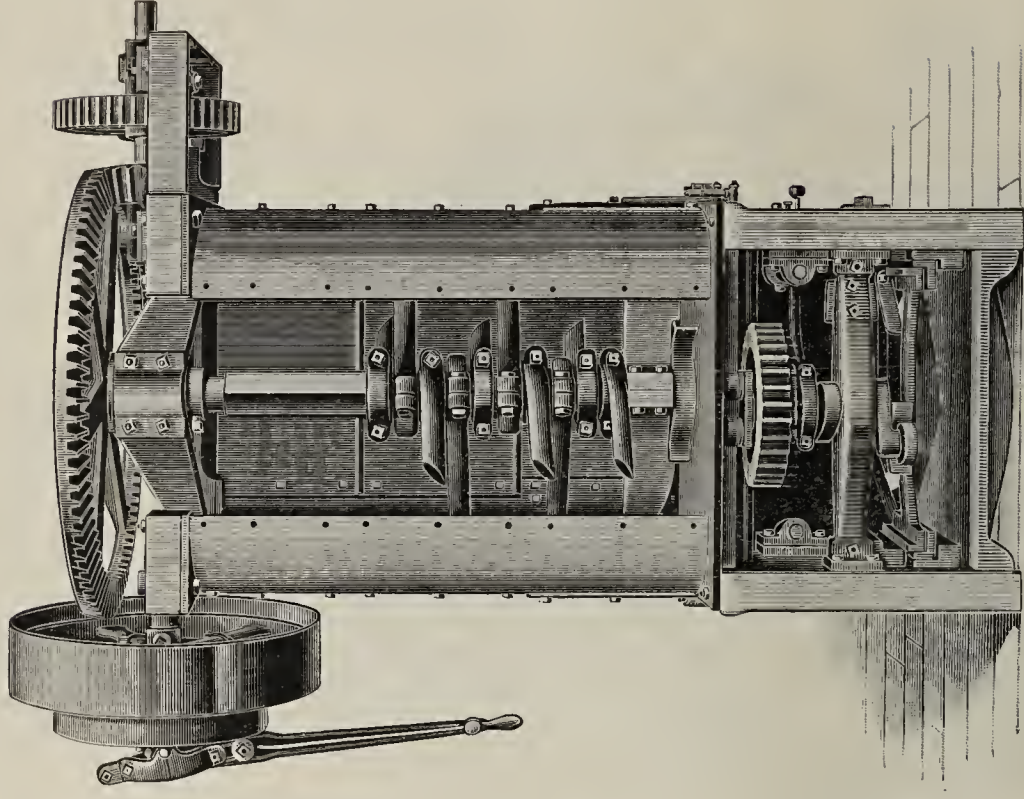
About one ton of second-hand Grates, from 40 to 42-inch length. A bargain at \$30 per ton.

Odd size molds:

5—8 $\frac{3}{4}$ x4 $\frac{1}{4}$ x $\frac{3}{4}$ / $\frac{1}{4}$
10—9x4 $\frac{3}{4}$ x2 $\frac{3}{4}$ / $\frac{5}{8}$
10—9 $\frac{1}{2}$ x4 $\frac{1}{2}$ x2 $\frac{3}{4}$ / $\frac{5}{8}$



"Extra Heavy" Wood Frame Steam Power with Sander Attached.



Interchangeable Iron Horse and Steam Power.

THE HORTON MANUFACTURING CO., = Painesville, Ohio.

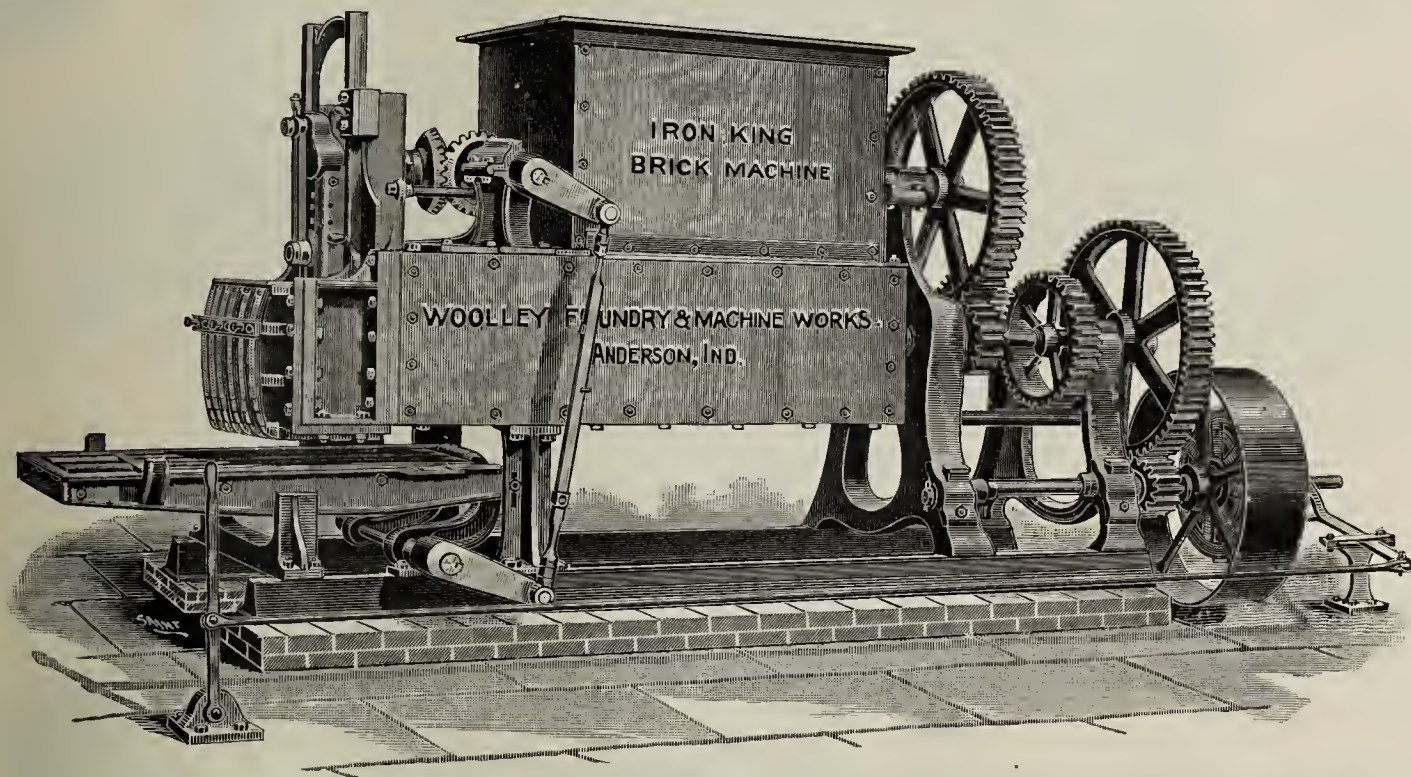
Do You Want A BRICK MACHINE A DRY PAN A PUG MILL?

IF SO, BE SURE AND LOOK INTO THE MERITS OF

The Iron King A BRICK MACHINE that has never made a failure.

The Woolley Dry Pan, The Woolley Pug Mill,

•✚All of these Machines have proven equal to any and Superior to most on the Market.✚•



THIS is a non-breakable machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ability of every part.

We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

It will afford us pleasure to quote you prices.

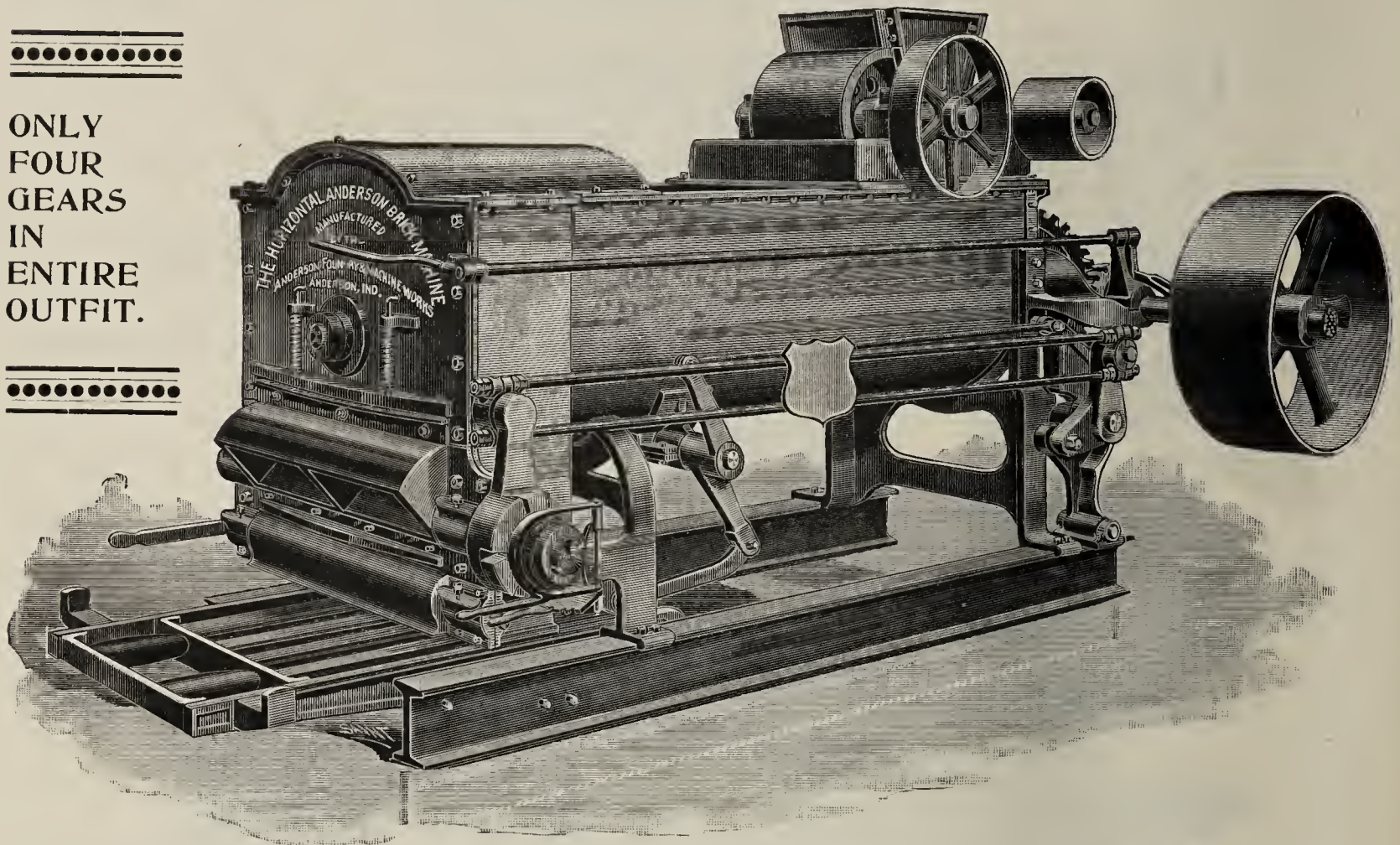


DON'T

Greatest Pressure and Puging Capacity.

Buy a Brick Machine until you Investigate the **Horizontal Andersonson.** The latest—the Strongest—

ONLY
FOUR
GEARS
IN
ENTIRE
OUTFIT.



Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.

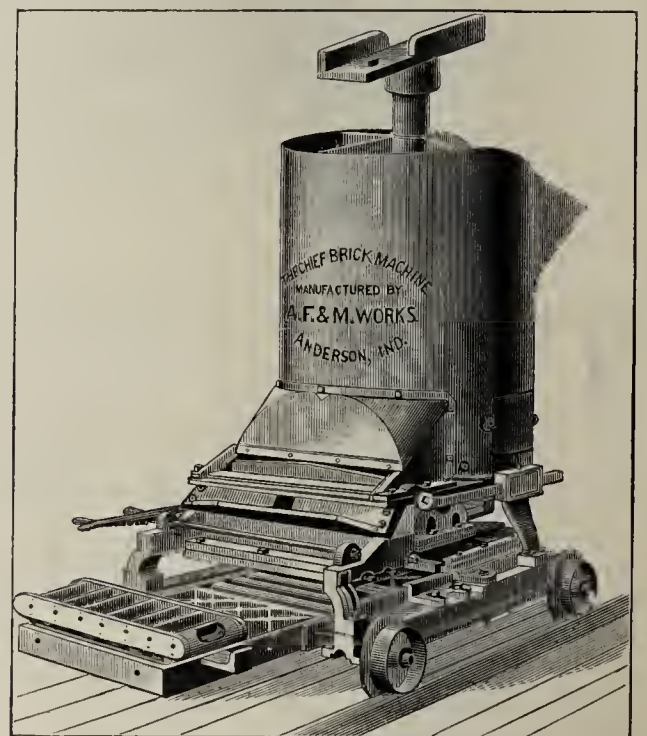
The New Departure Tile Mill



NEW ANDERSON BRICK MACHINE.
Steam Power.

The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter.

WRITE FOR CATALOGUE
AND PRICES.



NEW IMPROVED CHIEF H. P. MACHINE.

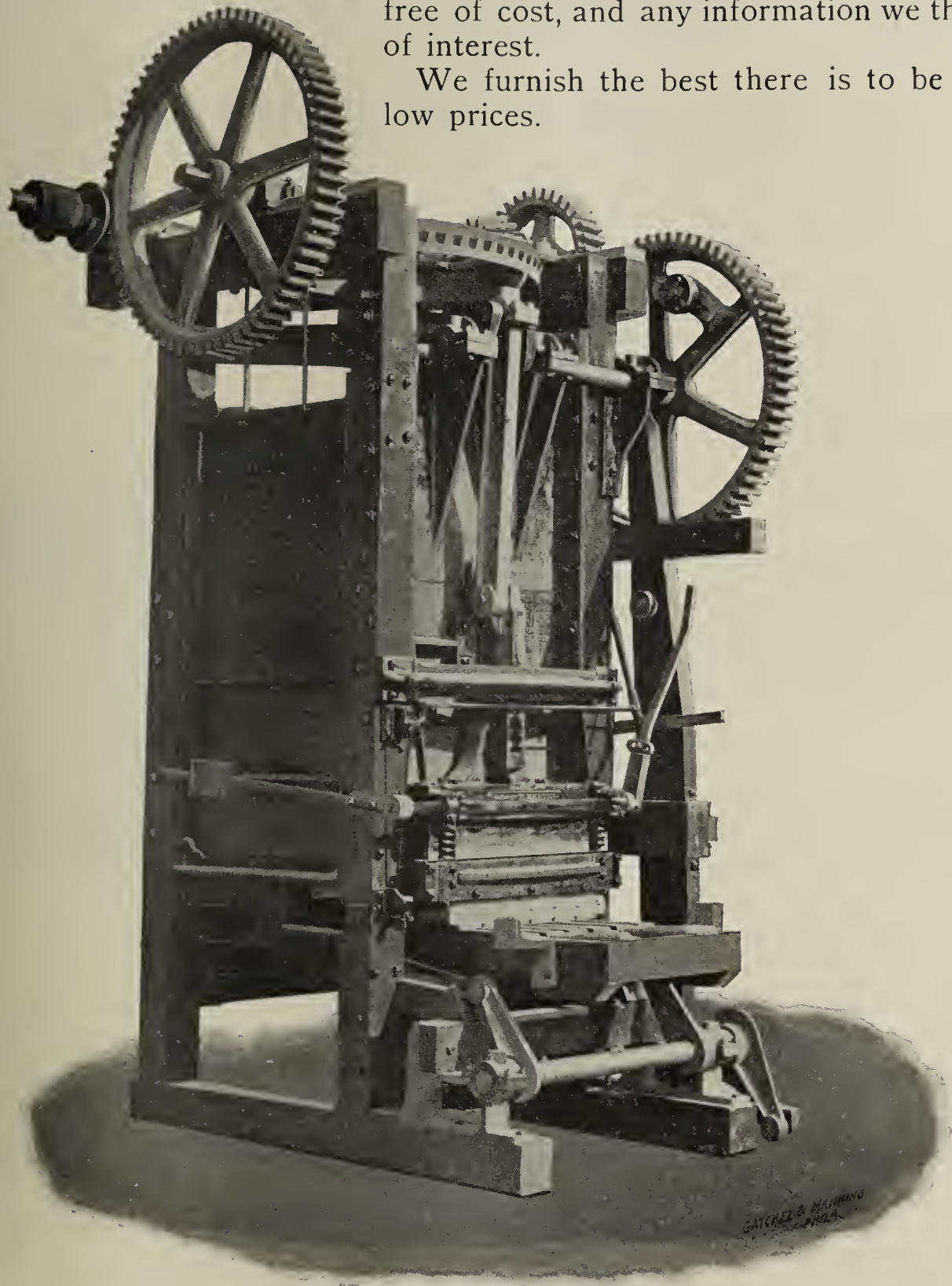
The Anderson Foundry
& Machine Works,
ANDERSON, IND.

We Furnish Everything

A Brickmaker Needs.

Let us furnish you with any information you want. We send plans of complete plants free of cost, and any information we think will be of interest.

We furnish the best there is to be had and at low prices.



Letter "A" Weight 10,000 Pounds.

ESTABLISHED 1857.

INCORPORATED 1887.

The Henry Martin Brick Machine Mfg. Co.,

Send for our Illustrated Catalogue.

Lancaster, Penna., U. S. A.

“NEW HAVEN” MACHINES

Are Not Experiments.

Record of . .

One Soft Clay Machine:

One Million Brick a Month

. . . for Eight Years. . . .

Its History Shows that it Has Been Unusually
Successful.

Address —

The Eastern Machinery Co.,

NEW HAVEN, CONN.

WONDER MACHINERY.

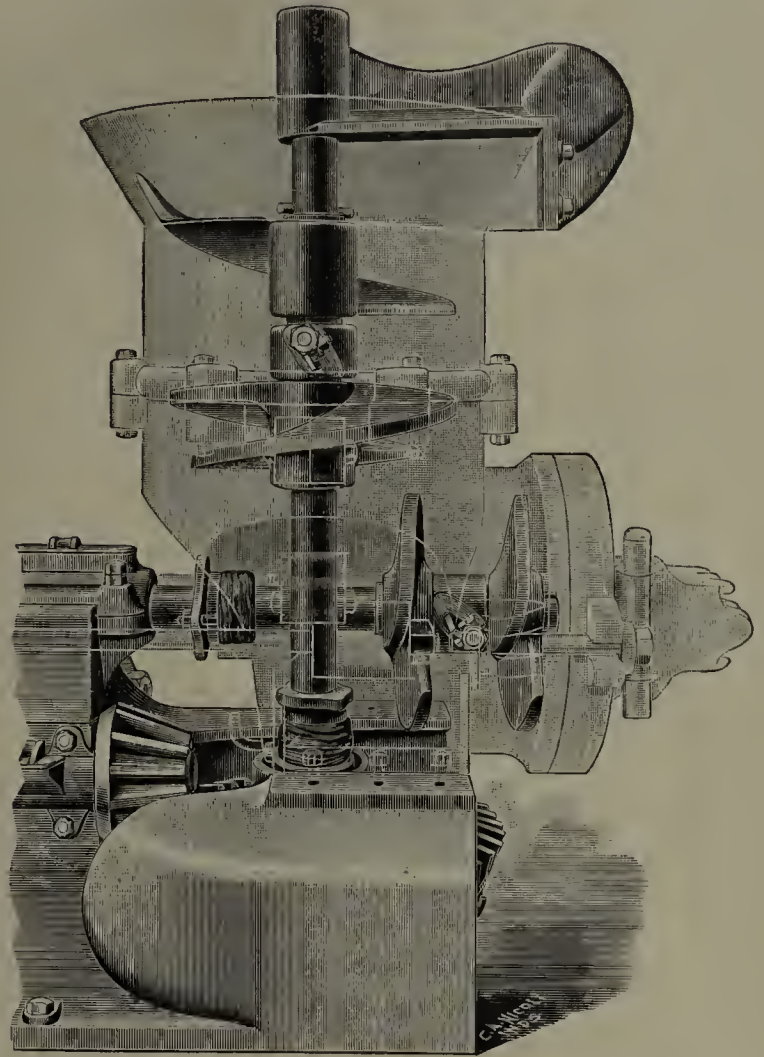
...

Transparent Cut Illustrating Arrangement of Clay Cylinder and Augers.

By this we illustrate a Transparent Clay Cylinder showing the inner construction of all sizes of the Wonder Brick and Tile Machines, showing position the augers and retarding bars occupy, also that there is no journal bearing that the clay can work into and also the means used to prevent the clay from working out of the clay cylinder. By this illustration you will see that we are justified in making the claim that we more thoroughly grind the clay and thereby produce brick with less lamination than can be done by the horizontal auger machines.

Automatic Brick Cutting Tables, either end or side cut, also side cut board delivery and hand brick tables are used with either size of the Wonder machines.

...

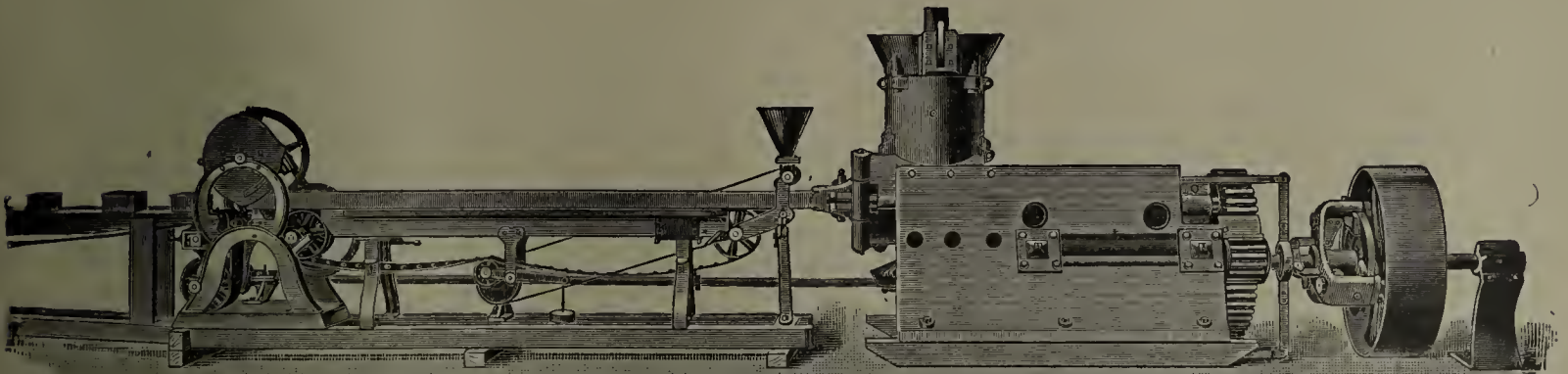


Little Wonder Brick and Tile Machine, 25 M daily capacity.

Intermediate Wonder Brick and Tile Machine, 35 M daily capacity.

Big Wonder Brick Machine, 50 to 60 M daily capacity.

Wonder No. 4 Brick Machine, 60 to 100 M daily capacity.



Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.

AS MANUFACTURED BY ~~~

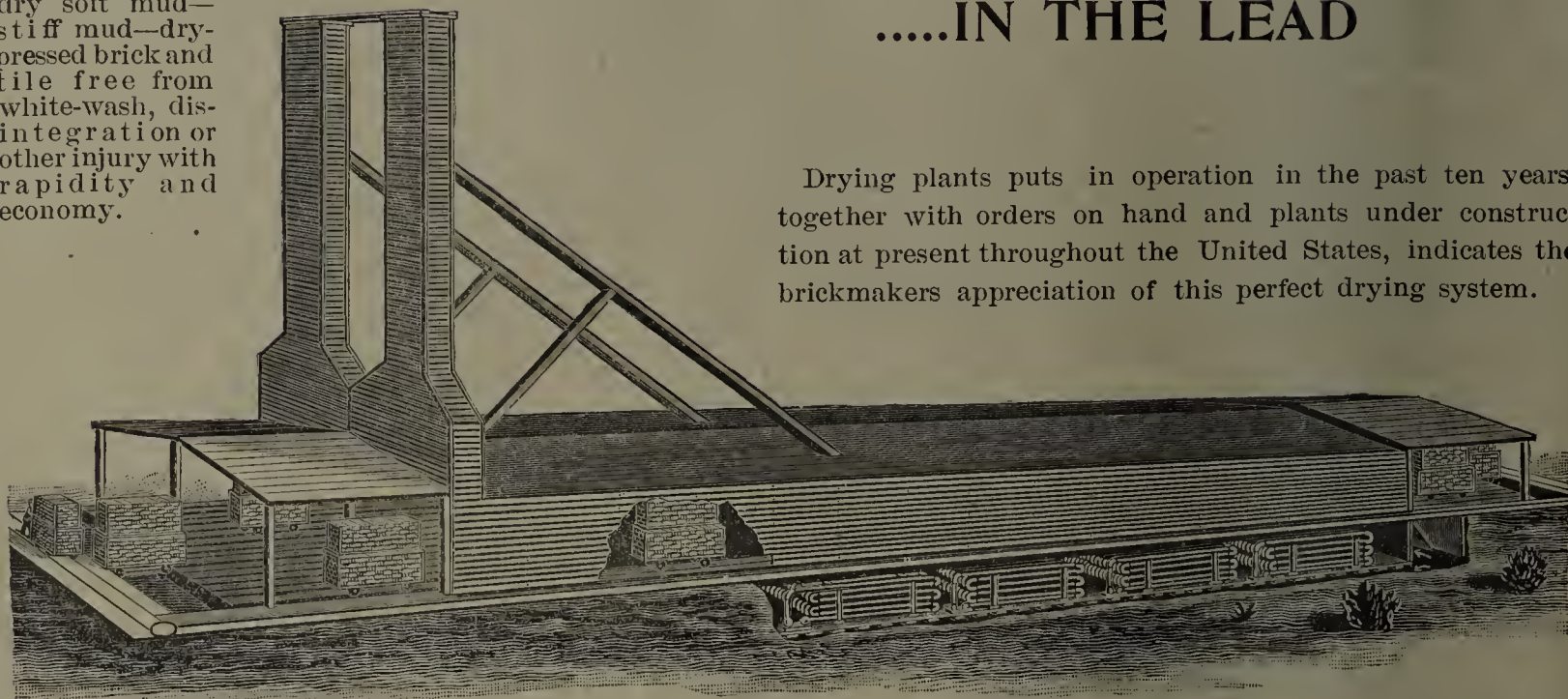
The Wallace Manufacturing Co.,

Send for No. 15 Catalogue for further particulars.

FRANKFORT, IND.

Iron Clad Dryer

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



.....IN THE LEAD

Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

SEE WHAT THEY SAY:

DALE-GOODWIN PRESSED BRICK CO.

DIRECTORS:

Robt. Goodwin, President.
F. H. Parmenter, Vice-Pres.
E. E. Dale, Sec. and Treas.
Daniel Embree.
Frank Dale.

MANUFACTURERS OF

Building Brick.

FINE FRONT BRICK A
SPECIALTY.

Telephone 394.
Lock Box 303.

100 SOUTH FIFTH ST.

DES MOINES, IA., July 20, 1896.

WOLFF DRYER CO., Chicago, Ill.

GENTLEMEN—The four-track dryer bought of you has reduced the length of time in water smoking from seven and eight days to three days, evaporating from seven to nine ounces from each brick of standard size.

Our contract was for a capacity of thirty thousand standard brick per day; the dryer will easily do this.

Very truly yours,

DALE-GOODWIN PRESSED BRICK CO.,

E. E. DALE, Sec. and Treas.

D. WARREN De ROSAY,

STEAM BRICK MANUFACTURER,

Cambridge, Mass.

OFFICE AND WORKS
62, 64, 66 Dublin St.
Telephone 532-4 Cambridge.

BOSTON OFFICE
17 Otis Street.
Telephone 1892 Boston

CAMBRIDGE, MASS., July 29, 1896.

WOLFF DRYER CO., Chicago, Ill.

GENTLEMEN—I have used your six-track dryer since April 15, 1896, and am pleased to say that it gives entire satisfaction. It was built for a capacity of 25,000 soft mud brick per day, but at present I am running at the rate of 30,000 "BONE DRY BRICK" daily. I must confess that with this dryer the art of brick making is reduced to a science, and that the days of open yards are numbered.

Wishing you more success of the kind, I remain,

Respectfully,

D. WARREN DE ROSAY.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

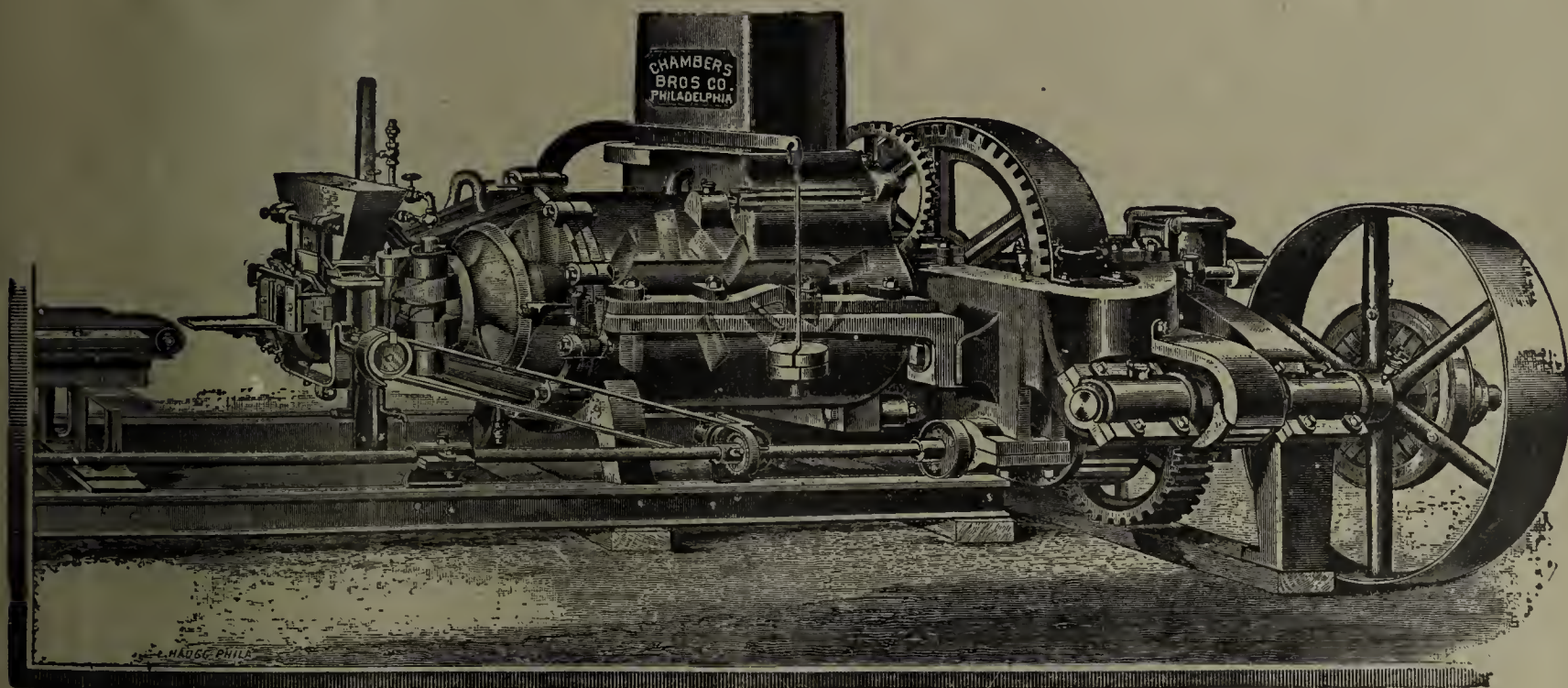
VOL. XXVII, No. 5.

INDIANAPOLIS, IND., MAY, 1897.

\$2.00 a Year in Advance.

OUR SPECIALTY IS STIFF TEMPERED BRICK MAKING ...MACHINERY.

We aim to Build only the Best in its Class.
It has Paid our Customers to Buy and Use our Machines.
We Believe it would Pay You.



Chambers Brothers Company,

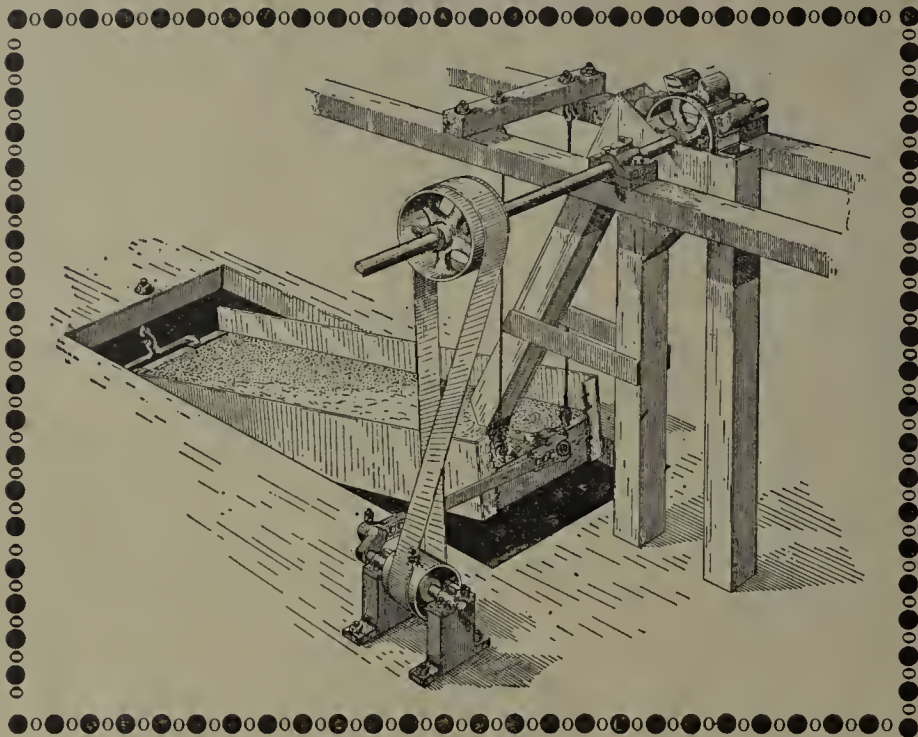
FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,

171 South Clinton Street.

PHILADELPHIA, PA.

A Screen Ordinance



IS DOUBTLESS wise legislation in many places to keep certain persons within the limits of the law; but a screen ordinance to be of benefit to clayworkers should require all those who make brick or other product from shale or fire clay to place between the pulverizer and brick machine a **Richardson Shaking Screen**.

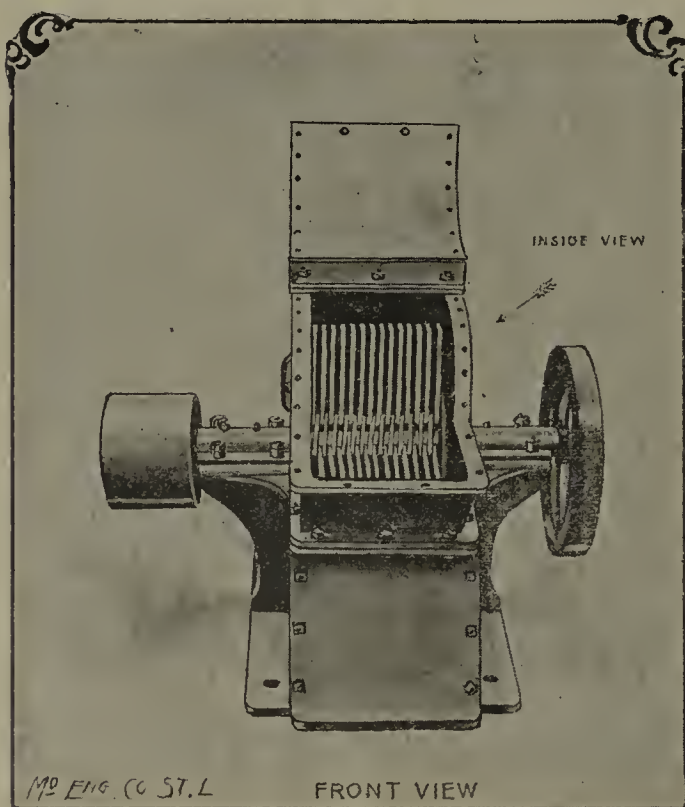
The penalty for not complying with such an ordinance would be self-imposed, namely, a poor product or small output with constant trouble and expense for repairs.

Of Screens there is only one best and we have it. If you want to know more about this send for descriptive circular, and our little book on "Screening Clay."

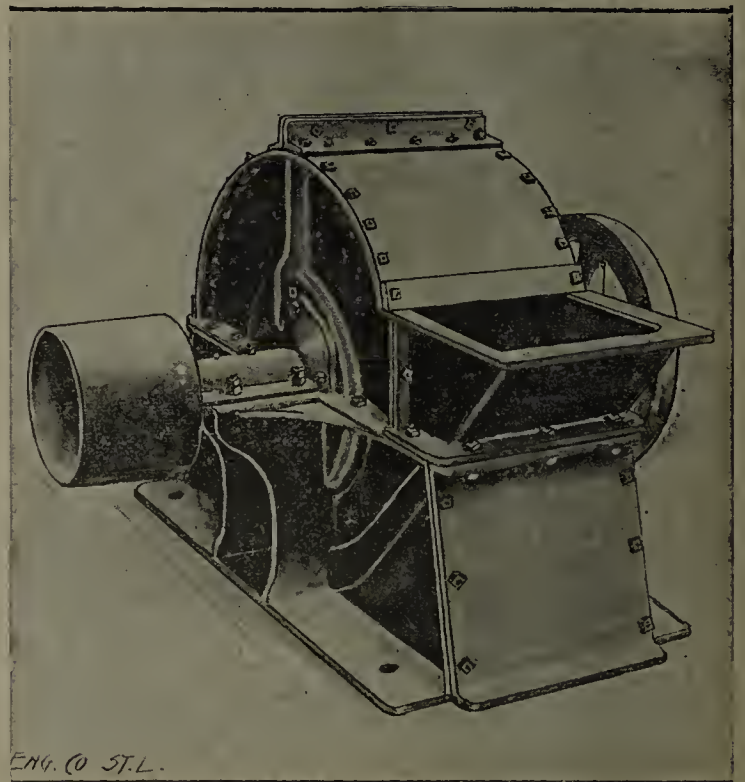
The Ohio Ceramic Engineering Co.,

59-63 Center Street,

CLEVELAND, OHIO.



THESE MACHINES are FULLY GUARANTEED.



NEW IMPROVED PATENT LIGHTNING BREAKER AND PULVERIZER.

These machines are far superior to anything of the kind in the market, being provided with our patent self-oiling dust proof boxes, they can be run at a much higher speed than any other. As the principle of pulverizing is in the momentum, or quick motion of a machine, the advantage can readily be seen. For particulars and prices call on, or address the

SCHOELLHORN-ALBRECHT MACHINE CO.,

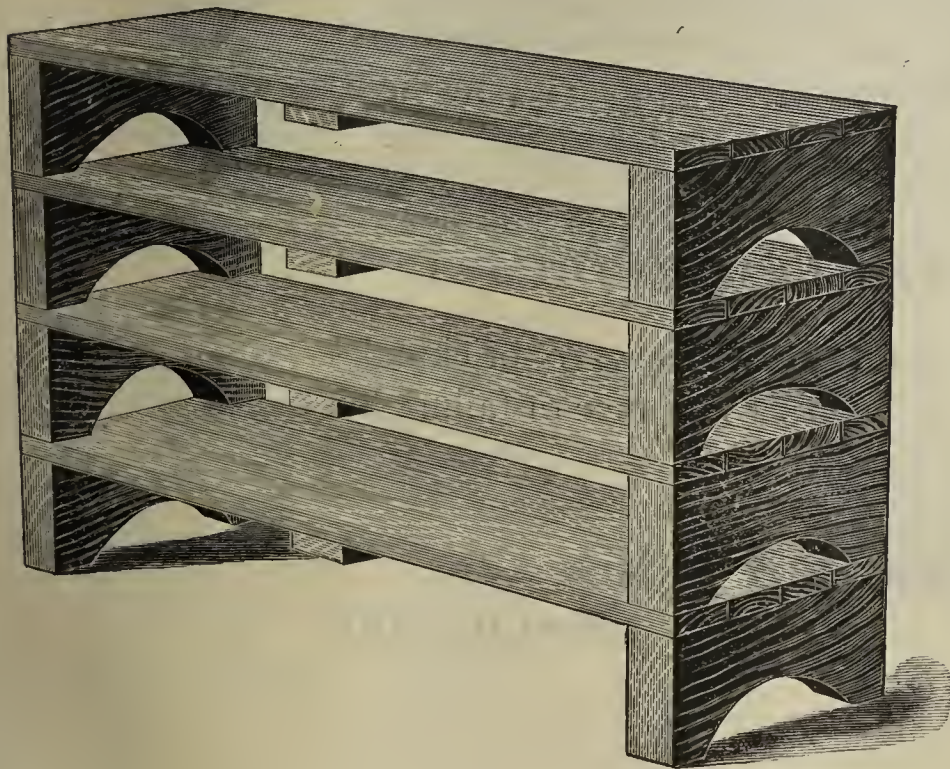
Dealers and Manufacturers of Engines,
Boilers, Machinery and Supplies of
all Description.

609 and 610 North Levee, St. Louis, Mo.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.



IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.

Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., - Saginaw, East Side, Mich.

Buy No Brick Press

And pay for it before having a thorough trial.

Don't Pay for it Then,

Unless you have obtained one kiln or more of high-grade burned brick. Then you have a sure thing.

Where Are You?

If the Brick Press Maker won't guarantee you satisfactory burned brick from your material, don't you think you better find some other press man who will, or else abandon the enterprise? Surely there's danger somewhere, and the press man knows it. If he gets cash or notes for his machine he's safe, but where are you?

We Guarantee Product

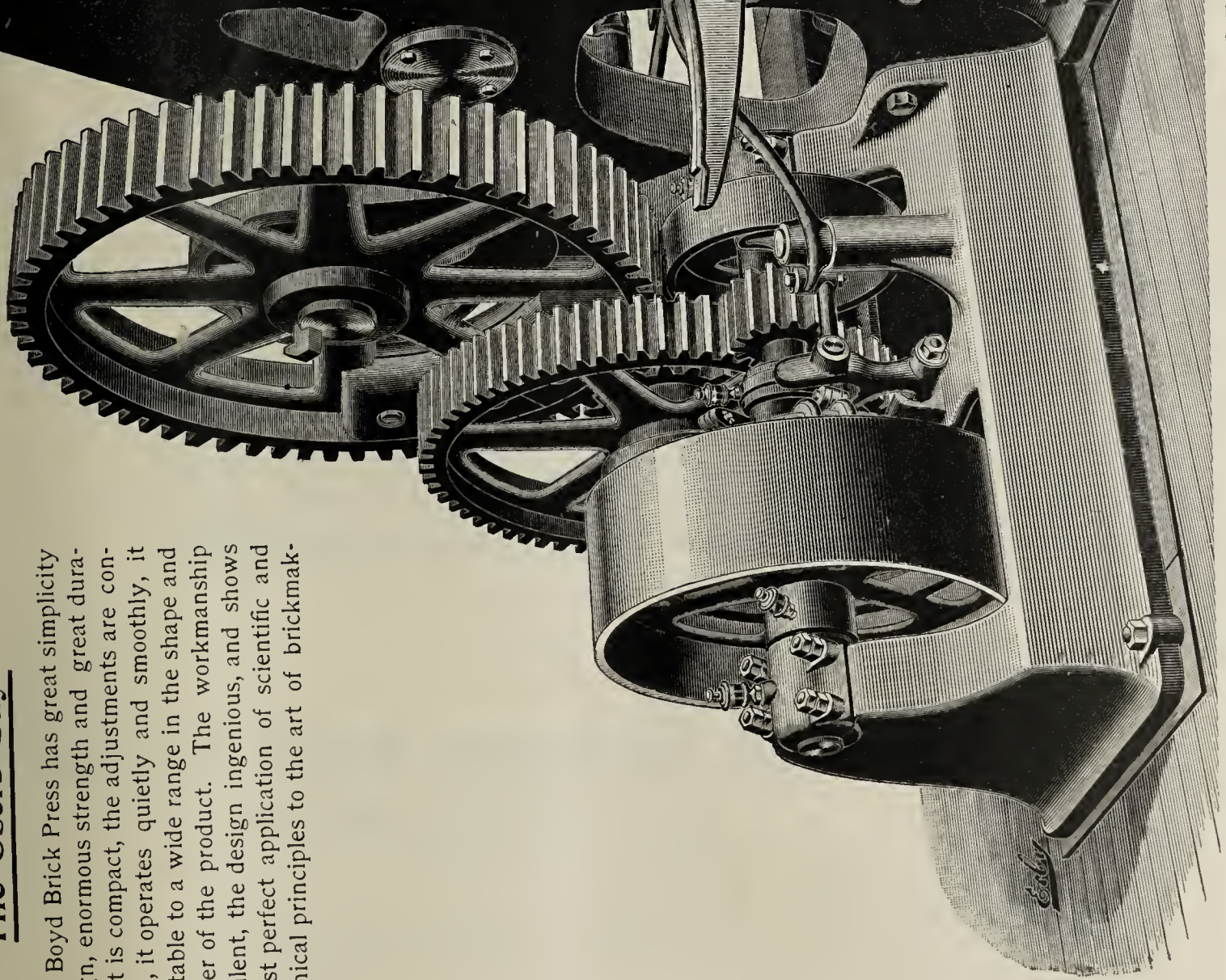
As well as machinery, so brickmakers can avoid all chance of failure by buying of the

Chisholm, Boyd & White Co.,
——CHICAGO.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



Announcement.



THE splendid reputation established for our Brick Press has been due to a determination on our part to have a superior machine; one that would give the utmost satisfaction. How well we have accomplished this is shown by its record. This record and the many eulogiums passed upon it prove that it is the **Standard of the World.**

We are making a new dry press and other new machinery, and are starting a new and extensive machine works in Chicago, where we will manufacture a complete line of Clay Working Machinery of every description.

We thank our many friends for past favors and hope we may secure a continuance of their patronage.

Write us for catalogues and estimates.

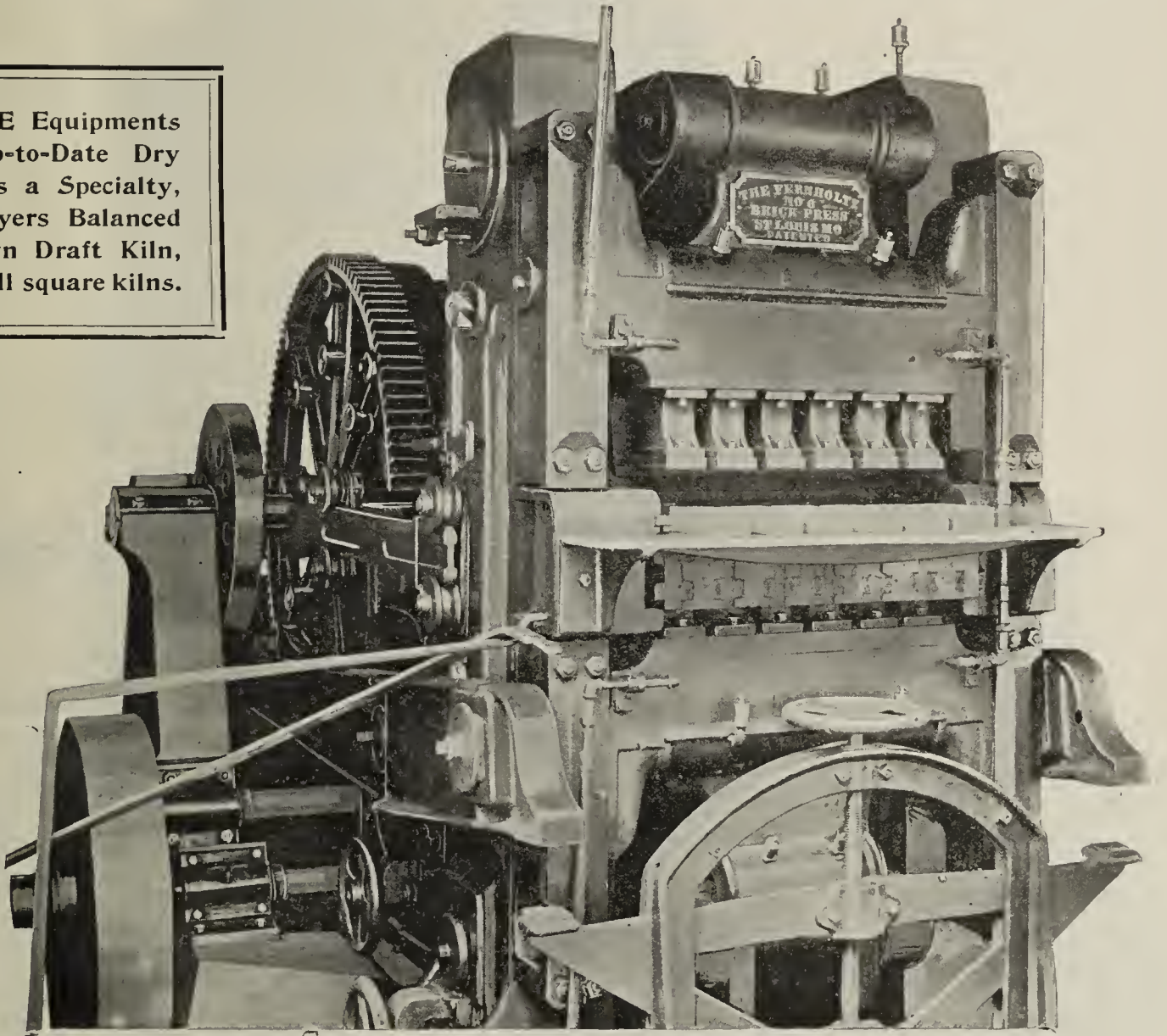
The Simpson Brick Press Co.,
CHICAGO, ILL.

Manufacturers and Contracting Engineers for every branch of Clay Industry.

The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMplete Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

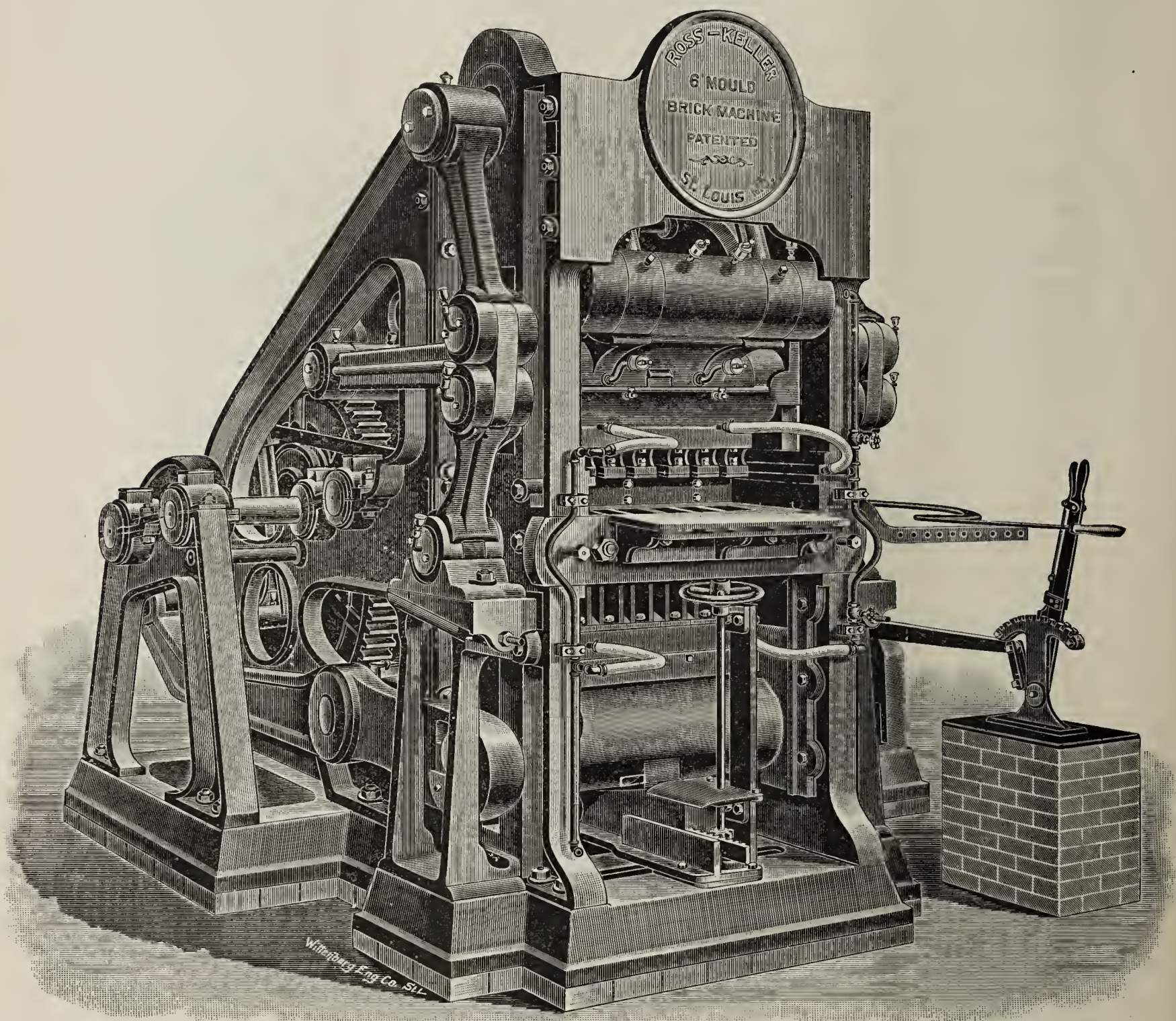
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

ST. LOUIS, MO., U. S. A.

"A Clay Pulverizer of Wonderful Capacity."

SO SAY ALL WHO HAVE USED IT.

Nashville, Tenn., Feb. 27th, 1897.

Messrs. MILTON F. WILLIAMS & CO.,

St. Louis, Mo.,

Gentlemen:--We are in receipt of yours of the 24th, we can justly say that your machine has given us entire satisfaction, grinding hard burned clays.

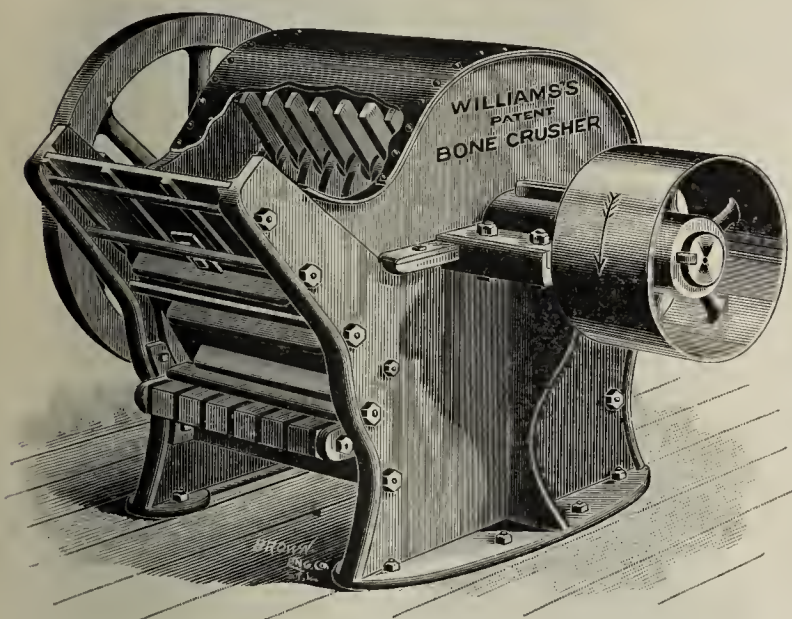
Yours truly,

NASHVILLE POTTERY AND PIPE WORKS,

L. F. Waggoner, Supt.

We can send you many more like this.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER



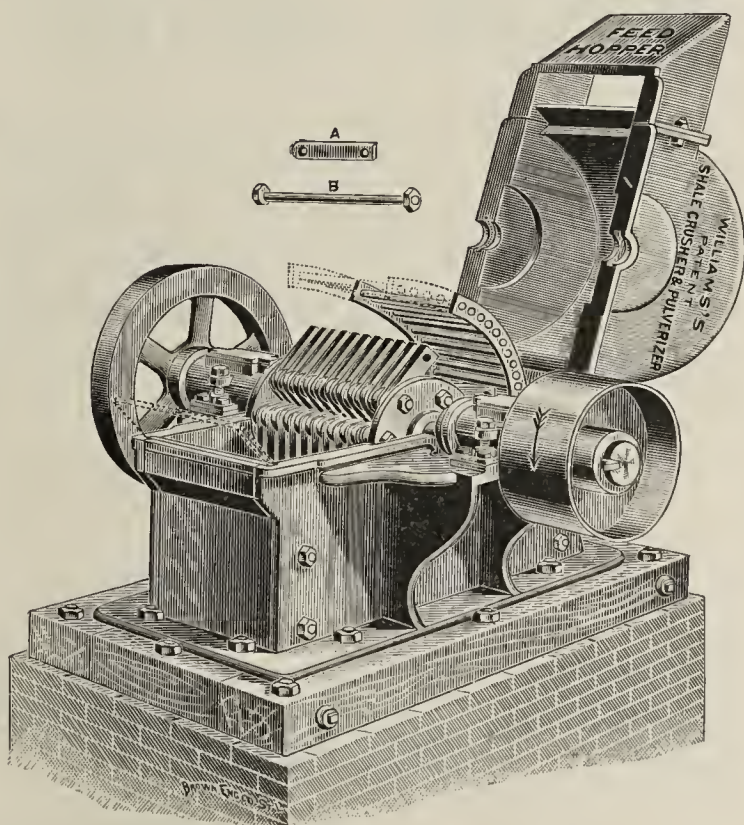
Williams's Shale Breaker.

THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

The Williams Patent Crusher and Pulverizer Co.

2705 North Broadway, - - St. Louis, Mo.



Williams's Shale and Clay Pulverizer.

With Clay Steamer Attached.

Columbia Brick Press.

All working parts are made of Steel.

The pressure is exerted from both top and bottom; consequently there is no lateral strain on the machine.

The pressure is absolutely equal on top and bottom of brick.

A brick with granulation cannot be made on this machine.

The liners on mould can be taken out and replaced in five minutes, without removing any other part of the machine.

Any part of the gearing can be removed without taking machine apart.

The mould box can be taken out in a few minutes, without disturbing the other parts of machine.

The "COLUMBIA" presses clay or shale as dry as a hydraulic press, or so damp as to approximate a stiff mud brick, so that the range of products is from building brick to pavers. No other press does such a variety of work.

The "COLUMBIA" is the only brick press on the market that meets ALL the needs of a brick plant.

For circulars and prices, address

H. B. HILGEMAN,

General Agent "COLUMBIA Brick Press,
... and "COLUMBIA" Mould,

306 Oriel Building, ST. LOUIS, MO.

Terrazo Cement Tiles.

Complete Plants furnished for making the celebrated "TERRAZO" Tiles. Used to the exclusion of all other tiles in all floors, halls, etc., of the following among hundreds of structures in Germany:

JOHANNIS CHURCH, ROYAL AGRICULTURAL COURT, ROYAL DEPARTMENT OF THE INTERIOR, DRESDEN; GERMANIA PALACE, BERLIN AND ANHALT RAILROAD DEPOT, IMPERIAL ART AND MECHANICAL MUSEUM, ROYAL MILITARY ACADEMY, BERLIN; IMPERIAL POST OFFICES, DRESDEN, BERLIN AND
..... LEIPSIG.....

Terrazo Tiles, any color, design or size. For circulars, estimates, etc. Address

H. B. HILGEMAN,

General Agent of THEO. WELGE, for the sale of Dr. BERNHARDI SOHN, G. E. DRAENERT, GERMANY, Machinery and Processes for making TERRAZO CEMENT TILES.

306 Oriel Building, ST. LOUIS, MO.

THE ANDRUS DOUBLE PRESSURE 4-MOLD BRICK PRESS.

Produces the finest pressed brick from dry or semi-dry clay at less cost than common brick by any other process. This press is the **Simplest** and the **Strongest** press on the market, and has given **universal satisfaction** to purchasers. We guarantee it against breakage for **5 years**.

Send for descriptive catalogue.

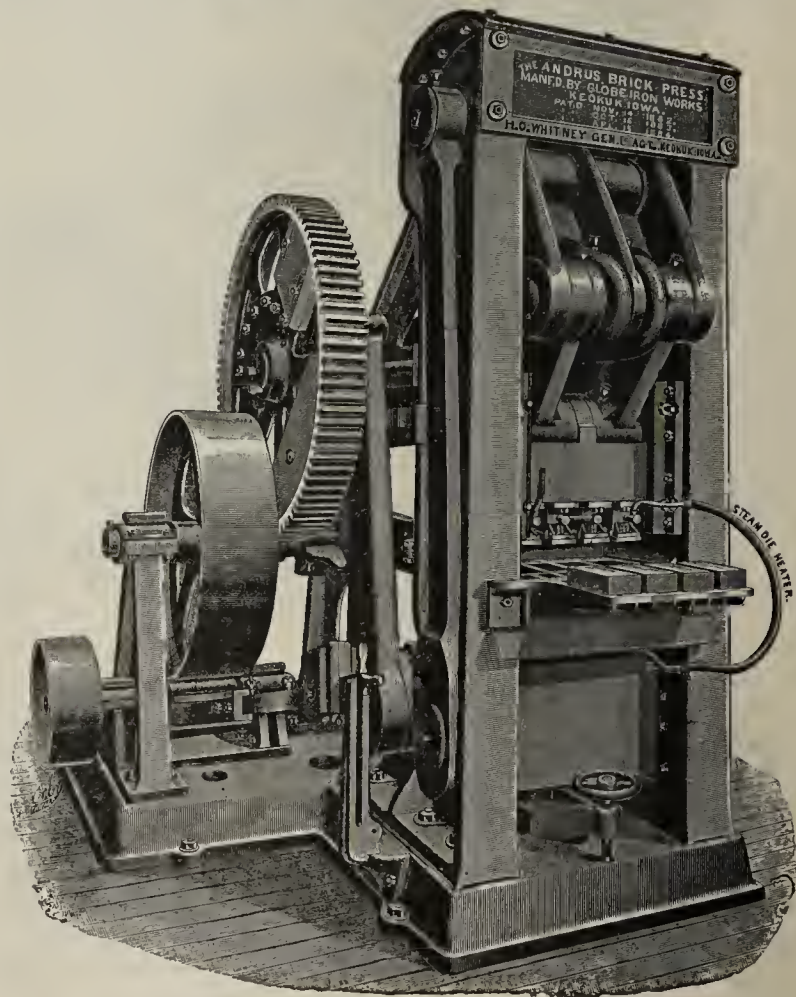
Address, _____

H. O. Whitney,

General Agent,

GEN. OFFICE AND
FACTORY.....
KEOKUK, IOWA.

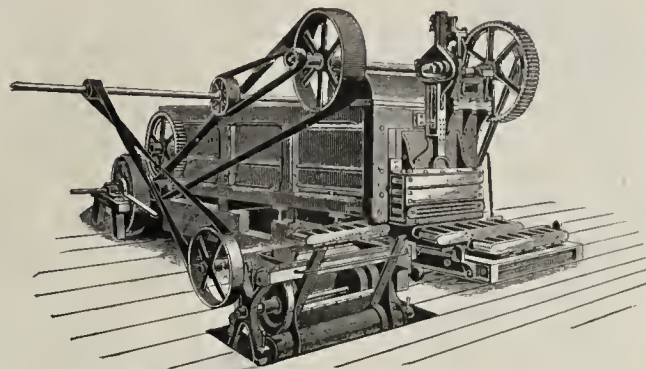
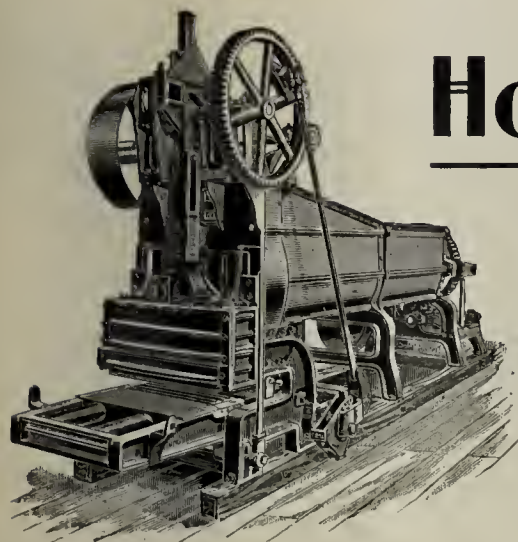
KEOKUK, IOWA.



We Have Anything You Want.

.....

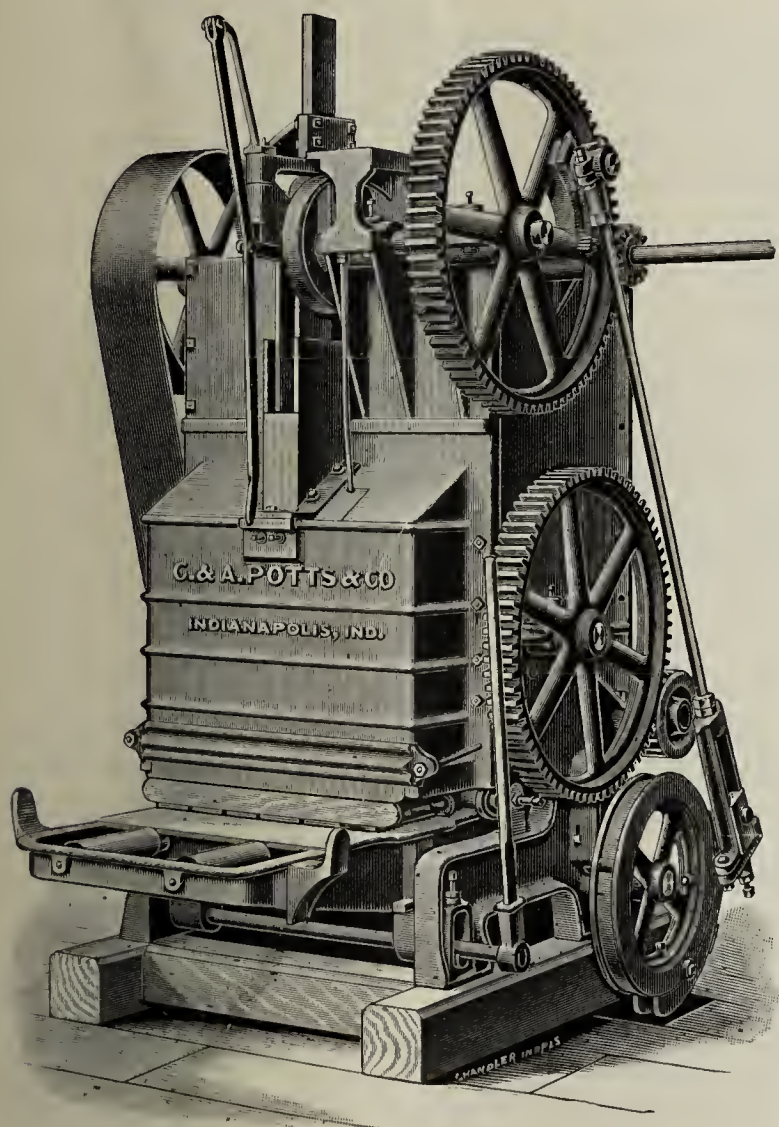
Horizontal Stock



Brick Machines,

EITHER ALL IRON OR WOOD PUG MILLS.

The largest, heaviest and strongest Brick Machines made. We defy competitors to show as well and strongly built machinery. They have no equal for Quality and Quantity.

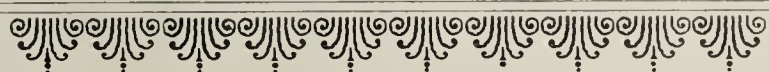


Our New ...

VERTICAL MACHINE

Is entirely different from all others of this class. The press is entirely inside of machine, it has no Vertical shaft is positive in filling the press box and moulds.

WE NEVER FOLLOW,
BUT ALWAYS LEAD.



Write for full Particulars to

C. & A. POTTS & CO., 420 W. Washington St. **INDIANAPOLIS, IND.**



BRICK DRIER

Or any article, for that matter, that has no quality other than its cheapness to recommend it, is a pretty good thing to leave alone.

The STANDARD IMPROVED BRICK AND TILE DRIER

does not belong to this class; it has real, genuine merit; it is appreciated for its intrinsic worth; it is acknowledged to be the criterion by which the excellence of all others is judged—hence the expression frequently heard, "Just as good as the STANDARD."

In buying anything, whether a Drier, a railroad or a mule, it is the part of wisdom to consider QUALITY and RESULTS, AS WELL AS PRICE.

On THIS, the TRUE basis of comparison, WE DEFY COMPETITION.

The testimonial letter given below is offered as evidence of the high esteem in which the STANDARD DRIER is held



OFFICE OF THE SUMMERVILLE BRICK WORKS.

The Standard Dry Kiln Co., Indianapolis, Ind.

Summerville, S. C., December 8, 1896.

Gentlemen—It affords me great pleasure to have the privilege of testifying to the merits of your eight track Drier erected at my works in place of the _____ Drier, which was destroyed by fire last April.

In contracting with you for this Drier I was very particular in making you guarantee to dry 40,000 brick per twenty-four hours. After giving it six months' trial, I have concluded that you could have safely guaranteed 50,000.

Your Heating Apparatus I consider perfect. It is easily kept in order—in fact, I have done nothing to it since its installation. It does its work effectually, drying the output of my Chambers Machine, 40,000 per day, without being forced in the least. I cheerfully recommend your Drier to any one wanting the best and most economical one on the market.

Wishing you much success, I remain,

Very truly,

A. W. TAYLOR, Propr.

OUR NEW CATALOGUE No. 35

Contains a great many indorsements fully as emphatic as the above. A perusal of them will satisfy you, we believe, that every claim made for the STANDARD DRIER is verified by actual work. It also illustrates and describes our Equipment, including our new Steam-Saving Appliance, you will find it profitable reading. If we knew your address, we would send you a copy.

The Standard Dry Kiln Co., 186 South Meridian St.,
INDIANAPOLIS, IND.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA

VOL. XXVII

INDIANAPOLIS, IND., MAY, 1897.

No. 5.

Written for the CLAY-WORKER.

THE SOFT MUD PROCESS.

THERE HAS BEEN a great deal of discussion of late about the old soft mud brick as well as the stiff mud and dry press brick. Although I am making by the stiff mud process, or wire cut, yet I do not think our forefathers were making an inferior article when they put on the market the old soft mud brick. We can see to day in old buildings hand-made brick that have stood the storms of over two centuries, and seem to be as strong and hard as the day they were laid. Soft mud brick meet nearly every requirement known to the trade. They can be repressed in any shape desired for ornamental work. Again, they will stand fire as well as any other machine-made brick and better than some. Brick made by any process can be called an inferior article if the process is not carried out practically. First, the clay must be well prepared for the machine. You cannot make soft mud brick out of dry clay and lumps, nor can you make stiff mud brick from sloppy clay. The machinery should be kept in good repair if you expect good results. Then, when you get good, square, smooth brick from the machine, they should be handled carefully from the machine to drier or racks and to the kiln. If you get them this far in good shape, with perfect corners and edges, then the setter and burner is responsible for their finished appearance. The greatest pains should be taken

to have them properly set and burned. There is such a great difference in clays that you must study the nature of the clay to know just what method will give the best results. Then, when you find it, stick to it, and don't follow every method you hear of or read about, for good results in one clay mean a failure in another by the same method. This can be applied to the drying also. You must have your clay tested in different driers before putting in one. I have clay that will not stand drying in the sun or wind, where they are hacked six high, without checking very badly. They must be covered the first day, if hacked in the sun, until they stiffen up. I put in a hot floor drier, and found they would check very bad in drying unless they were dried very slow. I have worked other clay that could be dried in fifteen hours, bone dry, without a check. So I say the clay must be put to a thorough test to know just how to get the best results.

I have in my possession a brick taken from Old Ben's Church, in Isle of Wight county, Virginia, that had been in that building for about 265 years, and is in a good state of preservation. It is an English hand-made brick, and they knew how to grind clay and dry it at that time as well as burn it. All the brick in this building are said to be English brick. This is the second oldest church in Virginia, and was built in 1632. If it is left to the strength of the old brick



OLD BEN'S CHURCH.

as to how long they will stand, they will say there is no end to their strength. The accompanying poem was written by W. R.

Jacobs, and is given with his consent. This picture was taken while the church was in its old, dilapidated condition, about three years ago. Since that time it has been repaired, rededicated, and is now used as a house of worship again.

H. L. JACOBS.

Old Ben's Church.

Oh, hallowed walls of olden days,
And specimen of strength that stays—
The mighty hand of sweeping Time—
That stands in majesty sublime!
We read the past, the future see
Of Christianity in thee.
Thy tow'r, erected as a rock,
Hath stood the tempest and the shock
Of sin that crossed th' expanse of sea
And wilted by the door of thee.
We hear the anthems of thy choir
Re-echo from each rising spire
And float across the distant States
To California's Golden Gates.

Now in the wood of Isle of Wight
The whip-poor-will reclaims the night,
And all is dark by casement old,
Where dazzling lights once shone as gold.
The name of many a one is writ
On massive arch, 'neath which I sit
And wonder at the masonry
Done in the country's infancy;
Some writ or carved by hands that rest
Beneath the walnut's verdured breast,
For in the churchyard, strewn about,
Are shatter'd slabs, with names worn out.

Two hundred years and fifty-eight
Have drifted by thee up to date,
And left the marks of many a storm
Upon thy quaint, exotic form.
Then rest, O rest! thou aged walls,
Whilst dreiful memory recalls
Virginia's second church, which sent
The gospel o'er the continent.
Thy work is done; thy rector sleeps
Where th' canopy of heaven weeps
Its shower of dew on starry night
Down on the fields of Isle of Wight.
—W. R. J., in Norfolk Virginian.

Written for the CLAY-WORKER.

IN DEUTSCHLAND. No. 13.

Glaze Mixtures—How They are Made.



THE NEXT STEP TO BE CONSIDERED in the glazing process of earthenware is the preparation of the glaze mixtures. This part is an important one, for however well made the ware may be otherwise, if the glaze is poor the articles have no commercial value. The ingredients, either raw or fused—fritted—are reduced through a twenty-mesh sieve and weighed. After this has been done the mixture is ready for the glaze mill. Various types of grinding machinery are used, but the one most commonly found is the old-fashioned stone mill. This piece of apparatus closely resembles the old flour mill, but is much smaller in size, about two and one-half or three feet in diameter. The top stone, like the regular mill-stones, has a center opening, with an iron spider, the latter being supported by a movable pivot rod extending up from the bottom stone. At the bottom of the mill the rod is connected with a wedge in such a manner that loosening or tightening the latter lowers or raises the top stone, thus regulating the fineness of grinding. The top stone alone revolves. The bottom stone is imbedded in plaster paris, which comes flush with the upper surface of the stone, and, being slightly depressed, forms a kind of trough around the circumference. A wooden wall, about level with the upper surface of the top stone, in-

closes the mill, leaving a passage between itself and the stones, with the plaster bed as a bottom. An opening is left in this rim for the discharge of the ground glaze. The glaze ingredients, mixed up in water, are fed into the mill at the center hole. Obeying the centrifugal force, the particles are propelled towards the circumference, but, of course, are subject to the grinding action of the stones, till at last they escape into the passage, finely ground, as a cream-like liquid. In the passage the glaze is collected and runs off through the discharge opening into a tub. Motion is given to the top stone by a very simple contrivance—a wooden pole, about eight feet high, fastened to the stone at one end and to the ceiling, by means of a swivel hook, at the other end. Turning the stone by means of this arrangement involves quite a severe kind of manual labor, which the journeymen shun and the apprentices dread. Not only glazes, but also colors and slips, are ground in this manner. Wherever power can be had to drive the mills their capacity is, of course, greatly increased. The ball mills are coming more and more into use in the better equipped shops, for not only do they show a greater efficiency, but they are also much simpler and less liable to get out of order. Their use always requires power which most of the ordinary potters do not possess.

—The Process of Glazing.—

The manipulation of glazing is about the same which has been described under slipping, but owing to the high specific gravity of the lead oxides the cream-like liquid must be kept stirred up. Before applying the glaze it is necessary that the ware should be thoroughly brushed free from dust, which is liable to cause pinholes. Likewise, oil or grease spots should not cover any of the surface to be glazed. Sometimes it happens that the lead oxide, on account of its scaly structure, loosens the coating of glaze from the surface and causes it to fall off. This is prevented by adding dextrine to the mixture. Neglected places are brushed over; the bottom, which is to be kept free from glaze, is sponged. There is no question but that the constant contact with raw lead glazes is highly injurious to the health of the workmen, and this is only avoided where fritted compositions are used.

Several hours after being glazed the ware may be set into the kiln, provided, of course, that the body itself be dry enough. The ordinary earthenware kiln is unlike any kilns used in the United States. It is almost rectangular, though somewhat narrower at the back end than at the front. The size of such a kiln varies from twelve to twenty feet, inside length, and from six to eight feet, inside width. The arch may be almost any curvature, but frequently it is of the pointed type; the draft is horizontal, the floor solid. The fire holes are arranged at the wide end of the kiln, while the exit flue is at the other one, level with the floor. The furnaces are separated from the kiln space proper by a screen-like perforated wall, whose office it is to distribute the flames and to prevent, at least to some extent, the ashes from being carried between the ware. The pottery and other earthenware is set into the kiln without being protected, excepting the front rows, which are shielded from the direct flash of the fire by tiles or brick set up loosely around them. Owing to the horizontal draft, the ware is set very loose at the bottom and close at the top, in order to produce a somewhat even draft. A uniform burn, however, is almost an impossibility in these kilns. Wood is preferred by the potters for fuel, and where it is too high to be used exclusively it is employed in the first and last stages of the burn, coal being used for getting up the heat. In the last stage, when the glaze is about ready to melt, a rapid wood fire is continued for some time, till the glaze fuses, as indicated by the trial pieces. At this point the burning is stopped immediately and the kiln is closed.

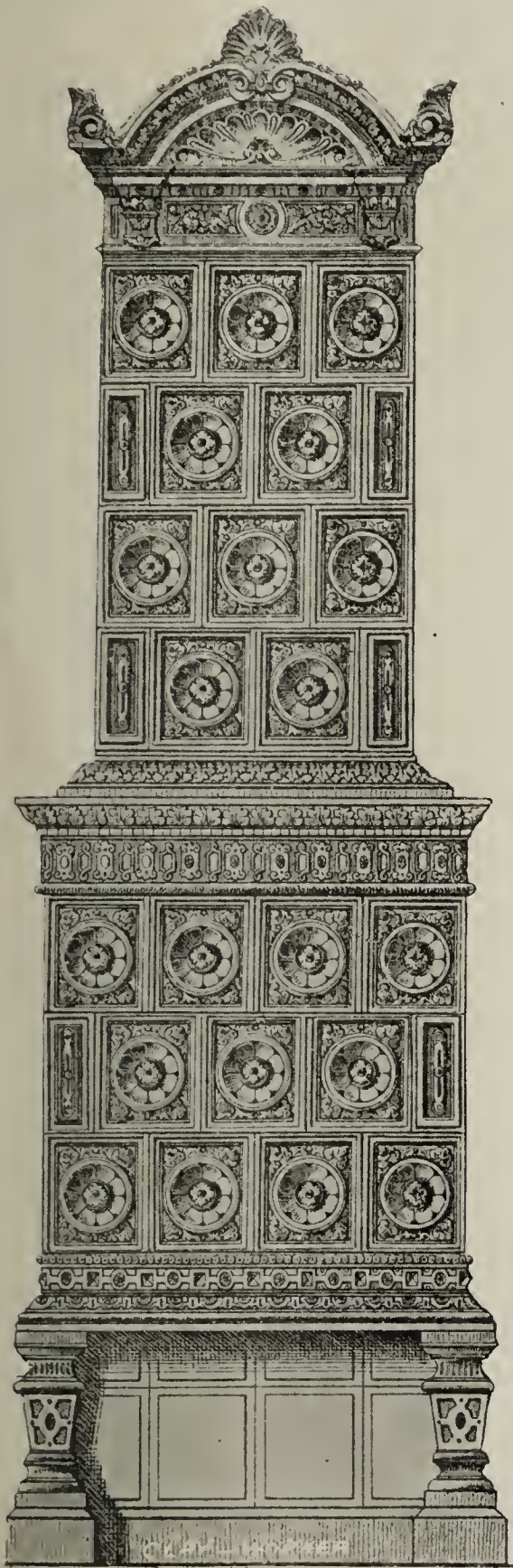
Up-draft and down-draft kilns are employed to some extent, and as a rule give better satisfaction than the horizontal type,

in which the great trouble is the tendency to burn the ware too soft at the bottom.

As we have already said, the earthenware industry has seen its best days, and were it not for other work, such as the making of stove tiles and building stoves, many potters could not make a living in following their ancient trade.

—German Clay Stoves,—

When first arrived at Bremen from the sea the writer was

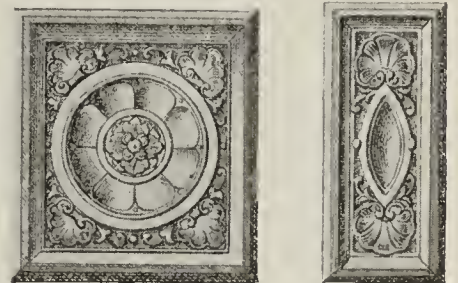


GERMAN HEATING STOVE.

accompanied by a young man who had never been in Germany and who manifested the proper American curiosity in regard to people and things. At the hotel he saw for the first time one of the monument-like white glazed clay tile stoves, which actually impressed him for some time, but which he finally, somewhat irrelevantly, compared with a tombstone. To describe a

German heating stove is not a very simple matter. Briefly, it is a tall, rectangular structure, averaging about seven and one-half feet in height, built up of clay tiles. These are tiles of greatly varying dimensions, consisting of the tile itself and a back projection, made out of thin side walls, at right angles to the tile plate. This back part is walled up. The shape may be compared with a box open at one side. In building up the stove the hollow spaces of the tiles are filled up with sandy clay. The walls of the tiles are provided with holes so that strong wires can be drawn through them, in this manner binding the whole together. The wires being imbedded in clay, there is no danger of their burning out. The fire and ash doors are constructed in the ordinary manner, the grates being flat bars. On the same side with the fire door there are usually two sheet-iron boxes, open at both ends, walled in about three and four feet from the top, respectively. These offer additional heating surface, and are also used as receptacles for vessels, etc., to be heated. In these stoves it is endeavored to utilize the heat of the fire gases to the greatest degree, and for this reason the combustion gas is made to travel in zigzag fashion around alternate fire clay slabs throughout the entire space, till it escapes at the top, with most of the heat imparted to the clay walls. The tile stoves are slow to heat up, but when once warm only a comparatively small fire is required to keep up the desired temperature. The tiles are always glazed and can be had in all imaginable colors. The plain heating stoves of northern Germany are the regulation white, while in middle and southern Germany colored majolica glazes seem to have the preference. Often, where the tiles are decorated in a harmonious manner, the whole presents a very agreeable appearance. Of late years the iron stoves have made themselves very prominent, and have made sad inroads in the ranks of the clay stoves, but in many districts the latter are still the favorites, plain and unassuming in

the homes of the poor, richly decorated in the houses of the wealthy. Much has been said pro and con about tile stoves, and we cannot go into the discussion of their respective merits and defects, but the main points in their favor are that they are more economical in the consumption



GERMAN STOVE TILES.

of fuel; that they distribute an even heat, retaining it longer, and that their appearance is more ornamental than that of the iron stoves. On the other hand, the iron stoves can be readily moved, while the others are necessarily fixed parts of a house, heat more quickly and are cheaper. The large extent of the use of tile stoves requires a large industry to supply its demand. Besides the large number of earthenware potters engaged in this work, numerous factories manufacture stove tiles on a large scale, supplying them to regular stove builders. In this class of goods the glaze plays the most important part; in fact, it determines the grade of the ware so that we may classify the tiles according to the kind of glaze applied. There are two classes of distinct glazes employed; the one is a lead glaze, colorless or colored, the other an opaque glaze, white or colored. The latter is an enamel in the true sense of the word, a lead glaze in which tin oxide is used for producing opacity. Both kinds are fused at a comparatively low heat. The lead glazed tiles are said to belong to the great group of majolica ware, the enameled to the faience, so that really these high-sounding terms are simply determined by the glazes, whether the products belong to the highest order of the ceramic industry or whether they are used for the humblest purposes. We in this country are apt to consider both appellations as being properly applied only to art pottery. It is obvious that the glazes determine the kind of body required,

For majolica tiles almost any clay is suited, provided it is free from concretionary matter and burns comparatively hard at the low temperature of the glaze kiln. But for faience tiles only a calcareous material can be used, containing from 8 to 16 per cent. of lime. If the tin enamel is applied to a clay free from lime, cracks, dullness, blotching and other blemishes are certain to occur. Bernard Palissy, the great French potter of the middle ages, in trying to produce a faience glaze on a body free from lime, experienced the great difficulties of which we read in his biography, and only after a long period of patient experimenting did he succeed in making a somewhat satisfactory enamel, although he never succeeded in entirely overcoming the difficulty, his success being due mainly to the striking style of decorating the ware.

In endeavoring to describe the manufacture of stove tiles the writer intends to point out the fact that the methods employed in this branch are applicable also to other forms of glazed ware used for interior decoration. We had occasion to see several prominent stove tile works. At one time we enjoyed a visit with the tile works at Hennigsdorf, in the company of Mr. Fred Cramer, the genial brother of Mr. E. Cramer, owner of the well-known Seger & Cramer laboratory.

The factory, located at the clean little town of Hennigsdorf, near Berlin, comprises two departments, the one manufacturing majolica tiles, the other faience. The clay used is calcareous, and burns buff. It is washed at the bank, which is situated a considerable distance, several miles from the factory, in an ordinary claywashing machine, driven by steam power. Before escaping from the washer the slip is made to pass through a sieve. The discharged liquid is collected in a well, and is pumped to the factory through a pipe line by a powerful duplex pump. At the works the slip is emptied into evaporating basins, where chalk is added to the portion which is to be used for faience tiles. The stiffened clay is wheeled to the preparing rooms, where it is mixed with grog and thoroughly pugged, after which it is stored for some time. When at last ready for the pressing room, it is molded there into tiles, either by hand or machinery, by hand in plaster molds, when the ornaments are executed in relief, by machinery when the patterns are plain, such as the plain tiles and cornices. The machines used are piston presses. Continuous cornices are pressed in columns and cut off according to the length wanted. The tiles are made in a different way. Before starting the press a movable die, similar to the socket die of a sewer pipe press, is clamped to the mouth of the press cylinder. The piston then advances, filling the movable die and pressing the tile plate. As soon as this is done the die is unclamped and pushed aside. There is a second die within the mouth of the cylinder, similar to a hollow block die, which molds the backing of the tile. Thus the pressing is continued, and a short piece of a column, corresponding to the cross-section of the back part, issues from the inner die. The complete stove tile is now cut off and removed. The operation takes place quite rapidly. All the different shapes are put on racks to dry very slowly, for quick drying would warp them too much. When "leather hard" the tiles are straightened with iron rulers, and at the same time smoothed.

In this factory the tiles are not glazed green, but are first biscuit burned and ground. They receive a very soft burn, being heated only a little over the temperature at which the combined water is driven off.

Pieces of clay like the stove tiles are certain to warp to some extent in the first stage of the burning, rendering them unfit for exact work. Hence grinding is resorted to in order to remedy this defect, so that the tiles are true when they go into the glaze kiln. The grinding takes place on a machine whose main part is a cast-iron disk about three feet in diameter. In the grinding operation the tiles are placed in iron clamps, of which there are eight, and which are large enough to clamp the back part of the tiles so that the surface rests on the disk. These boxes are held stationary, but loosely, by pins fastened to cross pieces above the wheel. These pins do not prevent

the boxes from rotating so that the tiles are ground evenly. A stream of water and sand is continuously running on to the disk. After the machine has started, tiles are clamped into the eight boxes, one after the other, and by the time the eighth tile has been put in the first one is ground.

The manipulation of glazing consists simply of pouring the liquid over the surface of the tile, taking care to do it in one sweep. The corners are, of course, carefully sponged to remove all superfluous glaze. All the rooms connected with the preparation of the glazes and enamels are scrupulously clean, and, excepting some porcelain works, we had no occasion to see better equipped laboratories. In connection with the glaze department is a well arranged set of frit furnaces.

All the burning is done in a continuous kiln, the green tiles being set without protection from the flame, while the tiles to be glazed are put into muffle chambers and seggars.

Much attention is paid at this factory to art tiles, for which the concern has established a widespread reputation. Truly beautiful are the many different tints and shades, and especially the delicate colors of the faience ware. There are a number of such factories in the vicinity of Berlin. One place—Velten—especially, is famous for its prominent industries of this kind. The Velten clay is excellently suited to the manufacture of faience.

The preparation of these tin enamels is very interesting. They must always be fritted, this being accomplished in seggars set in the kiln, along with the ware, or in separate furnaces, with regular glass pots or crucibles. These frit furnaces may be run continuously for some days, when enough composition is melted to supply the factory for months. In the latter case the crucibles must be provided with a small opening in the bottom, which at first is closed up with moist sand. As soon as the first charge is melted, it runs out and empties into a vat filled with water. Immediately the crucible is refilled and the process goes on. The glass is then ground up, wet, to a very fine slip and used for glazing. Ball mills, with porcelain lining and flint balls, are worked in nearly all modern stove tile factories.

The tin oxide is often made by the tilemakers themselves by heating metallic tin in large cast-iron pans. The common way to do is to obtain the lead oxide at the same time by oxidizing both tin and lead together. The two oxides obtained are thus intimately mixed and enter into the composition under the name of tin ash. The pan, which must be connected with a well-drawing chimney, is charged with about 250 or 300 pounds of the metals, and heat is applied by a furnace beneath the pan, causing the alloy to melt. Gradually the mass, by constant stirring, becomes oxidized, and is converted into a grayish powder, which is sieved and added to the composition to be fritted. Although, of course, tin ash is sold on the market, the tilemakers prefer to be certain of having pure ash, because it is the essential component of the glaze, which must be free from all impurities in order to produce the beautiful white enamel. In like manner, all other ingredients are scrutinized and tested for iron and other coloring matter which might injure the color. Special care is taken to have the sand as fine and pure as possible, as it is more likely to contain iron than any of the other substances. Of late years boracic acid, usually as borax, is being used quite extensively in enamels, as it increases the hardness and decreases the co-efficient of expansion. The majolica glazes are not fritted unless they contain soluble alkalis or boracic acid. Their preparation is less troublesome than that of the enamels.

In order to show the relative composition of the two types of glazes so generally applied in the ceramic industry of Germany, two compositions, representing each kind, are quoted, the first one being a blue majolica glaze, according to Salvétat, the second one a white faience enamel, according to Grote (*Thonindustrie-Zeitung*, 1878):

I.

Quartz sand, 1,000 parts (by weight); oxide of lead, 2,000

parts; chalk, 250 parts; boracic acid, 700 parts; cobalt oxide, 40 parts.

11.

Tin ash, 116 parts (by weight); borax, 20 parts; chalk, 10 parts; quartz sand, 84 parts; salt, 10 parts. (Tin ash being composed of 29 parts of tin and 71 parts of lead.)

It is an interesting fact that the Eastern enamels for brick which are so frequently found on buildings of Persia and Arabia are, as a rule, true tin enamels, and there are many examples where they have stood the wear of many centuries without having lost their beauty. In our Northern climate, however, such enamels could be used only for inside work.

THE NATIONAL ASSOCIATION OF STOVE-LINING BRICK MAKERS.



SPRING QUARTERLY MEETING of the National Association of Stove-lining-brick Makers was held at the Broadway Central Hotel, New York, Thursday, April 15, 1897.

There was a good attendance of the active members, and the business was conducted with such perfect accord and agreement as to give universal satisfaction to all connected with the trade.

The officers of this Association are all well tried and thoroughly experienced men, who have, by long and discretionary service, proven their faithfulness and their ability to carefully protect and promote the general welfare of this department of the clayworking industry.

At the opening session the following gentlemen were present when the President took his chair:

S. D. Horton, President, Peekskill, N. Y.; Benjamin Fox, Vice President, Reading, Pa.; John S. Williams, Treasurer, Taunton, Mass.; B. C. Pierce, Secretary, Taunton, Mass.; Harvey S. McLeod, ex-President, Troy, N. Y.; Bradford French, Taunton, Mass.; Frederick Parker, Taunton, Mass.; H. A. Perkins, Stamford, Conn.; Wm. Latshaw, Royer's Ford, Pa.; Mr. Helman, Buffalo, N. Y.; Wm. Maybie, Peekskill, N. Y.; Charles A. Bloomfield, Metuchen, N. J.; James Taylor, Port Monmouth, N. J.

The meeting of the first session was called to order at noon, sharp, by the President, S. D. Horton, and at once proceeded to the reading of reports by the several officers. These reports were found very satisfactory, and indicated that the condition of the trade was as good as could be expected, when the general state of business is fairly considered. There were, indeed, some changes caused by the new developments in heating and cooking appliances, which did not require fire brick, but these were fully offset by increase in other lines, so that, while they might have liked a little more, they were glad and content that the business outlook was as good as it was. One fact was very clearly demonstrated, viz.: that the friendly co-operation and the mutual regard for the welfare of each other cultivated by the good-fellowship within their Association was a great benefit to the trade, and of financial helpfulness. There had been no discord nor any withdrawals, so that the Association is stronger to-day than ever before.

The second session met in the banquet room of the hotel. The matters for consideration and discussion were presented by Steward Horricks, assisted, as usual, by Assistant Steward Charles A. Bloomfield. It consisted of a generous feast, such as clayworkers admire, served in profusion, amid beautiful flowers and other luxuries.

At this session another phase of the brickmaker's skill was made manifest. They could eat and drink and talk. It soon became so genial and conversational a party that it was clear that, though some of them might be Odd Fellows, they were all of them "good fellows." Nor were the absentees forgotten.

The President, S. D. Horton (who is a very prominent citizen of Peekskill, N. Y., having been Mayor, or Primate, of that

village, also Sheriff of the county, and who is at present the President of the Board of Trade), was compelled to leave before the banquet was over to attend to some one of his public duties. His place was therefore taken by Vice President Benjamin Fox, who directed the concluding portion of the feast and presided over the later session.

The third session was entirely of a social character, and was devoted to a general consideration of such topics as were of interest to the Association. One subject which received a large share of the attention of the meeting was the Clay-Worker's report of the Buffalo Convention of the N. B. M. A., published in the February issue. Every one present took a deep interest in the subject, each one speaking of some particular item which had attracted his attention.

It was suggested that the stove lining men should add to the interest of their meetings by selecting some one practical question in advance to be considered at each meeting, and to notify the members so that they might come prepared to discuss it, and thus help each other, thus adding to the present



S. D. HORTON, President National Association Stove-Lining Brick Makers.

popular meetings an advantage of practical instruction. Some members proposed that they should join the N. B. M. A., and it is probable that many will do so during the ensuing year.

An attempt was made to obtain some new subscribers for the Clay-Worker, but it was found that all were already old subscribers, and, best of all, they read it too. All were unanimous in their praise of the good work done by that journal, and declared it to be a valuable help to all who were interested in brickmaking or pottery.

Upon a call from the Chair, Mr. Charles A. Bloomfield made an address, urging upon the Stove Lining Association the advantages of connection with the aims and objects of the N. B. M. A. He called especial attention to the recent work at its last Convention at Buffalo in passing and providing for the Richardson resolutions, proposing to endow a scholarship in the ceramic class at the Ohio State University, at Columbus, O. His remarks met with general approval and were discussed and appreciated.

The meeting then requested James Taylor to give them some

words of interest. He took up the same theme, explaining more fully the objects of the scholarship, saying that his experience had led him to the conclusion that the best thing a man could do to fortify himself in his business and to make his calling popular, was to give freely to his fellow-workers the advantage of his labor and experiences. Every true workman is helped by the competition of other skilled workers, and the more they learn the more can he attain. He expressed a hope that at some not far distant day the State of New Jersey, for its potters, and the State of New York, for its brick and terra cotta makers, would establish schools for the study of ceramics, and thus lead to the highest development of the vast deposits of clay and shale within their borders.

Mr. Chas. M. Helmer was then called for, and he spoke for his city of Buffalo in its relations to the late Convention of the N. B. M. A. It is not necessary to detail his story, although it was a good one, for no man, not excepting a real live Buffalonian like Mr. Helmer, can begin to tell the broad and kind and persistent hospitality of the Bisons. We have no standard or unit wherewith to gauge or measure the great treat that was conceived and prepared and given to the brickmakers of America, last February, by the city and builders and brickmakers of Buffalo, under the presidency of the energetic and omnipresent Brush and his generous co-workers.

After some general conversation upon other matters of present and future interest, the meeting adjourned to meet again, subject to the call of the Secretary. JAMES TAYLOR.

Written for the CLAY-WORKER.

THE CLAYWORKING INDUSTRIES OF VICTORIA, AUSTRALIA. No. 3.

BY F. A. CAMPBELL, C. E.



TO COMMENCE at the beginning of the subject in orthodox fashion, I should, in my first paper, have dealt with the brick clays, their composition, and so on. I thought, however, that it would be of greater interest to get right away at the methods of work. The great Brunswick clay deposit, referred to in previous papers, however, is worthy of a note to itself, seeing that upon its brickmaking

qualities depends the permanency of the greater part of the present city of Melbourne. The material belongs to the upper Silurian age of the Paleozoic series, and consists chiefly of micaceous mudstones, with occasional sandy patches. Superficially, it is decomposed, and oxidation has effected its color, turning it into a yellowish gray for a depth of eighty feet or so—that is, down to the water line. Below this the material appears of a dull bluish slate color, is very dense, and, as mentioned in the first paper, makes a very high-class brick. The precise chemical composition varies somewhat in different parts. Suffice to say that it is a finely comminuted feldspathic material, being a more or less hydrated silicate of alumina.

In my former papers I have described the methods employed here in connection with the manufacture of brick by the dry press and continuous kiln. I propose now to give a few details as to the manufacture of plastic brick. So little of this kind of work is going on at the present time near the city that I had some difficulty in obtaining the necessary information. On visiting Mr. Sweet's establishment at Brunswick, however, I found that he made, besides sewer pipe, like his neighbors, a very fine quality of white, buff and ornamental brick, for which a good price is always obtained.

The clay is drawn from the pit upon the premises and goes through a thorough process of treatment before it reaches the machine. After passing through the dry pan crushers, the elevators take it over the hopper, which leads into a horizontal mixer of Faucett's manufacture (cut A), where it is thoroughly mixed, the proper quantity of water being added during the

process. From this it passes through two horizontal pug mills, one of which is connected with the brickmaking machine. This is one of Machar & Teale's manufacture, a Melbourne firm, and is a wire cutting side delivery machine, capable of cutting eleven brick at a time. From this the brick are taken to the drying sheds and hauled, where they remain from two to six days in ordinary weather. When sufficiently "set" they



FERRY'S SEWER PIPE WORKS, BRUNSWICK—INTERIOR PRESS SHED
FERRY'S WORKS—ONE OF THE "HAS BEENS."

are put through a hand press, capable of turning out 1,500 to 2,000 per day, plain or molded, as required.

They are then kilned. The kiln used for this purpose is of the old type, square up-draft, with fire holes on each side. The time of burning is about four days. Box timber is used for fuel, cut into four-foot lengths, about seventy tons measurement being required for each kiln, the cost being \$2.50 per ton. The capacity of the kiln is 60,000.

The price obtained for the white brick is from \$25 to \$30 per thousand; for those specially molded, about \$35. They are a very good sample, indeed, of both classes, being well and uniformly shaped, of good color and well burnt.

While in this yard, which is at present busy with sewer

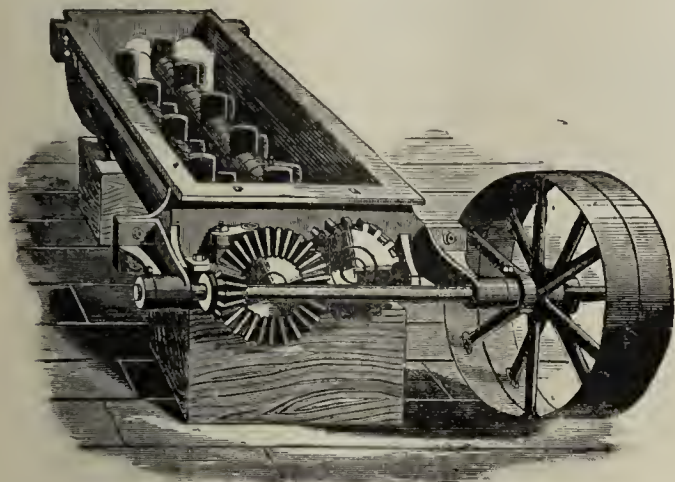


Figure A. Fawcett's Patent Clay Mixer.

pipes, I observed a steam pipe press of rather unusual form. It is one of Fawcett's horizontal types, and appeared to offer several advantages over the more ordinary vertical kind. I send with this an illustration of it, showing its construction. (Cut B.)

I also took occasion while here to inspect and measure up one of the circular kilns, which is used for pipe burning. It may be taken as a fair sample of the type used in this colony for such purposes. A dimensioned sketch is submitted herewith. It presents nothing perhaps novel, but it certainly appears to answer the purpose very well, turning out excellent samples of ware, very uniformly burnt, and with little loss.

The only question is as to their economy in respect to the fuel used. Cut C gives a view of the chief part of Mr. Sweet's works, the pit being in the foreground, one of the kilns under cover on the left, and the drying and mixing and manufacturing sheds extending toward the right, the large shed at the end containing two other kilns of more recent date.

It has always appeared to me that in circular up-draft or down draft kiln, such as are used for burning pottery and sewer pipe, there must of necessity be a great waste of heat. Immediately the heated air has passed through the kiln it has

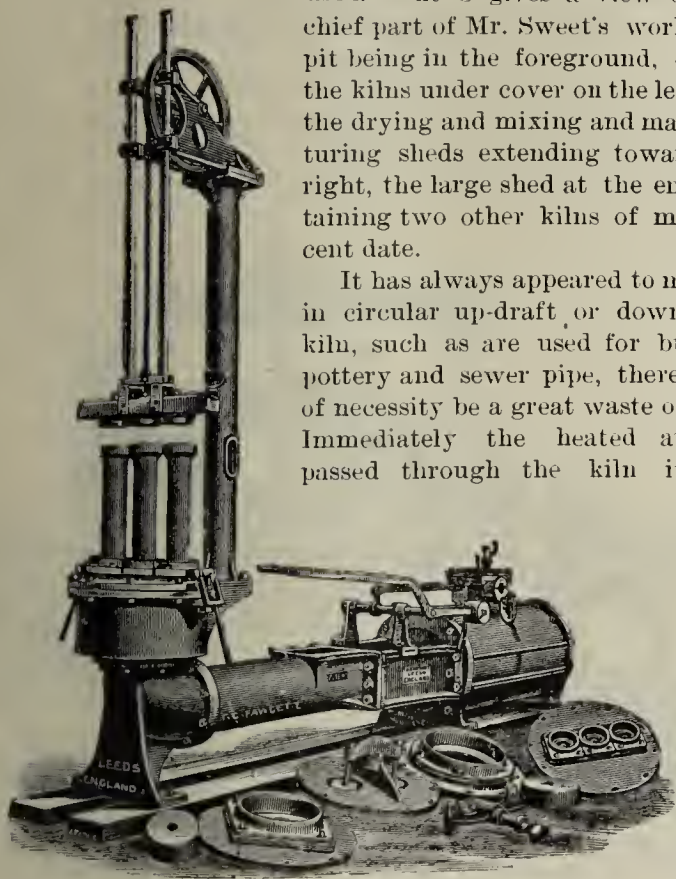


Figure B. Acme Pipe Making Machine.

done its work, and every unit passing along the flue to the chimney stack represents wasted heat, which is only another name for wasted money. In burning brick this has been remedied by the introduction of continuous kilns of the Hoffmann and other types, but so far as this country is concerned the

same principle does not appear to have been applied to kilns for other purposes. I should gather, however, from an examination of the Clay-Worker, and especially of the advertisements, that such kilns are to be found in America. Of course, it is evident that pipes must be stacked in a vertical position so as to prevent their warping and sagging when the fire comes on them; it is also evident that the heated air must pass through them in the direction of their length, otherwise they would not be uniformly burnt. So the Hoffmann kiln, as constructed for brick, would not suit pipes, but there should not be much difficulty in modifying the form to suit the altered requirements. Hearing that this had actually been done, I paid a visit to Mr. Ferry's works to see the result.

Mr. G. Ferry has been engaged in clayworking for many years in Brunswick, that great center of the industry. His attention has been chiefly devoted to terra cotta work, and he has been successful in producing a good quality of ware, more or less artistic in character.

The demand, however, for this class of goods having for the past year or two been slack, Mr. Ferry decided to enter upon the manufacture of sewer pipe, for which there was a more active demand. With this view he leased an idle brick plant, and set himself to modify it to suit the requirements of this



Figure C. Sweet's Brick and Tile Works, Brunswick.

new branch of business. At his works the clay is the same as that used by other firms, and so is the preparation of it. There is a Fawcett press, thirty-six inches in diameter, busily employed turning out flanged pipes, and there are two smaller presses putting out barrels only. These two are made by Mr. H. V. Hampton, of this city. They are vertical anger presses of simple construction, and appear well up to their work. For these smaller pipes so made the flanges are put on at the wheel by hand, and also by a machine, the invention of Mr. Ferry himself. This is the first of the kind I have seen, and is decidedly ingenious. I must refrain from giving a full description of it, in accordance with a promise given the inventor, but I may say it consists of a steel-faced mold in two parts, of the shape of the flange, working upon a table. The barrel of the pipe is placed, end up, upon this table and the molds supplied with clay; then, by a simple motion of a lever, they close upon the end of the barrel and form thereon a clean and compact flange. They do their work very neatly, and about six times as fast as it can be done by hand.

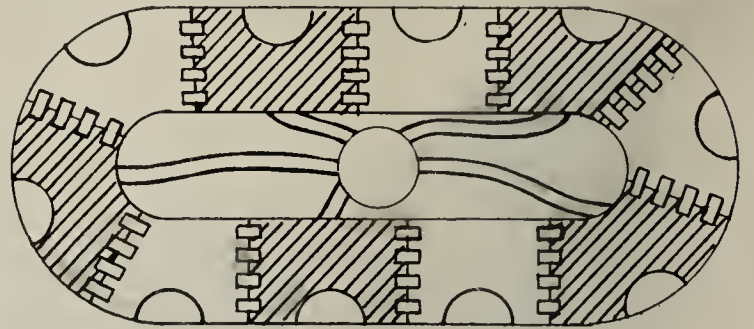
But to come to the kiln, which was the reason of my visit. I found, rather to my disappointment, that, though ingenious, it was in no way an application of the Hoffmann principle; it was merely an adaptation of the Hoffmann kiln.

Across the kiln partition walls have been built, dividing it into five small kilns, with an open chamber between each. These kilns are connected by flues with the central chimney stack, but not in any way with one another. They are fired from four furnaces on each side. They answer the purpose very well, and burn the pipes, apparently, quite as well as the round detached kilns, the chief drawback being the heat in the inclosed spaces between, where the burner has to work. The old feeding floor above makes an excellent drying space for the green pipes. Besides this kiln, there are two round down-draft kilns of the usual sort, twenty-four feet in diameter. The

work flanging a large pipe which is standing on the wheel.

—One of the "Has Beens."—

Brickyards and brick companies, like most things in this



Floor Plan of Continuous Kiln.

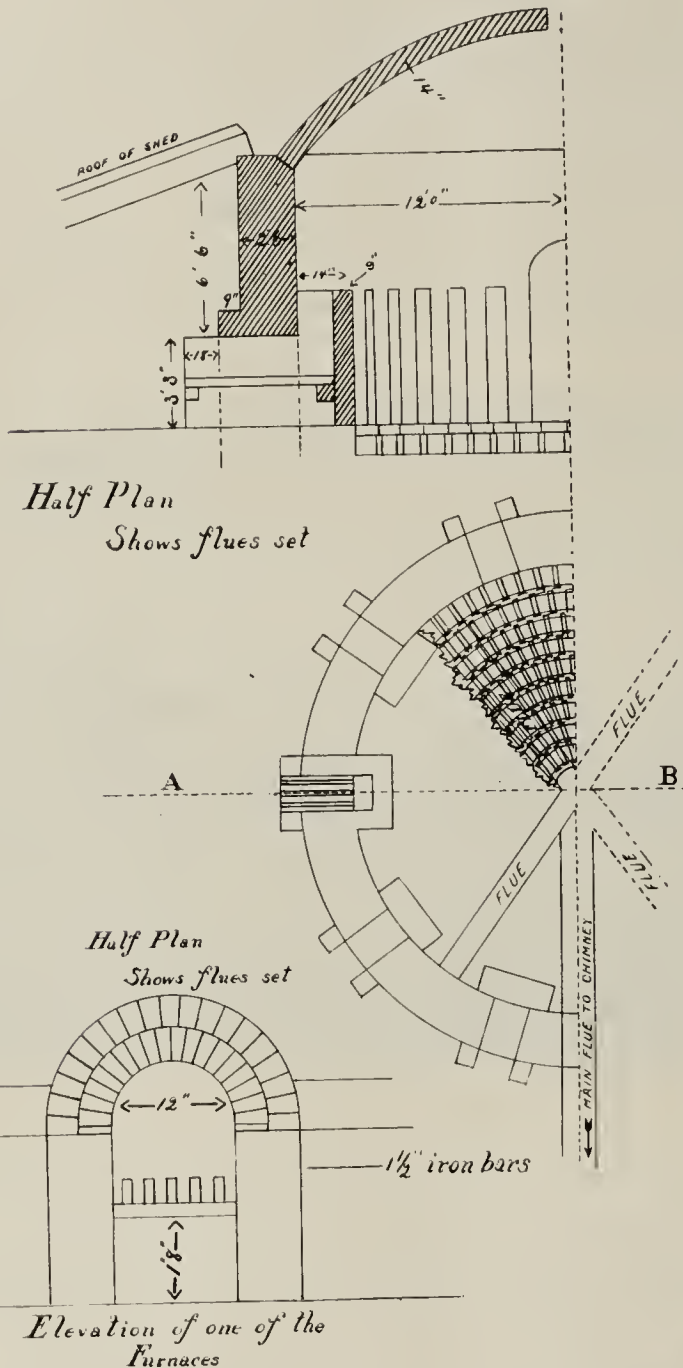
world, experience ups and downs. Of late, in these parts, there have been more of the latter than the former. Writing to a company, the other day, which at one time had good prospects and a large business, I received a concise memorandum to the effect that the company was defunct, the works idle, and nothing was to be learned from inspection or inquiry except the "moral." This is signed by the liquidator.

An idle factory is at all times a melancholy sight, but an idle brickyard is positively depressing. The pits filled with water, the empty kilns, the rusty rails of the tram lines and the drying sheds fast falling into disrepair are enough to make the most cheerful man feel sad, and when the scene is faced by a great auctioneer's placard, referring to the place as a splendid or magnificent property, he does not feel any better. In my rambles I passed such a place and reproduced it. It is not, fortunately, typical of our clayworking factories, but it goes to show that brickmaking, even in a new country such as this, may be overdone, and that something more is required to win success besides good clay and sufficient capital, and that is good management.

RECONSTRUCTED GRANITE BUILDING BLOCKS.

Publishers Clay-Worker:

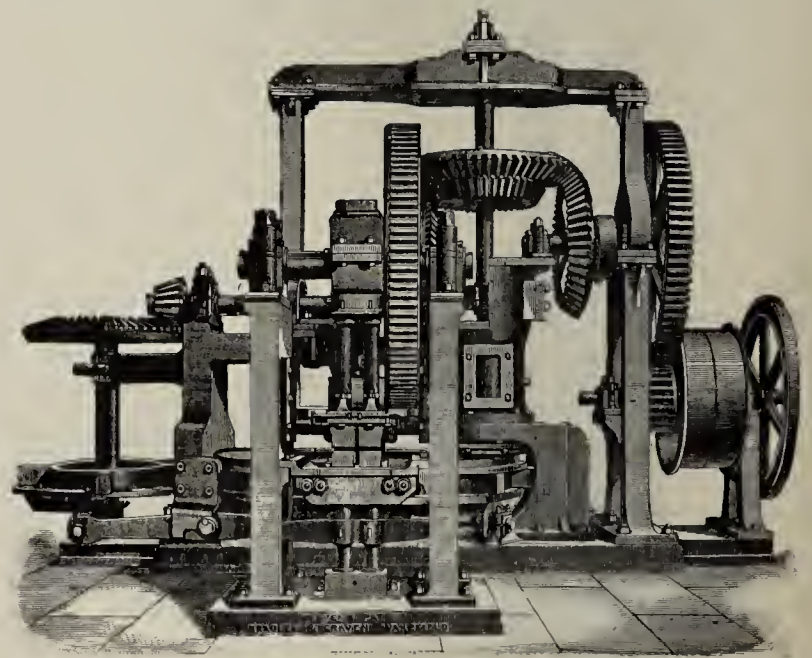
Your circular letter of the 18th ult., inclosing bill for renewal of my subscription to the Clay-Worker, has been overlooked, and I inclose herewith my check for \$2 in payment of



output of the works is about 5,000 per week, and the general character of the ware is excellent.

I send two photos, cut D being a view between the Hoffmann kiln on the left and the other kiln shed on the right. The walls of this shed are somewhat unique, being built up of condemned pipe, the result being a cool and well-ventilated shed. At the back of the view is the pipe press shed and the group in the foreground consists of Mr. Ferry on the left, his clerk on the right and the six-year-old son of the writer in the center.

Cut E shows the interior of the pipe press shed, with the men at work. Owing to the darkness of the interior the presses did not come out very clearly, and the flecks of sunlight coming through the roof have rather a strange appearance. The large pipe press is on the right, and on the left is a group at



Craven's Patent Brickmaking Machine.

my subscription for one year in advance. I value your paper very highly, and would not be without it willingly.

The Reconstructed Granite Company, after a year's hard work in perfecting its processes and machinery, is now fairly in the market, having made permanent arrangements for the

manufacture of reconstructed granite building blocks, plain and ornamental, at the works of the Pennsylvania Enamelled Brick Company, at Perkiomen, Pa., and the outlook is favorable for a large business. At present we are not prepared to undertake any very large and elaborate ornamental pieces, but any blocks not exceeding a front area of 12x18 inches, either plain, ashler faced or ornamental, can be furnished promptly and satisfactorily. Later it will extend its scope. Will forward you a sample shortly.

WM. COURTNEY, President.

New York, April 17, 1897.

Written for the CLAY-WORKER.

DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.

BY E. G. DURANT.

TWO GENERAL PROPOSITIONS may be considered as underlying and furnishing a basis for the belief we have that ornamental machine-made hollow building blocks are to come into general use for architectural purposes.

The first proposition is that when enough raw material has gone into building construction to secure abundant strength and to protect against weather conditions, anything used in excess, except for ornamentation, is a waste and folly.

Second Proposition—Any method of manufacturing that will add beauty and variety to a building material without sacrifice to its useful qualities, but adding thereto, and with no appreciable addition to the cost, deserves and will find favor with both the manufacturer and the consumer or user of such material.

This second proposition, we claim, has been met in the production of hollow building wares as against brick.

When any new industry or any new development of an industry presents itself on paper to the craftsman whose experience is nearest allied to it, in the absence of personal investigation of processes, and the following out of these processes to definite and ascertained results, intelligent, practical men may come to well settled conclusions from a careful consideration of the underlying principles pertaining thereto, and while the writer will refer mainly to his own and others' experience in developing the subject in hand, he desires to secure at the outset the indorsement of the above-named propositions by the reader, in order that the facts presented may have their due weight, and we ask our readers to once more read and carefully consider the propositions and to accept or reject them before going further with us.

—Under the First Proposition—

We may boldly state that brick, as made and used in this country to-day, do represent "waste and folly," and cannot, for general purposes, long survive the competition which is to come from the production of hollow clay wares for building purposes, whether in the form of brick or blocks. The change has already taken place in Germany, as has been shown in the pages of the Clay-Worker the past year, but our German friends have only taken the first step in the right direction.

Our claim of "waste and folly" on the part of the brick manufacturer is based upon the fact—as we shall prove—that he is using more than double the material necessary for strength or for protection against the elements, the result being a waste of fuel and labor in about equal proportion to the excess of clay used in his product.

—For What Strength Is Required.—

It may not be generally understood that by far the heaviest duty required of brick or stone is, in a wall of any height, or where used for the superstructure as well as for foundations, the carrying of their own weight.

To illustrate: Suppose we have a twelve-inch-thick wall,

thirty feet in height. Such a wall will weigh, of brick, as ordinarily estimated, 110 pounds per cubic foot, and hence the lowest tier of brick in such wall will be required to sustain a load of 3,300 pounds for each lineal foot of wall.

Now, what added load will two floors, ceiling, plaster, roof, etc., impose? We can answer, not over 300 pounds per foot for first-class dwelling construction, and that furniture, etc., will not reach fifty pounds more.

So here we find eleven-twelfths of the duty imposed upon the strength of the wall is the carrying of its own weight. How is it with a first-class building block called to occupy the same place? We will take a standard block for such use, as shown in sketch, with walls one inch thick. Such a block will weigh per cubic foot of wall about fifty pounds, and hence the total weight of blocks resting upon the lower tier of a thirty-



Exhibit of Architectural Terra Cotta. See page 426.

foot wall will be about 1,450 pounds, instead of 3,300 pounds, as in the case of brick. Let us now refer to comparative

—Strength of Brick and Blocks.—

I am sorry I have not at hand carefully prepared and reliable data showing the crushing value of common brick made in the States (which is, of course, a varying quantity), but I have reports of tests made of brick made at Toronto, Ontario, being from four different yards. The tests were made for the Ontario Association of Architects by the School of Practical Science, a department of the McGill University, of Montreal, and was a test of brick piers laid in Portland cement mortar and properly seasoned. The average crushing strength was 182,000 pounds per square foot. Within the past year, also, tests have been made in London, England, of "London stock" brick, also laid in Portland cement mortar, the tests being made at the instance of an architectural or engineering association. The result of a number of tests was an average crushing strength of 168,550 pounds per square foot. Of course, there are bricks of higher grade which will bear much higher tests,

but we presume the Toronto brick will fairly represent the average of common brick made in this country.

Still, we are disposed to give some credit to the Yankee brickmaker, and in our table of comparisons will allow that a first-class machine brick made in the use of the same machinery we employ in the production of our blocks will stand a test double that awarded to our Toronto cousins.

While we have not had the opportunity of testing bricks and hollow blocks made from the same clays and by the same machinery, our observation has led us to the conclusion that a square inch of the vertical wall of a hollow block will bear a much greater pressure than an equal surface of brick made from the same clay.

It is well known that the surface or skin of a machine-made brick is more firmly compacted than the center, and is more thoroughly burned, and as a consequence will bear a much greater compression or tension strain. For this reason the thin walls of a hollow block (if not too thin) are stronger in proportion than brick. We have before us the results of various tests of blocks, with walls from three-quarters to one and one-half inches in thickness, and we find that the thin walls (under one inch) average near 2,000 pounds per square inch more than the one-and-one-half-inch walls.

As the clays were not the same, the tests are not conclusive as to the truth of our theories, but the clay alone does not fully determine results. The treatment it receives has much to do with strength of the product. In the case before us we think the thick-walled blocks received what would be generally called the most scientific treatment.

—Tests of Hollow Blocks.—

We give below the results obtained from testing blocks made from common alluvial clays, four samples in all from two or more clays. These tests were made by the United States government at the Watertown Arsenal, for the American Building Block Company, of Akron, O., and E. Bigelow, of West Bend, O., President of the Ohio Tile and Brick Association. The average crushing strength of these blocks was found to be 6,595 pounds per square inch. We also give tests of blocks made from bastard fire clays, by and for the parties named below:

The Pittsburg Testing and Laboratory Company, for the Ohio Hollow Block Company, Canton, O.; the Rose Polytechnic Institute, for Brazil Brick and Pipe Company, Brazil, Ind.; the United States government, for the American Building Block Company, Akron, O.—four tests in all, the average compression strength being 7,200 pounds per square inch of wall of blocks.

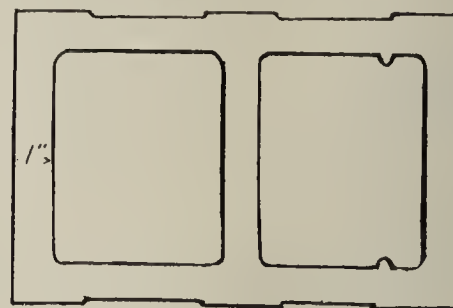
By way of illustration let us show the comparative strength of brick and blocks, using as a basis the figures above cited. The highest chimney in Great Britain is said to be at Glasgow, and has a height of 468 feet. The blocks of the style already shown in above sketch will weigh about fifty pounds per cubic foot, and have thirty-six inches of vertical wall section to each foot of block. Estimated at the value furnished by the tests above given, we make up the following comparative table:

Material used.	Pounds per square foot at chimney base.	Crushing value.	Per cent. of value used.
Toronto brick.....	51,480	182,000	28.28
London stock brick.....	51,480	168,000	30.64
Hollow blks., comm'n clay.....	23,400	237,420	9.85
Hollow blks., fire clay.....	23,400	259,200	9.03
U. S. brick, at double Toronto value.....	51,480	364,000	14.14

We think the foregoing will undeceive many as to the value of blocks for heavy construction, for it very clearly demonstrates that the blocks may be used where good brick would not be admissible, a 10 per cent. strain being regarded as about the highest factor of safety, the blocks, even in the extreme case given, coming within this requirement, while the brick, even when the highest test figures are doubled, do not meet the requirement.

We know there are bricks made that will equal the value of

the blocks as given, and exceed them, but such brick are not ordinarily used for heavy walls, and are exceptional, but it will be borne in mind that the block shown and used in these



Standard Building Block, $8\frac{1}{4} \times 12 \times 16\frac{1}{2}$.

computations may have another partition given it, increasing its value by 33 per cent., and still weigh but about 50 per cent. as much as brick.

Written for the CLAY-WORKER.

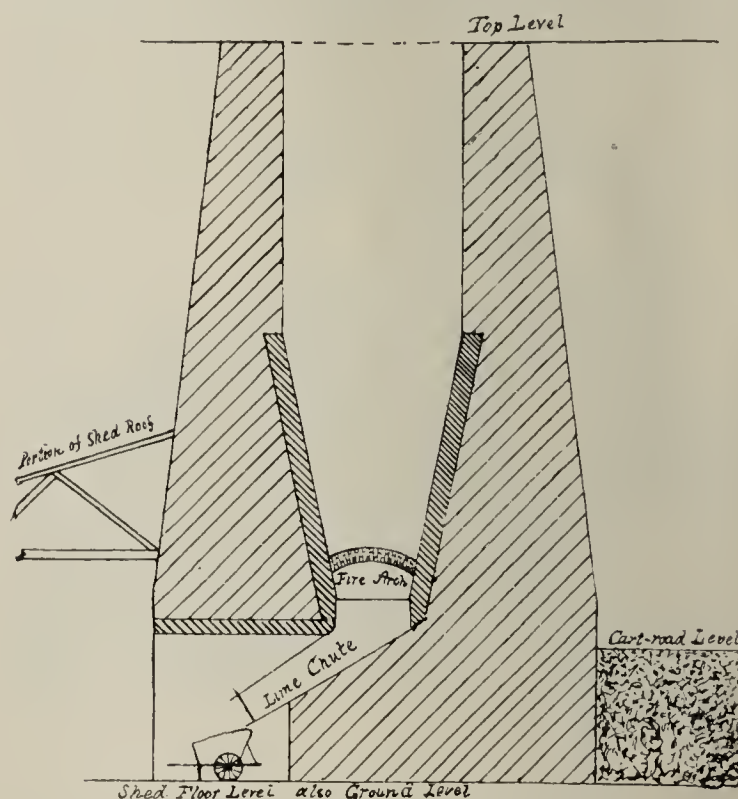
CHEMISTRY FOR CLAYWORKERS. No. 52.

Lime, Lime Burning and Lime Kilns.



LIME HAS HAD some attention in former numbers of this magazine, but recently requests have reached me from Canada and the States for a practical paper on the burning of lime and a description of kilns used for that purpose.

Those readers who have read these papers or have made themselves acquainted with the rudiments of chemistry from other sources need not be informed that the object of lime burning is to deprive the limestone—which, in this case, is a carbonate—of its carbonic acid and moisture. Strange as it may appear, many practical and successful lime burners are not aware of this fact; they, like many other craftsmen, are taught that a certain routine is only necessary to produce certain results, and that is all there is to it. Give limestone a certain amount of heat at a certain temperature and you will cer-

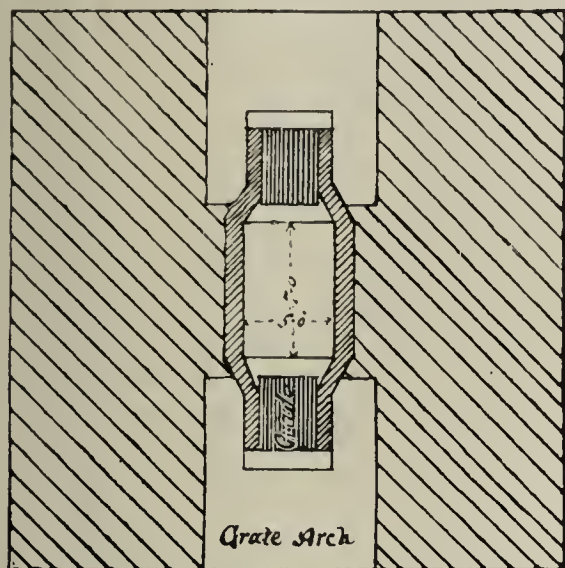


Vertical Section of a Quincy, Ill., Lime Kiln.

tainly convert it into caustic lime. Heat is the agent employed to expel both moisture and carbonic acid, therefore the lime burner ought to be acquainted with the laws governing the

burning of fuel for producing the heat he needs in his lime kiln, also the laws for distributing the heat he produces, but what are the facts? He is woefully ignorant of any such laws; moreover, he is not supposed to need knowledge of this kind to burn lime; the methods of his father or his boss are considered sufficient for him.

If the lime industry must keep up with other kindred in-



Horizontal Section of a Quincey Kiln on Grate Level.

dustries it must cast off its empirical and antiquated ideas and adopt such formulae and practice as have been established on scientific bases. It must abandon all such trite sayings and ideas as "Let well enough alone," at least until it comprehends fully that state of affairs which may be truly termed "well enough." To sit down and content ourselves with such an adage is to assume that the goal of perfection has been reached, whereas, the truth of the matter is, we have accomplished some slight improvement and are so tickled with it that we are afraid to attempt further improvement, lest we spoil or lose the advantage gained.

Lime burning is in many respects like brick burning, for limestone varies in its composition as much as clay does, and small percentages of certain substances will materially affect the burning of either, only it so happens that the refractory substance in one is a fluxing substance in the other; for example, the most refractory fire brick (silica brick) loses its refractoriness if a small percentage of lime is mixed with the silica. (In this it must be understood a small percentage above what is absolutely necessary to obtain adhesiveness in the raw material.) Lime and silica are each infusible in the flame of the oxy-hydrogen blow pipe, but certain mixtures of the two are easily fusible. The brick burner experiences no difficulty in fusing bricks made from marly clay (clay with a considerable percentage of lime); on the other hand, the lime burner easily overburns lime containing a moderate percentage of silica. In both cases overburning is due to the ease with which silicate of lime is formed. It is impossible to overburn pure lime in any kiln of the present period, so that really it is not overburnt lime, but a mixture of lime and silica, that has been fused. Such a fused mixture will not slake, because it is now protected by a thin glaze which is impervious to water. Practically it is burnt and spoiled, but it is just as well to know the why and wherefore of it.

The purer the limestone the easier and quicker it may be burnt, for the hotter the fire the quicker the carbonic acid is expelled, and this without fear of fusing or overburning.

The kilns of half a century ago or more were of the inverted cone type, with one or more openings at the bottom for taking out the burnt lime. The top was open, and from twelve to eighteen feet diameter. The charges consisted of a thin layer of coal and a thick layer of limestone, so on alternately. The intelligent burner of to-day will easily perceive the gross wastefulness of such a system of using fuel, to say nothing of the

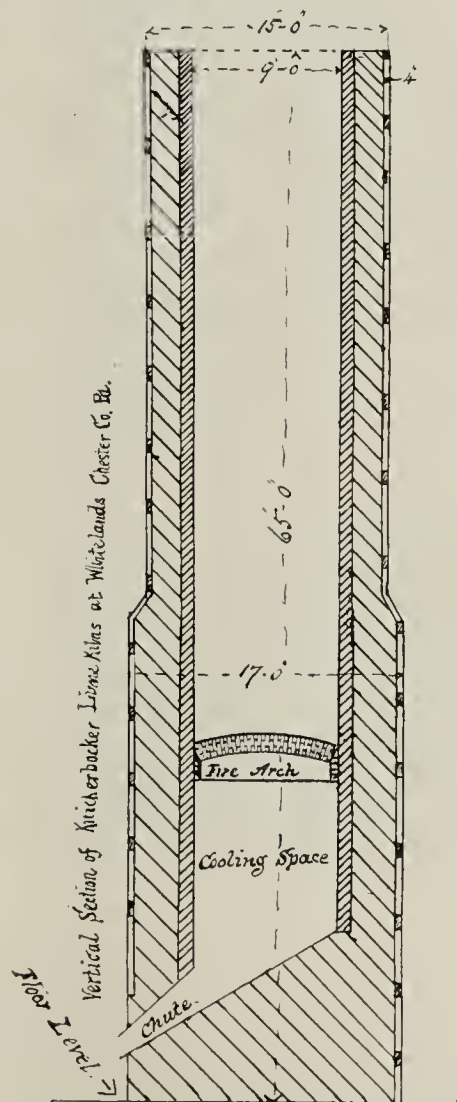
inconvenience of having the ashes, etc., mixed with the lime. The waste of fuel in this antiquated method of lime burning—and, incidentally, I may say brick burning, too—may not be so apparent to some, therefore it may be well to examine the conditions of the fuel so placed in one of these lime kilns. In the first place, say the starting of a kiln, a quantity of fuel must be placed in the bottom of the kiln, a large quantity for a start, to dry out, warm up, etc.; then follow the alternate layers of limestone and fuel. Now, those readers of the Clay-Worker who have made a study of fuel and its burning in a chemical sense, as laid down so often in this journal, cannot fail to see the impossibility of fuel so placed in a lime kiln ever burning until it gets near the bottom, where it meets with an air supply, for not only are the upper courses deprived of air, but they are smothered by an atmosphere of carbonic acid, in which fuel cannot burn. The products of combustion from the lowest course are quite sufficient to prevent the burning of any course above, but in addition to this there is the carbonic acid given off by the burning lime. A portion of this is converted into carbonic oxide by passing through the hot fuel above, and there being no air to burn it again into carbonic acid, it escapes, taking along with it millions of atoms of invisible, unburnt carbon. This is what takes place when anthracite coal, coke or charcoal is used, but a much greater loss occurs when soft or bituminous coal is used. It descends with little or no change until that portion of the kiln is reached having a temperature of 800 or 900 degrees Fahr.; then the hydro-carbons commence leaving the coal, and, finding no supporter of combustion, escape unconsumed, which means a loss of from 30 to 50 per cent. A still further loss occurs

lower down in the kiln, precisely the same as takes place with anthracite described above.

All the above has reference to a system of lime burning pretty nearly extinct, but inferences may be drawn and applied to other systems of burning fuel, for example, does it not point to a fallacy in having a double length of grate under boilers, and to one also in the long, narrow grates in the Dutch brick kiln, etc?

—Lime Kilns.—

These are as diversified in form and size as the brick kiln, but up to date I have neither seen nor heard of a down-draft lime kiln. Nearly all are on the continuous principle. The most primitive kilns I ever saw were in Nova Scotia. They were from twelve to fifteen feet high, shaped like an egg cup, about nine feet in diameter at top and three feet at bottom. They were lined with fire stone, ground quartz and bastard fire clay, and cased with wooden logs, the "filling

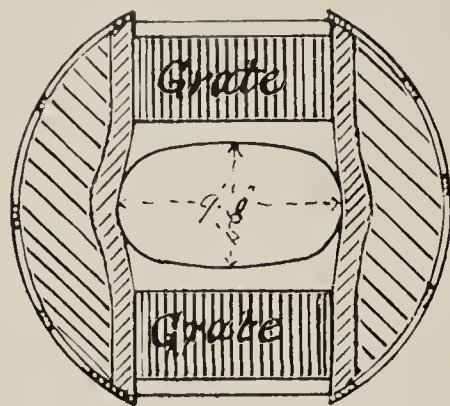


in" being rocks and dirt. The exterior was square and put together log-cabin fashion. The fuel was wood.

The first lime kilns that came under my notice were built into the side of a hill, not along a hillside, but cut straight into it. There were six kilns, and they all discharged into a tunnel, the delivery chutes being on one side. A standard gauge rail-

way was laid to the far end of the tunnel, just beyond the chute of No. 6 kiln. Iron cars, holding about fifty bushels, were used for drawing the lime. A kiln was burnt and then emptied and filled again. Soft or bituminous coal was used in the manner above described. The kilns were about twelve feet in diameter at top, and retained that size for about half way down, then the diameter gradually diminished to about three feet at the bottom. They were thirty-five to forty feet high or deep, and were considered second to none in the country (England) at that time—1813. I was too young at that time to pay any attention to the working of the kilns or their output, but I have seen many kilns of much later date that were also much cruder and

less efficient. The kilns above mentioned ante-dated 1843 by thirty years or more. If my memory serves me rightly, the date on the key-stone of the tunnel is 1812. Much of the lime thus burnt was used in the blast furnaces of the company for fluxing. The limestone came from quarries about seven miles distant, by canal boats, a branch canal being built up to the



Horizontal Section of Knickerbocker Lime Kiln at Grate Level.

kilns. The coal was mined by the company, and was conveyed to the kilns by railroad. This and the canal were on the top level of the kilns.

The modern kiln, as seen in the principal lime districts in this country, has furnaces with grates, generally two, placed opposite each other near the bottom of the kiln; the heat, flame, etc., entering the kiln by a flat arched opening, are distributed in much the same manner as in a properly set brick kiln.

By the courtesy of Mr. Charles Mercer & Co., of Quincy, Ill., I was permitted, a few years ago, to make a few notes and observations on their kilns in that district. Some of the kilns are huge masses of coarse masonry, square in plan outside, and tied and braced with heavy beams of wood and long iron bolts. They are about fifty feet high, and have a strong resemblance to the blast furnaces of fifty years ago. The sides are battered so that the top is somewhat less than the bottom, diminishing from about thirty-five feet square to about twenty-five feet square at top. The inside of the kiln is round at the top, about fifteen feet diameter, diminishing gradually and changing into an oblong at the bottom, or fire level, to $4\frac{1}{2} \times 6$ feet. About three feet below fire level is a heavy iron chute at an angle of about 45 degrees. It is provided with sliding gates for the discharge of the lime. The furnaces are, as I have said, at sides opposite each other, and are about five feet long by two and one-half feet wide. The fuel used is wood and soft coal, about half and half—that is, as near as the burner can guess it. They make a draw of about twenty-five barrels every six hours. The capacity of each kiln is therefore about one hundred barrels in twenty-four hours, with a consumption of about two tons of soft lump coal and two cords of wood in that time. The kilns are arranged in rows of four or six, as the case may be, with working space between them, and a good wide shed running the whole length on the side next the railway, the floor level being the level of the railway. In this shed the lime is drawn into iron barrows and dumped on a brick floor to cool, and there it is also barreled and loaded into cars for shipment. At one end of this shed is the cooper's shop for making the barrels, etc.

The floor level on the opposite side of the kiln is some eight feet above the level of the shed. On this is a cart road for the conveyance of the wood and coal to the furnaces and the removal of ashes, dirt, etc.

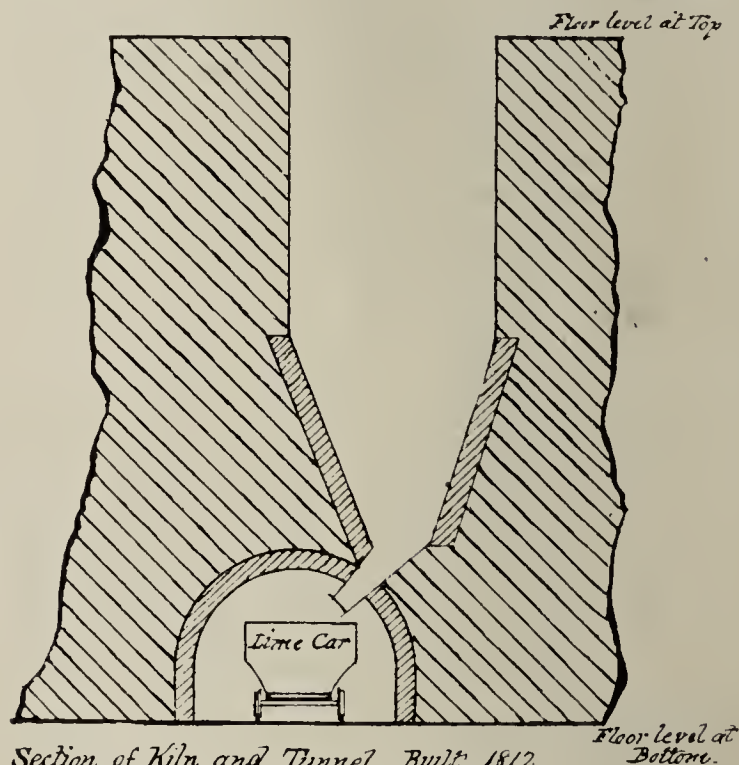
The kilns are fed by a special dump car, drawn up an incline on trestle work a few feet above the top of kilns and par-

tially over them, so as to dump the load into the kiln. The car then is allowed to descend to the bottom for another load. The quarry is close by, and the hauling of the stone to the dumping car is done by carts. Two cart loads are one load for the dumping car. A pair of small winding engines are used to haul the dumping car up the incline with a wire rope.

The quarrying of the stone is accomplished chiefly by dynamite. Holes two and one-half to three inches in diameter are drilled by steam drills to a depth of twenty to thirty feet. Four to six of these are got ready, charged with dynamite and exploded by electricity, dislodging hundreds of tons of limestone, which, of course, has to be broken up into convenient lumps for burning.

One of the most modern and largest plants in the States is owned by the Knickerbocker Lime Company, with principal office and immense storage sheds on Twenty-fourth street, below Callowhill street, Philadelphia. Their works are at East Whiteland, in Chester county, about twenty-four miles to the west of Philadelphia. Here they have twelve kilns, all bottom fired or continuous. Eight of these have solid masonry bases, about thirty feet square and thirty-five feet high. These have immense iron stacks, thirty feet high, to increase the draft. The other four are of a more modern type, and are each contained in an iron casing, seventeen feet diameter at bottom and fifteen feet diameter at top, and are sixty-five feet high, with a four-inch air space between the masonry and casing to modify expansion. The furnaces in the newest kilns are placed sixteen feet from the bottom, giving a good space below the grate for cooling the lime. They draw every three hours, and the lime drawn is practically cold. The kilns are fed by cars with a drop bottom, and are hauled by a locomotive from the quarries, which are close by, and run up a trestle to the tops of the kilns and immediately over them, and discharged by dropping the bottoms.

The fuel used is two-thirds wood and one-third anthracite coal. On comparing the accompanying sketches it will be seen that the Knickerbocker Company place their grates on the long sides of an oval, while the Quincy Company place theirs on the short sides, or ends of an oblong. I remember the Quincy peo-



Section of Kiln and Tunnel Built 1812
Cadnor Park, Derbyshire, England.

ple had trouble when they increased their oblong from $4 \times 5\frac{1}{2}$ feet to 5×7 feet. The fire would not penetrate to the center, and, it would seem, it did not occur to them to turn their oblong round and fire on the long side with a wider grate.

There is little difference in the sectional area of the Knickerbocker and Quincy kilns down at the furnace level, yet the

Knickerbocker burns more than double the quantity of lime; true, it has much wider grates and burns much more fuel.

The cooling space below the grate level is a great advantage, saving once handling. There is also great economy in ground space when the kilns are incased in iron, for they stand on about one-fourth the space. In iron they stand on a circular space seventeen feet in diameter, while in masonry they occupy a space thirty feet square.

Of course, an iron-cased kiln is not within the reach of all who burn lime. There is considerable lime burnt in less pretentious kilns. There are several just outside Bridgeport, Pa., which are little more than a heavy retaining wall in front, with openings for drawing the lime. The space behind the wall is filled in with dirt, etc., except the space occupied by the kilns, where you will find eight or ten in a row. A road with a gentle grade leads up to the top of the kilns, and the limestone and fuel are carted up.

Jacob Morris burns lime here. Several years ago one of the lime burners here thought it hard lines to have to remove and find stowage for six or seven feet in depth of earth to get to his limestone; about five feet of this was clay. It occurred to him that if he converted this clay into bricks it might at least pay him for laying bare his limestone. He accordingly bought machinery and built kilns, which have grown into a decent little brickyard, now owned and run by the above-mentioned Jacob Morris. He is a lime burner, and, incidentally, a brick-maker, too.

The sketches accompanying this article are probably not absolutely correct in detail, but sufficiently so to convey a general idea. No definite plan and dimensions will meet the circumstances of every place nor the magnitude of every investor's pocketbook, hence there can be no universal lime kiln, brick kiln, etc.

WM. WAPLINGTON.

Written for the CLAY-WORKER.

A "STILEISH" BRICKYARD—IN THE LAND OF WOODEN NUTMEGS.



IN NORTH HAVEN, CONN., where the River Quinnipiac twists and winds its sluggish way towards Long Island Sound, is situated the well-known brickyard of L. L. Stiles & Son. This is probably the oldest yard doing business in the State, having been operated continually by the Stiles family for more than fifty years. When the civil war broke out the late L. L. Stiles was operating the yard in company with his brother, Henry H. Stiles, but in 1862 the latter's patriotism induced

him to enlist in the Fifteenth Connecticut Volunteers, of which he subsequently became the colonel.

At the close of the struggle he returned to North Haven, but lived only a year or two to enjoy peace, the fruit of his country's sacrifice.

Mr. Isaac Stiles eventually took his son Frank into partnership, and the firm name became as it now is. Father and son worked incessantly to keep their plant in the front rank, and if results are to be considered as the standard of excellence they certainly succeeded.

July 1, 1895, after a week's illness, Isaac L. Stiles was called to join his fathers, at the age of seventy-six. Since his father's death Mr. Frank Stiles has had entire management of the brickyards, and the high reputation of their product has in no way suffered by the change.

When the writer visited the plant he was unfortunate in not finding Mr. Stiles at home, but through the kindness of Superintendent Samuel Bannell and Head Bookkeeper S. B. Thorpe he was able to make a careful inspection of the works and collect the information herein presented. All the machinery used at the yard, with the exception of the engines and boilers, was made in their own machine shop. The presses, of which there

are five, each having a daily capacity of 43,000, were designed by Superintendent Bannell, and are called the Stiles brick machine. The rack and pallet system of drying is employed, and they have shed room for 5,000,000 brick. Wood is the principal fuel employed, although coal is used to some extent. The power is furnished by two 60-horse-power boilers and an 80-horse-power engine, while a smaller engine furnishes power to the machine room and carpenter shop.

The concern owns nearly forty acres of fine clay, running as deep as a hundred feet. The clay is conveyed to the carts from the bottom of the pit by a huge derrick. From forty to



Glimpses of Frank Stiles's Brick Yard.

fifty horses are required to cart clay, brick, etc., and the stables contain some fine specimens of horse flesh.

Nearly two hundred men are employed in and about the yards, and the concern furnishes tenements for twenty families in their own houses, while the rest are provided for in the large boarding houses.

Every year Mr. Stiles buys large tracts of woodland and gives his steady hands employment during the winter months in cutting it up and bringing it to the brickyard in readiness for the next season's work, to be used as fuel.

The average rate of wages is \$22 per month and board for the busy season and \$1.25 per day for the balance of the year.

The annual product of the yards is 17,000,000 bricks, which are all sold through the New Haven branch of the Central New England Brick Exchange. Last year the company's orders were in excess of the supply, and they were forced to buy from other yards.

Until recently the firm operated three yards, the third being



Stiles's Brick Yard Store House.

devoted to pressed brick, but for certain good reasons they abandoned the pressed brick department and now manufacture only common red brick. They are common by name, but not common in comparison with other brick, having an even, rich red color, a sharp, clear ring, a clean, smooth face, and square, straight corners and angles.

A spur track from the N. Y., N. H. & H. Railroad runs through all the sheds, affording excellent shipping facilities. The principal markets for these brick are New Haven, Bridgeport, New London, Providence and points on the Shore line, and the average price is \$6.25 f. o. b. cars. Those brick used in New Haven are shipped to the firm's distributing station at New Haven and delivered by their own teams.

Mr. Stiles, while a very practical brickmaker and clever financier, has the good fortune to have in his employ some valuable assistants, such as Superintendent Baunell, who designed the Stiles brick machine. Mr. Baunell has had an experience of over thirty years in the brick business, having commenced his career at Haverstraw, N. Y. Later he went to Chicago and worked for Conklin & Campbell and J. Legnor. About the time Mr. Baunell left Chicago D. V. Purington started in the brick business close to where he was employed. He has been with Mr. Stiles for the past twelve years, and gave the writer his opinion that the North Haven brick were the finest common brick made in the country.

Head Bookkeeper Thorpe is well acquainted with his part of the business, having served in that capacity for many years. Mr. Thorpe can tell you all the advantages of his brick, and can quote freight rates to any point on the globe, from New Haven to Oshkosh.

With competent, contented workmen, an enviable reputation for fairness and square dealing, together with the well-known excellence of their product, this firm should, and probably will, increase their sales, extend their plant, and in the future, as in the past, keep in the front rank of the procession.

—A Chat with Captain Crafts.—

The Quinnipiac Brick Company, of which Capt. S. P. Crafts is General Manager, is situated at Quinnipiac Station, where they commenced making brick in 1873, using Niles machines. Some years later, when the open yard was superseded by the pallet system, Captain Crafts's genius asserted itself, and his fertile brain evolved new ideas in brick machinery, which at

the time threatened to revolutionize the brickmaking industry. But for some reason Mr. Crafts saw fit to reserve for his own advantage the benefits of his inventions, and to get an idea of the methods employed by him one should visit his yard, and under the Captain's guidance study the improvements he has introduced. The fuel used was wood until about ten years ago, when Mr. Crafts devised portable furnaces for coal, which they have continued to use ever since, enjoying the distinction of being the only yard in Connecticut to use coal as fuel exclusively. The Captain has experimented some with oil as fuel, but after trying every method which money or skill could suggest, he was forced to abandon the project as being unprofitable.

The company employs about forty hands during the season, and has a capacity of 42,000 per day, including pressed and common brick.

The power is furnished by an engine of 60-horse-power, fed with steam from two 40-horse-power boilers.

Speaking of the advantage derived from the Exchange, Mr. Crafts said that he was greatly benefited in many ways, chiefly that of keeping prices up where they belonged.

R. N. BUELL.

WORTH REPETITION.

Men who band themselves together to regulate other people's business and to find fault, generally injure themselves, upset good order, interfere with the best interests of the community and show their own folly and malice. The way to get along in this world is through efficiency, industry, forethought and economy, attending strictly to one's own business, laying by each day or each week a little addition to the store of knowledge and honest savings, and acting in all good will, fraternity and honor toward others.—National Printer-Journalist.

WANTS A BRICK GRINDER OR SIZING MACHINE.

Publishers Clay-Worker:

We want a machine for grinding down square brick for arches and angles. We think it is called sizing machine, and if you will inform such dealers or manufacturers of the fact, we will be greatly obliged to you.

We have just completed our fifth Endaly kiln, and if indications count we will have a most excellent business this year. We have a good many irons in the fire, making common and



Frank Stiles's Clay Bank.

face brick, buff, red and gray, plastic and dry press, besides our paving plant, which is coming to the front in this section. The writer finds deeper interest with each copy of the Clay-Worker, and it has come as part of his library, something almost indispensable in the line of business. With best wishes,
Rome, Ga., April 21, 1897.
H. H. McCLURE.

OBITUARY.

Death of J. W. Penfield, a Pioneer in the Manufacture of Brick and Tile Machinery.

THE CLAYWORKING FRATERNITY throughout the United States will be pained to learn of the recent death of a distinguished and honored fellow-member of the craft, Mr. James Williams Penfield, the well-known manufacturer, who passed away suddenly April 20, 1897, at Cambridgeboro, Pa., where he had gone in hopes of regaining his health, which had been failing for some time. The funeral services were held the following Thursday at the M. E. Church, Willoughby, O., in the presence of a large concourse of relatives, neighbors and friends, many of whom had come from a distance to pay this last tribute of respect to the memory of the departed one.

At the time of his death Mr. Penfield was sixty-eight years of age. His birthplace was Euclid township, Cuyahoga county, Ohio, but soon afterwards, with his parents, he removed to Willoughby Ridge, which was the scene of his first experiments in the clayworking line, as well as in the manufacture of machinery. Being naturally of an investigative turn of mind, and ever anxious to increase his fund of knowledge, he was never content to drop a subject that interested him until he had probed it to the bottom. So, when the matter of tile drainage came to his attention, he was deeply interested in it, and made it a subject of earnest study and research. At that time drain tile were produced by the use of hand-power machines, a process tedious, laborious and irksome in the extreme. Mr. Penfield had not taken up the matter long before he saw clearly that a power tile machine was a practical possibility, and he drew up plans for a machine of this kind. Being anxious to give the farmers the benefit of his research, and with no thought of entering into the manufacture of machinery himself, he wrote an article which was published in the American Agriculturist, giving directions how to make such a machine. To his surprise, a large amount of inquiry was the result. The farmers were anxious to get further details, while many of them wished to purchase the machinery or such parts of it as they could not readily make themselves. Thus the manufacturing business was practically thrust upon him.

The first machine he built was for his own use, and was of the plunger type, made chiefly of wood, with wooden shaft and wooden tub, and operated by horses attached to the end of a long wooden sweep. This pioneer machine was in active service at his tileyard at Willoughby Ridge for a number of years. Improvements were added, and in order to take up the work more advantageously, the scene of manufacture was transferred to Willoughby. One of the Penfield tile machines was exhibited at the Cincinnati Exposition as early as 1857, and was awarded a medal, which is now a cherished heirloom. From this time on the history of the industry founded by Mr. Penfield may be taken as a veritable index to the progress and advancement of the clayworking industry at large, and the Willoughby establishment has been a most potent factor in bringing clayworking to the degree of perfection and prominence it occupies to-day.

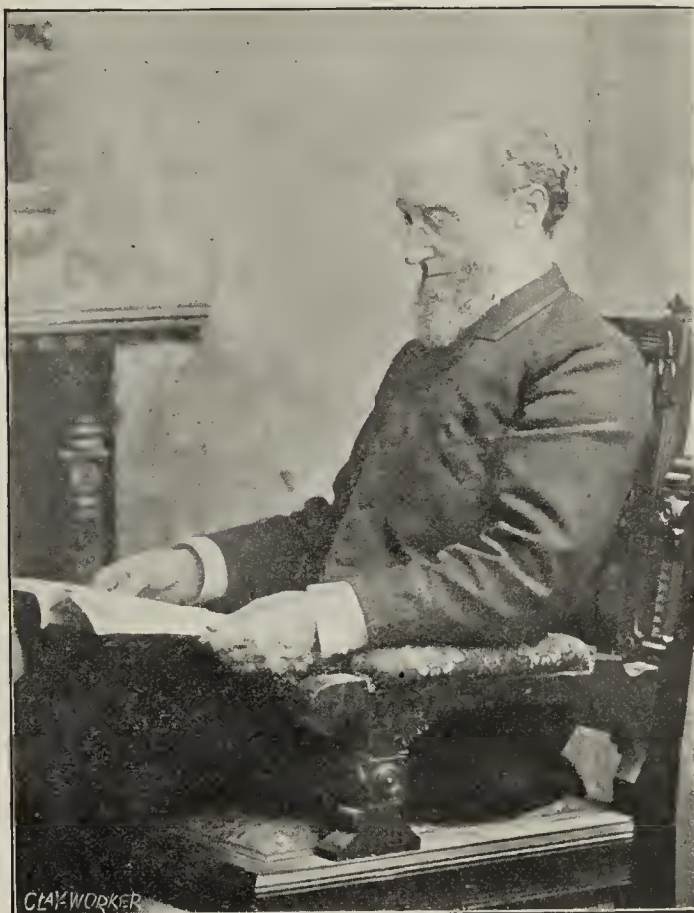
In the life of the business Mr. Penfield was a constant source of energy, life and vigor. Tireless in his efforts, full of zealous ambition, and with a determination that apparently nothing could daunt, he lent a hand to the work with a vim, and inspired a cheerful and hearty co-operation from those to whom the details of the business were intrusted. His bright and genial countenance, quick and elastic step, and boundless activity and enthusiasm were in themselves continual sources of encouragement and inspiration to those with whom he came in contact, and spurred them on to renewed determination and effort. Throughout it all he was of a warm, sunny disposition, kindly and sympathetic, ever ready to lend an ear to the sorrows and trials of others and to lend a hand to help lighten their burdens. It is not, therefore, to be wondered at that he

won in a remarkable degree the affection, admiration and esteem of his workmen and townsmen, and, in fact, of all who were so fortunate as to be associated or come in contact with him. He was a true Christian gentleman in every sense of the word, and the world to-day is immeasurably poorer because of his loss.

A search of the Patent Office records will show that Mr. Penfield was a prolific inventor of clayworking machinery and appliances. His thirst for knowledge, coupled with his natural ingenuity and a keen insight in mechanical principles, made it easy for him to grapple a mechanical problem and to find a satisfactory solution of it. His successful business life was marked by the same traits and disposition as characterized his private life, and won for him a high position in the confidence, respect and esteem of those having dealings with him.

When the machinery manufacturing business of Penfield & Son was merged into the American Clayworking Machinery Company, the esteem in which his experience and ability were held was shown by his election as President of the new corporation, a position which he held at the time of his death.

By his death the clayworking fraternity lose one of their



J. W. PENFIELD, Deceased.

most capable and progressive members, a man of high ability, sterling integrity and irreproachable character. His loss will be deeply felt, not only in his own community and home, but by a large circle of acquaintances all over the country and in the councils of the craft of which he was such an honored member. May the record of his life inspire others to follow in his footsteps and to emulate his industry, enthusiasm and enterprise, as well as his broad, noble and philanthropic character.

BRICK AND LOVE.

In the British Museum the shelves contain thirty-nine miles of books. The Museum also possesses the oldest love letter in existence. It is a proposal of marriage for the hand of an Egyptian Princess, 3,500 years old. It is inscribed on a brick. The beauty of such love letters was that they could be kept to throw after love grew cold.—Ex.

Written for the CLAY-WORKER.

THE POTTER'S ART.

BY W. PERCIVAL JERVIS.



PRIMARILY THE OBJECT of this and the following papers is to describe the various processes in the manufacture of pottery, but the articles will take a somewhat wider sweep, for of what use would it be to describe the manufacture of a beautiful piece of ware if we are ignorant of the traditions of the art it exemplifies? We may admire the general effect of some magnificent building, but probably could not tell why it pleased us, unless we had some knowledge of architecture, just as the architect himself could not have conceived and carried it out had he not studied the methods of its noblest exponents in the past. But, possessing the knowledge, the noble thoughts that have found expression in massive battlements or delicate tracery are understood, and we can analyze and give an added zest to our appreciation.

It is so with every branch of art, nay, with life itself. The first glamour that surrounds the one we love may never fade, but it is the intimate acquaintance with and knowledge of those qualities we most admire that make love immortal.

—Who Made the First Pottery?—

This question never has been and probably never can be sat-

isfactorily answered. But to return to our subject. It seems reasonable to suppose that primeval man, confronted with the necessity of having vessels to hold liquids, daubed over wicker baskets with clay or lined the inside of a net and dried them in the sun, thus producing the first pottery. Accident, perhaps, or the growth of intelligence, discovered the use of fire, and another important step was made.

As these papers are intended for the general reader rather than the pronounced enthusiast, technical terms will be sparingly used, though it is hardly possible to altogether avoid them. But a little careful study of some of these terms will make the whole intelligible. Many are so distinctive as to suggest their meaning without explanation.

The component parts of any kind of pottery, when mixed together, are termed the body or paste. The latter word is used principally on the continent of Europe, as, for instance, *pâte tendre*, soft paste. This is, however, a misnomer, and Brogniart, the eminent French authority, classifies it as hard porcelain, the glaze being softer than the body. In England the term body is almost invariably used.

Faience is a much abused word. It is probably derived from Faenza, in Italy, one of the early places in that country where earthenware—or majolica, as it was termed—with a stanniferous enamel, was made, and from where the process drifted to Normandy and other parts of France. Until quite recently the word was used in France in a generic way to apply to any kind of earthenware, much the same as the word *delf* was used in England. More recently there is a disposition to apply it



PERUVIAN POTTERY.

only to ware with a stanniferous enamel, and as such it will be employed here. It is not necessary for our purpose to go into the divisions and subdivisions of pottery, and, broadly, we may divide it into three simple classifications:

1. China or porcelain.
2. Earthenware.
3. Stoneware.

The origin of the word porcelain is a much disputed point, but it is probably derived from an obsolete Portuguese word, *porcellana*, meaning a shell. China is, of course, derived from the country of its origin. It is of two kinds—hard or natural, and soft or artificial. Hard porcelain consists of two substances only—kaolin (china clay) and petunse (china stone). Both are feldspathic rock in different states of decomposition from the action of water. In the china clay the alkaline silicate is removed, and the silicate of aluminium remains in a hydrated condition. If the decomposition is not complete, and the feldspar retains some of its alkaline silicate, it then constitutes china stone. This alkaline silicate is a very fusible substance and imparts the translucency and gives to the china its vitreous character. Chinese, Japanese, French and German china all come under this heading. If you take a broken frag-

isfactorily answered. Without leaving our own shores, in ages so remote that the Incas seem but as the children of yesterday, the art was practiced, and we are continually being confronted with the evidences of it. If we read this evidence correctly, it goes far to prove that here was the center of civilization; here was the old world that men of to-day call the new. If we have the evidence of this antiquity, of a time so remote that the mind fails to grasp its extent, there are others and more recent of which nothing remains but a memory. A striking example of this is that highly perfumed pottery made by the monks of Chili and the Aborigines of Southern America, known as the Noble Buccaros, and which those indefatigable traders, the Portuguese, in the sixteenth century, imported into Spain, Italy and Portugal. Its perfume was so subtle, so unlike any known essence, that that alone gave it a reputation denied to more artistic productions. Only slightly fired, the broken pieces were easily ground into powder, and were prescribed as a cure for all the ills that flesh is heir to. Small pieces were mounted in gold and silver, and were more highly esteemed than precious stones. As a climax, it was asserted and believed that a systematic course of eating it would turn a negro white. Equally ridiculous theories were in vogue when Chinese porcelain was first introduced into Europe.

ment of any of these porcelains you will find that, unlike soft china or earthenware, the glaze, which is made almost wholly of feldspar, is hardly to be distinguished from the body. Both have been fired at the same temperature and the whole is perfectly vitrified. Soft or artificial china is composed of a variety of materials, with which we shall deal later on. If you will apply the same test you will find the glaze line clearly defined, while the body itself is not so highly vitrified. A simple test



PREHISTORIC PITCHER NEW MEXICO.

A ZANI CANTEEN.

is to touch the piece with the tongue, and the hardness can be estimated by the time taken to absorb the moisture caused by the contact.

Under the head of earthenware must be included the majolica wares of Italy and France, the white granite and semi-porcelain of to-day, and all opaque bodies not fired high enough or capable of standing sufficient heat to produce vitrification. Stoneware is an opaque vitrified body, varying in fineness from the common butter crock to those exquisite specimens produced by Doulton, and which, from their artistic treatment, rival the best products of the home of stoneware—Germany.

As we have already seen, the simplest kind of pottery is the hard porcelain of China, etc. All other pottery above the grade of yellow ware is composed of a varying number of ingredients. The potter, from long experience, knows the exact proportions required, their action when mixed together and subjected to the fire, and prepares his mixture accordingly.

Clays suitable for pottery are found all over the United States, those chiefly used coming from Delaware, Pennsylvania, Florida, North Carolina, Kentucky and Missouri. Others of good quality are known, but, lying far distant from the centers of manufacture or from the railroad, are not at present available. China clay is also imported from England. This is found in Cornwall, and is washed where it is mined. The clay is placed on an inclined plane, on which water can be poured, and is washed down into a trench, and from there into a succession of pits, in which, successively, the impure ingredients are retained, the water, laden with the finer particles, running into tanks and there depositing its fine silt. It is then partially dried, cut into blocks and shipped to the potter. Nearly all the small streams are impregnated with these clay particles, and the appearance of the country is to the traveler strongly suggestive of "a land of milk," if not of "honey."

The Japanese have a different method of preparing the clay, reducing it to powder by a horizontal balancing pounder worked by water power. The primitiveness of its construction is noticeable. Two beams, joined by an iron crossbar at one end, with a trough at the other, are erected by a stream, so that the water will fall into the trough. The weight of water carries the trough down, and the other end is raised to a corresponding height. On account of the slope the water runs out, the iron-shod bar descends, and in a short time pulverizes the clay. It is then sifted and decanted and the water finally drained off through sand and matting, leaving the silt on the mat.

Ball or marl clays are dark in color, and are employed as a base for the strength and plasticity they give. In addition to these two clays, there are other ingredients necessary. Flint is used to whiten and make the clay porous, and feldspar to consolidate and close the pores of the clay, like a glue. The use of flint was discovered by John Astbury in 1720, a discovery the importance of which cannot be overestimated. It is not too high a mead of praise to say that Astbury made possible the improvements effected in English earthenware by Josiah Wedgwood thirty or forty years later, just as the Grue family, in the eighteenth century, by the employment of fine artists in the Castelli factory, paved the way for those beautiful specimens which, a little later, were produced at Capo di Monte.

The first step in the manufacture of pottery is the preparation of the clay before it is given to the potter. Having been mixed with water, the clay is placed in what is called a blunger, a circular tank with an upright shaft with projecting arms, and as the blunger revolves the clay is thoroughly mixed and reduced to the consistency of cream. It is then technically known as slip, and is run off into a tank called an agitator, where it is kept continually seething. It is then strained through bolting cloth into another tank connected by a trough, in which are a number of powerful magnets, which extract any iron particles that may have passed through the lawn. To separate the water from the clay it is next forced through a filter press, but it is still full of air bubbles, and must go to the pug mill. This is either an upright or horizontal cylinder, in which is a shaft with knives attached, which cut and mix the clay, and, being forced through a small aperture, drives out the air bubbles, and the clay is ready for the potter.

The word "slip" always reminds me of the story of three prominent, though somewhat illiterate, English manufacturers, who, off on a jaunt, agreed that the first one who "talked shop" should pay for the dinners. By a great mental effort the forbidden subject was avoided until nearly the conclusion of dinner, when one of them, struck with the fine quality of the cream, remarked: "Eh, mon, but it's as thick as slip," a tribute to its quality which not only gives an idea as to its consistency, but cost him the dinners.

Before machinery came into use the clay was prepared by men treading it with their feet, the best, if the most laborious,



GERMAN BEER MUG, Villery & Boch.

LAMBETH DOULTON.

method, and still occasionally used in France when some special piece is to be made.

The potter's wheel, with some little history of its antiquity, and its successor, the jigger, will bring us in our next paper to a very interesting part of our subject.

ONE WAY.

"I sent a dollar last week," said the Good Thing, "in answer to that advertisement offering a method of saving one-half my gas bills."

"And you got?"

"A printed slip directing me to paste them in a scrap book."
—American Druggist.

THE MENDOTA TILE COMPANY.

This company was established in April, 1883, by George Stare, Wm. Traves and George Kohr, of Decatur, Ill. At the end of the first year George Stare purchased the whole plant for \$11,500, and thereafter it was run and controlled by his son, Wm. Stare, until April, 1892, when the latter became sole proprietor, adopting the firm name of the Mendota Brick and Tile Company. An average of 650,000 tile have been made each year since they began operation. They have one shed 24 feet by 340 feet and one 24 feet by 228 feet, one story; engine, boiler and machine room of 40 by 60 feet. The clay is hauled from bank by engine, on cars which have a capacity of about one ton of clay. They have three tracks running full length of each shed, and use cars 12 feet long and 2 feet wide to transport tile, and one man is required to do all the handling of tile made on these cars. Last year they made brick, and have a very excellent building brick, also sidewalk and paving brick equal to any paving brick made. They have put in three new kilns and built a smokestack this spring, and hope to make as good pavers as are made anywhere. They sold their entire output of building and paving brick last year, and expect to increase this output this year as the outlook for trade is very encouraging.

Written for the CLAY-WORKER.

THE BRICKMAKER'S GRAVEYARD.—No. 2.



—The Experimental Stage.—

ANY SETTLERS in the silent town site laid out and owned by the brickmaker located there because they were still-born or deformed from birth. They were not constituted, designed and built to survive amid the surroundings in which their lots were cast. They were the products of inventive but impracticable brains. They had original and interesting peculiarities, but were devoid of practical utility. Any one who has studiously read the advertisements and looked at the illustrations in detail of new machines that have appeared from time to time in the pages of the Clay-Worker has been impressed with the thought that many never survived the experimental stage. He who walks through the brickmakers' graveyards will find, many a time and oft, the sad reminder of the impractical ideas of the inventor and manufacturer of clayworking machinery. These same remains bring sadness to the hearts and pockets of the brickmakers as they are reminded of the time when they had more faith in the representations and enthusiasm of others than their experience and mature judgment would justify. It takes shrewd sagacity, guided by practical experience, to discern the merits and demerits of a new invention. Many overconfident men

have bought machines of new design that at first seemed to be admirably adapted to the work for which they were intended, but which failed to stand the tests of practical experience.

The custom of buying machinery on trial has resulted largely from the disappointments of those purchasers who had not the mechanical acumen to judge a machine without the aid of practical tests in their own works and with their own clay. Buying and selling machinery subject to approval after trial seems hard upon the maker, and yet it is probably the best for him in the end. In justice to his reputation he should not allow his machinery to go into places where it will be a constant source of dissatisfaction. His future sales depend largely upon the success of those machines already sold. He knows better than others what his machine will do and where in it is likely to fail. Knowing that it goes into use in new places subject to trial, he will exercise his judgment and will not put it in where he thinks it will fail.

The brickmaker incurs considerable expense, both of money and time, in testing a new machine, and should be spared this expense in trying those machines that are likely to prove unsatisfactory. He is not supposed to fully understand the peculiarities of new styles of machinery, and should have some means whereby he could protect himself against the probabilities of disappointment in trying new machinery whose only commendation is the representations of overconfident and interested representatives. The man or firm who sends out new machines that have only been on trial for a short time and under limited conditions, and does not stand ready to make them give satisfaction, does gross injustice to himself as well as to his patrons.

The machine salesman whose highest ambition is to book orders and who has no interest in the future success or failure of the machinery that he sells has mistaken his calling. He belongs in the lightning-rod business. The permanent success of manufacturers of clayworking machinery can only be attained by manufacturing and placing upon the market machinery that is itself successful. In all cases where machinery is not satisfactory the makers should be as anxious as the user to take it out and substitute something else that will be successful. The firm who will knowingly allow one of their machines to remain in a plant where it is not giving satisfaction is either dishonest or too poor to do what is right and just towards their patrons. If honest and poor, they will retire from business without inflicting their incompetent outfits upon others. If dishonest, they should be arrested and tried for obtaining money under false pretenses.

—An Orphan's Grave.—

There is a temptation for manufacturers of clay machinery to sell their machines and collect the price with the least possible trouble. They should see that the purchaser fully understands how to set up and run his machine. He should be



WORKS OF THE MENDOTA BRICK AND TILE CO.

thoroughly instructed as to possible difficulties that may arise and the methods of overcoming them. The machine man who ships his things out into the world without brooding over them and watching them for a time is as devoid of the maternal instinct as an incubator. A good parent will go with his child when he starts to school. He will tell the teacher how to manage the child. The man who wants his machine to be marked one hundred should go with it until the new managers understand its peculiarities. Strangers are often kind-hearted and patient, but no one can understand a child as the parent does. Many machines have been run at a disadvantage for years because the maker failed to get them started right and the purchaser supposed that was the best they could do; supposed that he had them in as good order as was possible. A machine that labors under such disadvantages is liable to die young and fill an orphan's grave.

The man who neglects his children and runs away from them in his haste to gain riches will find a large, stony sin of neglect rolled before the door of his grave that will be very hard to remove when he attempts to arise. He who hopes to build up a profitable business by simply selling machinery, and making machines to sell, will soon learn that purchasers will buy those machines that give best results in actual work, and unless he is willing not only to sell his products, but to go with them and make them do the work expected of them by the purchaser, he will surely meet disappointment. The practice of giving testimonials has led intending purchasers to investigate the records of the machines they contemplate purchasing. The offers of sale upon trial have removed much of the uncertainty formerly attending the purchase of a new machine.

—Broken Down.—

Many machines have been set out in the graveyard plant because they broke. If they broke because the part was not made large and strong enough, that part should have been strengthened. A machine should not be condemned nor abandoned because it has a weak place. We all have our weaknesses and soft spots. By exercising patience and judgment such a machine may soon be made to do good service. Often a machine is broken by being fed on too strong diet or improperly prepared food. Those who have had to deal with plunger machines know the difficulties that follow the use of clay that is too dry and stiff. Plunger machines are designed to work clay that is properly pugged and that is moist and soft enough to flow under pressure something after the manner of liquids. It is manifestly unjust to the machine and its maker to require it to work hard, stiff clay "or bust." Any intelligent lump of animated clay should know that hard, stiff clay will not work that way, and as a consequence the machine will bust. The digestion of a brick machine is not like an ostrich, and will not take care of broken glass, stones and clods; neither does it relish nor require cast-off clothing as an article of diet, as does the billy goat.

The brickmaker who expects his machine to make good brick of poor material would make a first-class pagan. He shows that blind, ignorant faith that worships idols made by human hands.

There is a cause for every breakage that occurs. When a part breaks it is not enough to find the broken place and repair it. This only places the machine in the condition it was before it broke. Under the same conditions it may break again. The cause of the breaking should be discovered and removed.

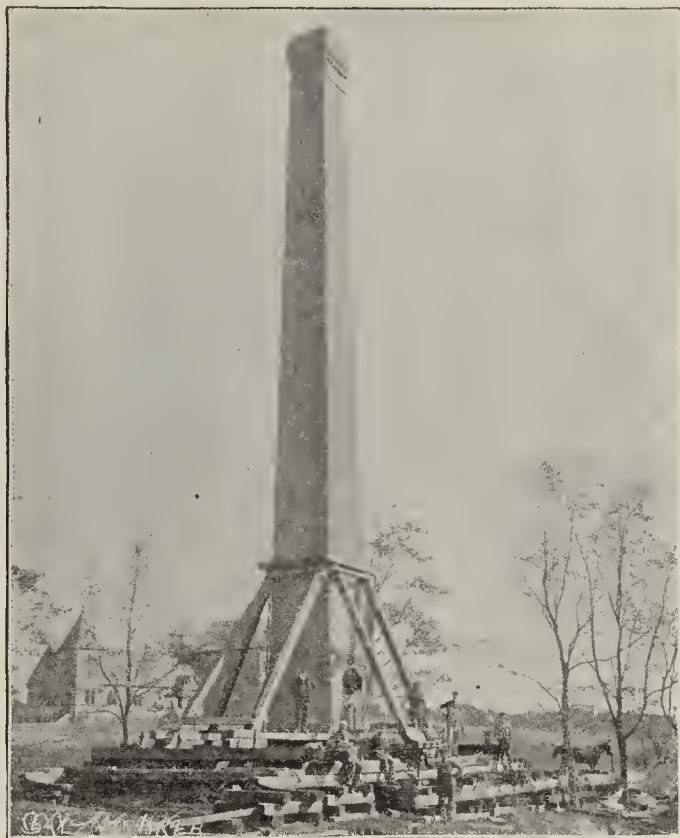
—Run Over.—

In successful, growing plants it is no uncommon thing for machines to be thrown out because they are too small for the present needs. They were too slow for the time and place in which they lived. It was no fault of theirs. They did the best they could. They could not keep up with their surroundings, and were run over. The wheels of progress ruthlessly crushed out their lives and they were borne to the rear and laid away. The misfortune was that they were ever placed in those conditions. Had the designer of the plant been far-seeing enough to appreciate the circumstances and anticipate the future the calamity might have been avoided. Unless they have been worn out in the hopeless attempt to keep up or too

badly broken by the trampling hoofs and grinding wheels of the chariot of progress they should have been given positions in new fields of usefulness where the requirements could be met by their limited abilities.

The "Wanted" and "For Sale" column does a grand work of charity in securing homes and fields of usefulness for the unfortunate. It has saved many a despondent one from the horrors of suicide, has given comfort and that independence which comes from self-support to many who only needed positions less irksome, and has placed many an unfortunate in the hands of kind friends who understood their peculiarities and who would bear with their infirmities.

Another class of poor old antiquated superannuates may be classed with these, namely, those that have been supplanted by improved labor-saving devices that do the work more rapidly, better and at less expense than they. They may still be strong and amply able to do the work for which they were calculated and built, and would plod along as industriously as ever, but their gait is too slow, and, in spite of their faithfulness, they must be left behind. The only hope for them is in moving to some of the back counties. The "Wanted" and "For Sale" column is a kind of an immigration bureau that may help them to the rear, where they will be safe. Should



MOVING A TALL CHIMNEY.

this fail them, they will doubtless be left by the wayside, die of neglect, and finally reach a last resting place in the potters' field.
(To be continued.)

GOOD WORK IN CHIMNEY MOVING.

The accompanying illustration is made from a photograph which represents the recent successful moving of a large chimney owned by the Manhasset Improvement Company, at Manhasset, Shelter Island, Suffolk county, New York. The chimney is eighty-five feet high and seven feet square at base, with outer and inner walls eight inches thick; it weighs nearly one hundred tons. It was moved about 950 feet, over very rough ground and quite a grade, both up and down. The picture shows clearly the construction of the cradle trusses, etc. The eradle rested on two skids, greased on the under side and sliding on greased blocks. The purchase used was a chain capstan and one horse at 180 fold, and the time occupied in loading and moving was only nine days, with the labor of only four men besides the contractors, W. H. & C. P. Topping, of Bridgehampton, N. Y. The chimney was placed on its new foundation without a particle of harm. This is the second chimney of the above description moved by the same contractors. The first one was fifty-two feet high, at Bridgehampton, and in both cases the work was completed without accident.—Scientific American.

Written for the CLAY-WORKER.

THE BEST BUILDING, THE BEST BRICK AND THE BRICKLAYING.

BY J. W. CRARY, SR.



ONE OF THE MOST important things in the economic conditions of our country is good building and cheap insurance. It is said that over \$300,000,000 is paid out of the pockets of the people every year to insurance companies for risks on buildings.

Whether it be more or less, it seriously involves the question of good building. It is safe to say that at least one-half of the cost of insurance could be saved by better building.

—The Policy of Insurance Not Generally Understood.—

The average person thinks that only the person who pays the cost of a policy of insurance is concerned in the matter, when, in fact, the burden of cost falls indirectly on the whole community. A little thoughtful consideration shows this fact. The manufacturer pays insurance, the wholesale merchant and shipper pays insurance, the retail merchant pays insurance; so at least three distinct policies of insurance are paid by the merchants for their goods. All this cost is added to the retail price of their goods, and, of course, the burden falls on the consumer.

—Cost of Insurance on Buildings.—

A large proportion of all buildings are insured, and, whether stores or dwellings, the cost of insurance falls on the community at large. True, the underwriters collect only from the owners of the buildings, but the owners charge the cost to the tenants; it is added to the rent. The tenant pays it, and it is a part of his current expenses, and whatever may be his employment, he necessarily, though indirectly, charges it to his employer, so that the policy of insurance is a circle, affecting all parts, from the center to the circumference. It is simply one vast system of constructive co-operation, an "endless chain," that cannot be broken where civilization and commerce exist. If the present system of insurance were destroyed, and every man left to take his own risks and assure himself, the result in cost to the community would be the same. If a man insured his property himself he would charge the item to the user or consumer of it, and the community would be affected just as it is now, excepting the greater liability to individual loss.

—The Present Question Is, Good Building Against Bad.—

As to wooden buildings, no respectable builder or architect will propose them where there is liability to fire. As to stone buildings, they are not only too expensive, but are undesirable as dwellings or storehouses, and are not fire-proof. As to iron, it is too expensive; it is liable to rust, and is not fire-proof; it will warp or melt in any common fire. Iron should be used in house building only as girders, anchors or fastenings in brick walls, and then it should be prepared so as to prevent oxidation. No kind of metal can be made a profitable building material. Steel "sky scrapers," veneered with brick, are the latest fad and fallacy of builders and moon-eyed architects.

Brick is the only building material we can trust. Neither time or its destructive elements have ever told any fault of a good brick. From the most ancient ruins of cities to the latest fires, all good, well-made and burned brick have stood the tests, with the highest honors, for efficiency and durability.

—The Good Brick House the Best and Cheapest in the Long Run.—

For instance, fifteen hundred dollars will build a first-class six-room brick house; twelve hundred dollars will build a first-class six-room wooden house. The life of the wooden house without repairs will not exceed twenty years; the cost of insurance and repairs, twenty years, \$980; cost of insurance and repairs of brick house, twenty years, \$500. At the end of

twenty years the wooden house is not worth over \$600 and the brick house is worth its first cost—\$1,500. So the brick house is \$580 better than the wooden house, and in ten years will still be worth \$1,500, while the wooden house will be worthless. This is not an exaggerated statement of the advantage of brick building over wooden building. I have said nothing of the cheaper rates of insurance for goods in the brick house, and other advantages that accrue to its tenants.

—The General Public Has a Right to Demand the Best Kind of Building.—

Health, fires, storms and cost of insurance are potent considerations, and the public has a right, and duty, in seeing that buildings shall be of the best kind in all respects. Plans and specifications should be made so as to direct the best kind of building, and competent public inspectors should be strictly ordered to see that no defective planning or building shall be done. One bad building may cause the destruction of much life and property, either by fire, storm or pestilence. The best brick, well laid, is the only safe, sure and profitable building material for all public, or even private, buildings. Brick for all walls, iron for girders and fastenings, and terra cotta for floors and trimmings may be used with the very best results.

—Importance of Good Bricklaying and Good Mortar.—

I have written often and talked a good deal on this subject. The brickmakers, and especially the builders, do not properly appreciate the laying of brick. They may be careful to get the best brick, but, when it comes to laying, the practice is to let the work to the man who will do it cheapest, or else employ men who will lay the most brick, regardless of workmanship. If the walls are straight, plumb and level, and look well on the outside, the "boss" is satisfied. The architect has given it a mere superficial inspection, and the owner depends on his architect. So there is no responsible supervision of the work, and if the walls crack or fall the fault will, perhaps, be charged to the brick.

—The Way to Have Good Building Done.—

First—Employ a good, thoroughly well qualified architect or civil engineer, as the case may require. Let him make his plans right and his specifications clear and explicit. Then give him full authority to have all the work done according to plan and specification.

Second—Hold the architect strictly responsible for the full, honest performance of all the work, and then act as detective yourself or else get a reliable, competent person to watch and see that your work is done in good faith, as per plan and specification. It is much better to have brick laid by day's work; then the "boss" bricklayer, or foreman, has no interest in slighting the work.

About all United States government work is done in this way. Uncle Sam contracts for materials, but scarcely ever for workmanship. The bricklayer should have time to spread his mortar well, and then completely "bed" his brick, and do his work with a view to quality first, quantity second.

—All Party Walls Should Be Substantial and Fire-Proof.—

The outside courses of party walls should be of cheap grade fire brick, and should be set off from the inside at least half an inch. In case of fire the half-inch aperture acts as a non-conductor, and the wall will not be heated to the center so as to curve or "buckle."

SIoux CITY WANTS A PAVING BRICK PLANT.

She Has a Number of Streets to Pave, and Wants to Use Brick Made at Home.

Sioux City, Ia., is a progressive town, and, being alive to the importance of good streets, her Councilmen ordered the City Engineer and the Chairman of the Paving Committee to have some sample paving brick made by local manufacturers, tested by City Engineer Thompson, of Peoria, Ill., at the municipal testing laboratory in that city, for the purpose of comparing the home product with that of Galesburg and other points. The results were quite satisfactory and demonstrated that a first-class paver can be made from Sioux City clay.

The demand for paving brick in that section bids fair to be very large, so that the establishment of a modern plant there will no doubt be chronicled in the near future. It is a good point for any one desiring to invest. Mr. Thos. Green, Manager of the Sioux City Building Brick and Tile Works, will be pleased to correspond with any one wanting further information.

BUTTON-HOLE TALKS.



"HERE, YOU, GATES! Look here a moment! You are the fellow that has always been kicking about his picture in the Clay-Worker, are you not?"

"Well, Randall never has made you look much like a professional beauty, I will acknowledge; still, I think it one of those cases where 'The least said the soonest mended,' and if I was in your place, wearing that Roman horn you wear and carrying that hungry look you carry, I really would not attract any more attention than I could help.

"What do you expect the poor man to do, anyway? You insisted on sitting for the picture yourself, didn't you? If you want a real good picture for publication there is really only one way in which you can get it certain sure, and I don't mind telling you that way is to get me, or some other well-put-up and accommodating friend, to sit for you. If you insist on posing yourself, you will never be satisfied. Why, Randall has tried it faithfully time and again—really imperiled his circulation trying it (circulation is the whole thing with him, too, you know, same as circulation of blood is to you). Why, he even had Lederer sketch you characteristically going through your 'Button-hole Talk' business, way back in the times before 'the other fellow' began wearing that dress suit. He got a good picture of you, too, and one that all of us recognized. But he could not please you, because it looked like you, and you really seemed to want one that did not look like you. You better go look in a glass earnestly for awhile, and then maybe you will understand it better.

"If you do, and come to your senses, then some of us fellows will help you out by giving a sitting, or possibly it might be accomplished by taking out the 'Before taking' picture he has had in and borrowing one of the 'After taking' from the 'pill man,' and using that. The main thing that you must remember, though, is that you mustn't keep grumbling, and still insist on sitting for the picture yourself."

Now, Randall, this fellow has always been right in everything else, and so I suppose he is in this, so hunt out Lederer's picture of me, polish it up and keep it handy. GATES.

Written for the CLAY-WORKER.

FIRE-PROOF CONSTRUCTION.

BY R. "BRICK" MORRISON.

WE CLAIM THAT BRICK BUILDINGS are fire-proof, but we are told that brick buildings are destroyed by fire, hence they are not fire-proof. If it were possible to construct a building and use brick exclusively, then it would be absolutely fire-proof, for the simple reason that the material composing the building had been burned before it went into the building, hence could not be destroyed by heat.

We call a structure a brick building if the outside walls are of brick, however light these walls may be. But a building whose outer walls only are of brick, and floors, joists, ceilings, partitions, doors and door frames, windows and window frames, and roof and cornice of wood, comes as near being a brick building as an egg comes to being a doorknob. There are hundreds of hotels in this country posing as brick structures that are simply large wooden buildings incased in a very thin brick wall, with hundreds of rooms supported by wood, composed of wood, separated from each other by wood, and the stories with only a wood floor to divide them. The traveler selects the brick hotel for safety, never thinking that he is to slumber in a vast lumber yard. And yet these monstrous things are called brick buildings, and men are permitted to put up such human traps and fill them from basement to tenth story with unsuspecting guests, and about the only provision made for escape in case of fire is a network of telegraph or

telephone wires stretched alongside the third story. These serve the double purpose of preventing the hoisting of ladders and keeps the victim from breaking the flagstones of the sidewalk when he jumps from his window. Schoolhouses are built on this plan, and hundreds of little children are corraled therein. Places of public amusement are also built on this plan. Human life is held lightly.

In a Southern city, recently, a "brick shell" hotel burned and several guests lost their lives; in another city a business block burned, and here, again, several occupants perished. Does any one think for a moment that such calamities could befall if a building was properly built with brick? In another city a female college, built entirely of wood, took fire. The girls rushed from the burning house in their night clothes, losing all their personal belongings, and one her life, all frightened and shocked beyond measure.

Our legislators worry their brains in the midnight hours and scream themselves hoarse about some bill that is of no practical value whatever to their constituents or to any other person's constituents, and fail entirely to pass a law to protect the lives of traveling men, of school children or college girls



W. D. GATES, Past Grand Button-Holer of the N. B. M. A.

and boys. A great man has said, "A public office is a public trust." A public building should be a public trust.

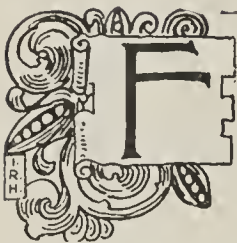
It is high time in this country for us to begin to build for the future, for posterity. A house fifty years old is called an old house in this country, and it is called by the right name, for at this age they are feeble, and bent, and wrinkled, and decrepit, and tottering to their fall.

Our magazines are filled with discussions of almost every phase of human affairs, and yet who has written of proper construction, even of public buildings? Who has written of home building? Where are the great teachers on these lines? They should tell us how to construct a home for our families so that it might be durable, comfortable, beautiful and safe; how to construct a public building that will endure for centuries to come, with strength to withstand every strain to which it may be subjected and fire-proof in every part, insuring the safety of those who intrust their lives within its walls. Our National Association should move out on these lines, and in this way benefit every citizen of our country as well as their own private interests. Let our motto be "Brick houses for brick-makers."

Written for the CLAY-WORKER.

GLAZES.—No. 2.

BY PROF. EDWARD ORTON, JR., E. M.



—The Materials of Which Glazes Are Made.—

FROM THE DIFFICULTIES which were met in the last paper, in giving any exact or clear-cut definition of glasses and glazes, it will naturally be inferred either that the subject is one of great complexity or that the popular ideas are widely at variance from the scientific view of the case. In fact, both suppositions are true. The ordinary glass of commerce is not a difficult thing to understand or to make. But it is separated by no barriers of either structure or composition from great numbers of complex modifications, so that it is impossible to define one without taking cognizance of the others also.

We learned, however, that glasses were silicates, having certain physical structure. But silicates of what? Would one base do as well as another in making a glass? By no means.

—A Practical Experiment.—

Suppose we were to take an equivalent quantity of every metallic oxide which could possibly fall in price within the reach of the glassmaker's pocketbook, and add to each the same equivalent quantity of white sand. Now, after mixing, suppose that each batch were heated independently till fusion ensued, and then each were cooled down in the open air at its own natural rate. What would we have? A series of silicates, undeniably. But glasses? There would be three out of the lot which would exhibit more or less of the glassy structure; all of the rest would be slags of unqualifiedly stony fracture.

The three oxides which form glasses with silica alone are those of sodium, potassium and lead. And of these three, only one is entitled to be called a satisfactory glass, for the silicates of potash and soda, while distinctly glassy in appearance, are not permanent, but dissolve up in water with more or less ease, and become dull and rough even in the open air.

—Lead Glass.—

Lead, then, is the only element known to man whose silicate forms by itself a perfect and durable glass. It is actually used to some extent, particularly as a pottery glaze, without admixture of any other base or other acid than silica, though its cost will always prevent its becoming a competitor of common glass. The silicates of potash and soda, by virtue of their peculiarity as the only silicates which dissolve in water, are usually known as "soluble glass," and they find a very extensive use in the arts as mucilages, cements, varnishes, sizes and mediums for making fire-proof paints and colors.

But let us make another line of experiments. We have found already that potash and soda make glassy silicates, but that they cannot be used alone, because they are soluble, and hence will not resist weather. Let us take the same list of basic oxides as before, but in only one-half of their former quantities, supplying the other half by an equivalent quantity of potash or soda; to these mixtures we add sand as before, mix, melt and cool them. Our products will now be double silicates of lime and soda, or magnesia and soda, or iron and soda, etc., or of potash, as the case might be.

—More Flattering Results.—

Where, in our first trial, we found that lime, magnesia, alumina, zinc and baryta furnished only opaque and stony silicates, we now find that when mixed with alkali they yield clear, colorless glasses of perfect structure and considerable beauty. And with lead, also, while it can make a clear and colorless glass alone, it is found that by replacing a part of the lead by alkali the cost of the mixture has been reduced without sensible loss of quality or brilliance in the glass.

And, looking further among the results of the test, we will find that the double silicates of the alkalis and copper, manganese, iron, chromium, cobalt, nickel, uranium and others are all clear glasses of perfect structure, but are colored by the oxides of the metals of which they are composed. The important thing to be noticed in the preceding is the fact that a commercial glass must be a mixture of two or more silicates, one of which must be necessarily that of an alkali. And as soda is the most abundant and cheapest alkali, and as lime is the most abundant and most easily obtained, pure, of any of the first list of bases given above, it follows that more study has been bestowed on their characteristics and more effort made to develop their good qualities than those of the more expensive ma-

terials. Hence the glasses of commerce are mainly manufactured from these three ingredients—soda, lime and sand.

The soda may be replaced by potash, and in some of the finer grades of glass the lime is replaced by lead oxide, or by lead and zinc oxides. In the manufacture of the various glasses demanded by the modern needs of optical and chemical work, the glassmaker must needs become a chemist, and there are no oxides or acids which have not been tested for their applicability to these uses.

—Our Glass Is Nearing Perfection.—

The results of this vast quantity of experimental and practical work, however, have shown more conclusively that modern practice has reached the limits within which extension is probable, and that the typical glass of to-day will be the typical glass of the future as well.

The interesting thing to note in this story of the synthesis of a glass is in the fact that it is only by the union of two compounds, both unsuitable alone, that we obtain a suitable product. The one silicate alone is glassy but soluble; the other silicate alone is insoluble but stony; the mixture of the two is glassy and insoluble.

I say insoluble, but I mean it only in its ordinary practical sense. One can boil a glass bottle in water for a day without making any apparent difference in it, but a little has been dissolved, after all. All chemists know that the glass of their utensils is really always dissolving more or less and entering into their analyses in minute quantities, and that these errors sometimes combine to form appreciable amounts.

The German glassmakers, with the thoroughness which characterizes all their work, have shown that when glass is pulverized to an impalpable powder and boiled with water its rate of solution becomes very much more rapid, and that no glass is wholly insoluble. They have shown, also, that glass yields to solution by water and acids in proportion to the amount of alkaline silicate which it contains; that is, a glass containing a high per cent. of soda and a low per cent. of lime would dissolve much faster than one containing low soda and high lime. When you see a pane of window glass which is dull and cloudy, and which will not remain bright for any time after cleaning, it is likely to be due to too much soda in its make-up.

—Glassmakers No Longer Secretive.—

As before stated, the glass of commerce is very largely a lime-soda silicate, and so general has become the use of these reagents, and so well established has everything connected with their proportioning and mixture become, by the vast amount of experiment and practice of the past, that this department of glassmaking receives but a small share of the skill and attention of the glassmaker of to-day. His brain is busied with problems of new forms and new designs and new markets for his ware. He even has gotten to the point where he ceases to be secretive or mysterious as to his "batch," as he calls the proportion of the ingredients which he uses, and this information he willingly shares with his competitor, regarding it as not worth the trouble of concealment.

—If Glassmaking Is Easy, Why Not Glazemaking?—

Would such a lime-soda glass answer satisfactorily as a pottery glaze? Hardly. And why not? As stated before, in the first paper, the differences between glasses and glazes are primarily those of use, not of composition. The glass which is to be used as a glaze must be suited in melting point and co-efficient of expansion to the ware on which it is to be melted. There is no chemical reason, then, why window glass might not be ground up to dust and applied as a pottery glaze? None at all. It is possible to conceive of a clay body on which such a glass would "fit" and make a perfect glaze, though in general cases it would be entirely unsuitable. The uses to which common glass is put do not require a wide range in fusibility or any special rate of contraction.

It has been found, in fact, that wide ranges of composition are not permissible in good glasses; that it begins to develop certain physical defects as soon as these comparatively narrow limits are passed. For instance, if a glassmaker begins to cut down his proportions of soda and lime, his glass soon shows it by becoming cloudy and crystalline. In other words, his glass devitrifies, and begins to assume a stony nature. Also, if he tries the reverse process and cuts down his sand, in order to save fuel in melting, he attains the last object, but soon notices that his glass becomes watery and thin, and very difficult to blow or mold. It is either too fluid or too solid, and never assumes the taffy-like consistency of good glass when it is ready to blow. The rate of expansion also changes in each case, but this does not matter to a glass, for each piece is free to contract or expand at will.

The narrow limits of composition thus imposed, of course, require a narrow range of temperature in finishing; hence it may be truthfully said that glassmakers use substantially the same ingredients, the same proportions and the same temperatures,

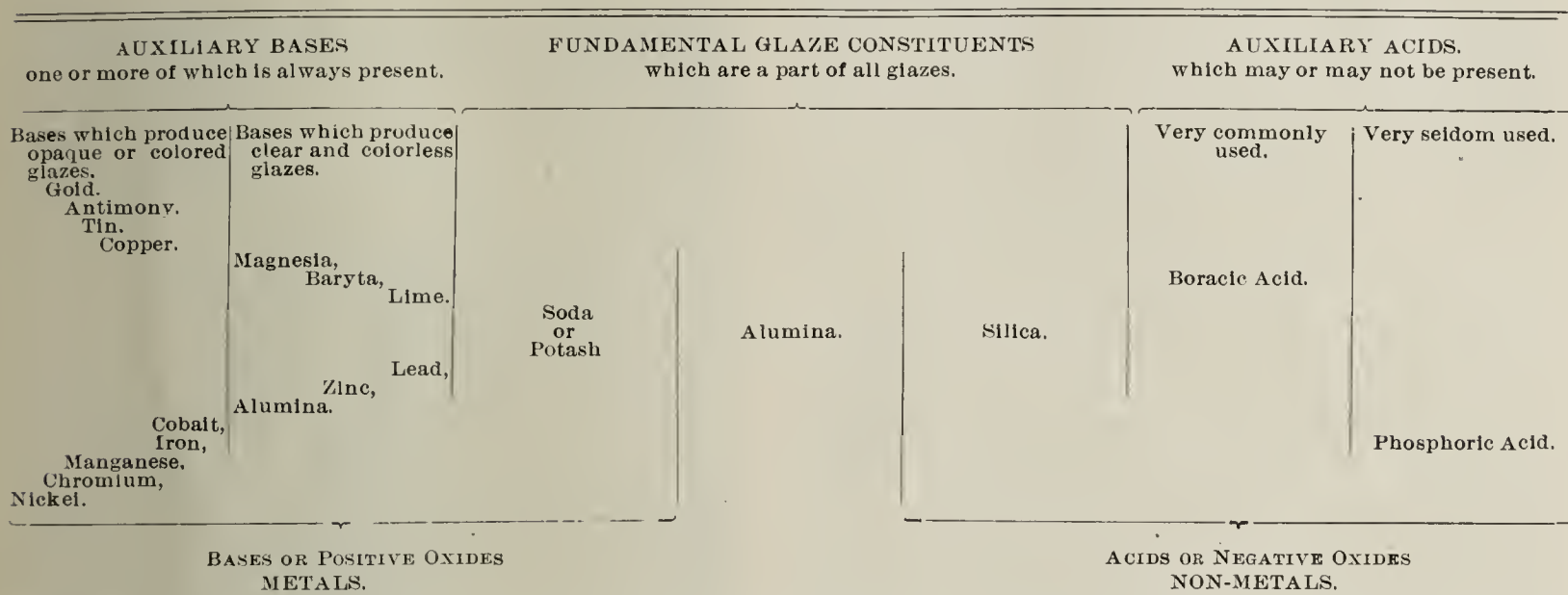
and that they are practically restricted to these conditions if they wish to attain good results.

—It Is Different with the Glazemaker.—

But with the glazemaker all is different. The bodies on which his glazes are to rest are each different, and are themselves variable. Each glaze must melt at temperatures suitable for the body; it must contract and expand in harmony with it. These differences in physical properties can only be obtained by varying the chemical structure. He must be able to use different materials for different ends, and must have an accurate knowledge of the effect which each addition will have on the physical properties of the glaze. So it can now be seen that the same conditions which limit a glassmaker to a few elements and to small variations in their proportions force the glazemaker to employ a wide range of chemical elements and great variations in their proportions in his efforts to adjust his glaze to his wares. The total list of possible ingredients for glaze-making falls but little short of the number of elements known to man, but in practice questions of cost and convenience have really limited it to about twenty of the most abundant.

To illustrate these in a graphic way they have been grouped in the following chart so as to show something of their functions and relative importance:

CHART SHOWING INGREDIENTS OF GLAZES.



As will be seen, the elements are grouped by the lower brackets, into chemical subdivisions, as acids and bases, while the upper brackets divide them up according to their importance to the glazemaker, into those which are fundamental and those which are auxiliary or elective. The bases are represented as starting from the center with the alkalis, which are essential elements, and from there diverging in two lines of equal importance. Thus, immediately behind the alkalis, come lime in one line and lead in the other. It is hard to give either of these the precedence over the other; in very soft glazes lead is used without lime, and in very hard glazes lime is used without lead; in the vast majority of glazes both are used, and hence they are placed as being of equal importance. The other bases follow in pairs, their importance to the glazemaker being indicated by their distance from the center of the line.

On the opposite side are arranged the negative or acid compounds. As will be noticed, there are but few of these, the reason being that the other common acids are all volatile or decomposed by high heat, and only these will remain at the glaze-forming temperatures.

—The Position of Alumina.—

Attention must next be called to the position of alumina as the intermediate member of the glaze. From its position it would seem to be the central point of the whole structure and the nucleus of all. But such is not the case; it is placed here to show a very curious fact, viz.: that in most glazes, particularly the softer ones, alumina does not appear to act as either an acid or a base to any perceptible degree. For instance, its effect in soft glazes is to increase the melting point, which is like an addition of silica, yet it is known that it is incapable of acting as an acid alone in the production of a glaze. Also, in some hard-fire glazes, it does act distinctly like a base, and for that reason it is included a second time in the list of bases, next to zinc. But it generally seems to be very nearly neutral, and its constant presence in glazes is due to its power to correct one of their commonest physical faults, which will be thoroughly discussed later on.

—The Glazemaker's Store Room.—

Such, then, are the ingredients at the glazemaker's command. From these chemical elements the rarest triumphs of the ceramic art are achieved. Surely it may be justly claimed that the potter starts with that which every one else spurns, and from it fabricates that to which all must do homage.

It must not be supposed that it is meant by the above chart that the bins of the glazemaker's storeroom are filled with chemicals corresponding to the above list of names. In fact, since all common acids are expelled from their bases by the heat of a glass kiln, except the three employed above, it follows that we may use almost any salt which we wish to use, and expect that its acid will be replaced by the silica and boric acid of the glaze. Hence we use very many kinds of minerals and salts as raw materials for glazes whose composition in our storeroom bins is very different from its final shape in the glaze, and in selecting our ingredients we generally are guided by questions of their cost and purity, rather than their present form of combination.

For instance, if we wished to use lime in a porcelain glaze, it would be immaterial whether we used it as a carbonate or a sulphate or a hydrate or as an oxide, providing that all of these forms were equally free from other metallic oxides. If

we want fifty-six pounds of lime in our glaze when burnt we would simply have to weigh out fifty-six pounds of fresh quicklime, or seventy-four pounds of slaked lime, or 100 pounds of carbonate of lime, or 136 pounds of sulphate of lime, and we would get the right quantity in each case. The difference between what we weigh out and what we get in the glaze is represented by water, and carbonic acid, and sulphuric acid, in the last three cases, respectively. The lime goes into the glaze as calcium oxide in each case, weighing just as much per atom from one compound as from another.

—The Source of Much Mysticism.—

The different forms in which chemical compounds can be added to glazes have been the cause of much of the mysticism which has hung around this subject so long. You will hear men gravely discussing the relative advantages of white lead vs. red lead in a glaze, when, as a fact, it makes no earthly difference which is used, if each is equally free from contaminating oxides. We must try to look at glazes as being composed of chemical elements or compounds which are always the same, and to look at the substances from which we get them merely as the ores from which these elements are to be derived. When one once gets this point of view thoroughly established the subject begins to look much more simple. The commercial sources from which the principal chemical elements used in glazes are customarily obtained for the glassmaking and glazemaking industries are given below.

—The Acid Elements of the Glaze.—

Silicic acid (SiO_2) is obtained, as such, in a great variety of forms. The principal ones are white sands, quartz sands, crushed sandstones, quartz, quartite, flint and infusorial earth. It is also constantly added to glazes in the form of silicious minerals, like feldspars and kaolins, which are used in the glaze on account of some other ingredient which they contain. These latter are added first, and the amount of silica still required is made up by addition of some one of the first named forms.

Boric acid (B_2O_3) is obtained in the market as borax,

which is a bi-borate of soda, or as boracite, which is a borate of magnesia, or as artificial borate of calcium, or as tincal, which is a crude borate of soda, or as the pure, refined, flaky boracic acid of commerce.

Phosphoric acid (P_2O_5) is almost wholly used in the form of calcined bones, which are a nearly pure phosphate of lime. The mineral phosphate of lime is generally impure, and cannot be used for that reason.

—The Basic Elements of the Glaze.—

Potash (K_2O) is obtained very largely from orthoclase feldspar, or "spar," as it is called in the trade. This is a silicate of alumina and potash, yielding about 14 per cent. of potash. A weaker material is Cornish stone, which is a partly decomposed feldspathic granite, yielding about 6 to 8 per cent. of potash. As both of these minerals carry larger per cents. of alumina than they do of potash, when one wants to make a glaze high in potash and low in alumina he finds it necessary to resort to saltpeter, which is a nitrate of potash, or to pearl ash, which is an impure carbonate, formerly derived from wood ashes, but now made in large quantities from a mineral called carnallite.

Soda (Na_2O)—Soda is most abundantly used as borax, or the bi-borate of soda. In cases where soda is needed without any boracic acid it may be bought plentifully and cheaply as soda ash, which is made in enormous quantities from common salt for use in the arts. It can also be obtained as salt cake, which is a sulphate of soda, or as common salt, which is a chloride of soda, or as the nitrate of soda, or as albite, which is a soda-alumina silicate, or soda feldspar. None of these last compounds are very widely used, however.

Lime (CaO) is added as the natural carbonate, obtained in varying purity as limestone, chalk, marble, or oyster shells, either raw or artificially prepared in the form of whiting or paris white. It is also used as quicklime, or as slacked lime, or as plaster of paris, which is a dehydrated sulphate, or as oligoclase feldspar, which is a soda-lime-alumina silicate. Some potters employ pulverized glass as an addition to glazes, but few know why they do so or what elements it is the means of introducing. As a rule, it would bring in soda, lime and silica, as we have seen before.

Lead Oxide (PbO)—This is the first metallic oxide which we have yet considered whose corresponding metal is known to us familiarly. It is used very widely by glazemakers, principally as oxide or carbonate. There are two oxides which are in common use—the yellow oxide, or litharge, and the red oxide, or red lead. It takes 227 pounds of red lead to do the work of 223 pounds of litharge, and 267 pounds of white lead for the same quantity. The latter is generally supposed to be the purest form of lead which can be obtained, and is hence generally used for the highest grades of work. The sulphide of lead, or galena, which is the commonest lead ore, was formerly used as a glazing material. The old English potters sprinkled it on the wet surface of their freshly turned ware, which received only one burning for both glaze and body. This practice is now almost obsolete, as it has been proved to be very dangerous to those using the wares on account of lead poisoning. The lead oxide only got access to free silica from the clay itself, and hence the glaze was variable in character, and often so basic as to readily dissolve in weak acids such as used in cookery. This never takes place when silica in sufficient quantity is used with the lead in the glaze. Tin ash also is sometimes used as a source of lead; it is a mixture of the oxides of tin and lead, produced by melting and roasting portions of the two metals together.

Alumina (Al_2O_3) is a constant and most important ingredient of glazes, though a very unimportant one of glasses, where it is generally accidental. It is added principally in the form of feldspar, Cornish stone or kaolin. These minerals are all cheap, and fairly free from other oxides, except those which are proper to the glaze. Cryolite, a fluoride of soda and alumina, is used for an opacifying agent to some extent. Ammonia alum could be employed, if a need for alumina without any accompanying oxides arose.

This completes the list of the most important of the glaze-making elements. The others are employed for coloring or other special purposes, and will be described only briefly.

Baryta is obtained in the market either as barytes, or heavy spar, which is the sulphate, or as witherite, which is the carbonate. An artificial carbonate is now on the market which would be very satisfactory for glazing purposes.

Magnesia is obtained either from Dolomite limestone, containing 44 per cent. of magnesia, or from magnesite, which is the pure carbonate of magnesia. Zinc is used as the oxide, which is obtained, cheap and pure, in the market.

Cobalt, nickel, copper, uranium, tin and antimony are bought wholly as oxides, pure and ready for use.

Chromium is used in various forms. It is supplied as an oxide or as chromate of either potash, lead or barium.

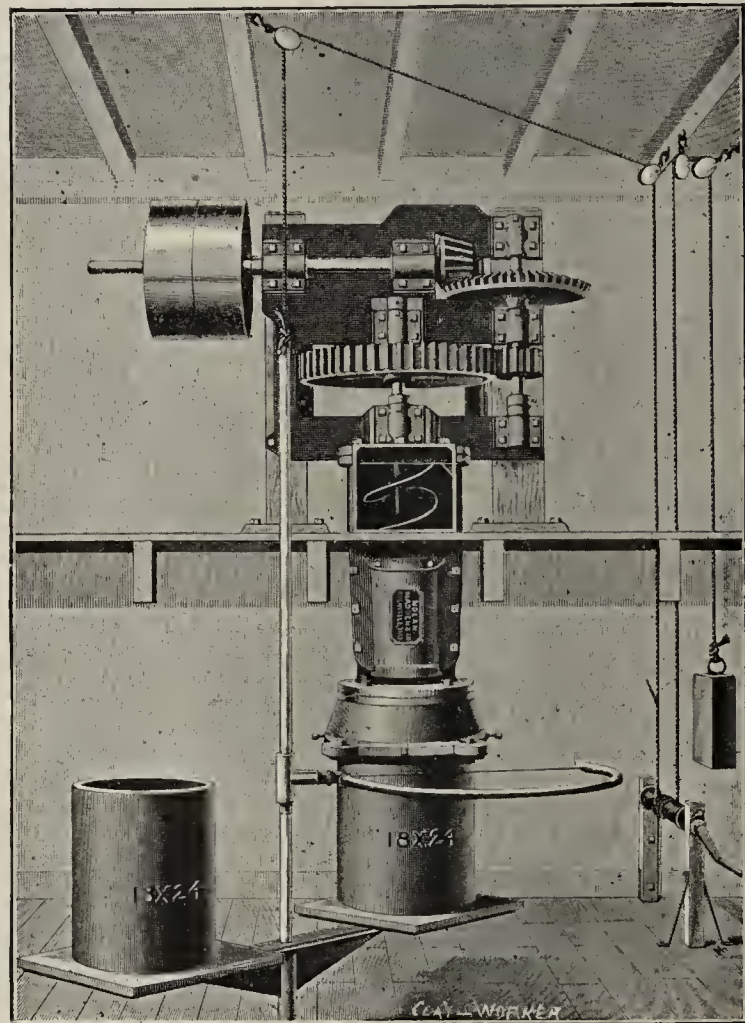
Iron is used in a great number of natural forms, such as

ferruginous clays, ochers and iron ores. It is also prepared by roasting the sulphate till it is free from sulphuric acid, when it is called crocus powder or Venetian red.

Manganese is sold largely as natural oxide, like the German "brown stone" or the black pyrolusite sold in this country. In cases where the pure manganese color is wanted, resort is generally had to an artificial carbonate, for the native compounds all contain enough iron to spoil the deep wine color produced by the oxide of manganese alone.

A GOOD TILE MACHINE.

It is doubtless true that, as the philosopher says, "There is no great evil that does not result in some good." Those who are now waterbound and look from the temporary quarters along the levees of the Mississippi in grim despair upon the waste of water that, for many miles, covers the fertile fields, which, at this season of the year, they are ordinarily planting in corn, cane and cotton, will get but little consolation from the fact that the unusually rainy season that has wrought their trouble will be the making of many a farmer and drain tilemaker further



north. This is cold comfort for the flood sufferers, but it's true. The long looked for wet season will stimulate the tile business throughout the Central Western States. Farmers will again realize the necessity of underdraining their land thoroughly. The wise tilemaker will take notice of this and put his factory in order. The use of large tile will be more common than in former years. Those who want to meet this demand will find it worth their while to investigate the merits of the vertical tile machine here illustrated. It is manufactured by Madden & Co., Rushville, Ind., (see ad. on page 473), who claim that it has many points of advantage, particularly for large tile. It makes tile from eight to twenty-four inches in diameter, and their special cut-off tables can be adjusted to cut tile any length desired. For further particulars address the manufacturers.

It is said that in battle, during heavy cannonading, when a shout cannot be heard, a sharp little whistle will catch quick attention. It is often so with a sharp little ad. pitched in an original key.

A FREE SCHOLARSHIP IN THE OHIO SCHOOL OF CERAMICS.

As announced in the April Clay-Worker, under the patronage of the N. B. M. A. a free scholarship in the Department of Clayworking has been established in the Ohio State University at Columbus. Students desiring to enter the class should address Prof. Edward Orton, Jr., for blank applications for admission to the school, and observe carefully the instructions that will accompany same. The requirements will, in part, be as follows:

—What the Free Scholarship Means, and How to Obtain It.—

1. A paid scholarship, to be known as the "National Brick Manufacturers' Scholarship," will be established in the Ceramic Department of the Ohio State University for one year, beginning Sept. 15, 1897, and ending June 15, 1898.

2. The recipient of this scholarship will receive the sum of two hundred dollars (\$200) per annum, paid in ten monthly installments, as compensation for his services.

In addition to the money actually paid him, all fees, dues, laboratory expenses, chemical supplies and other official expenses will be paid from the funds of the scholarship.

Further, one-half of the time of the student will be at his own disposition, provided only that it shall be used in the prosecution of such studies in the University curriculum as he may elect and be able to maintain.

3. In return for these advantages and emoluments the recipient shall give one-half of his time for each week day of the college year to such work as the Director of the department shall indicate. The duties will consist of experimental investigations into some problem of the clay industries to be designated by the committee and superintended by the Director of the department.

4. The selection of the recipient of this scholarship from the various candidates shall be by competitive examination, in which the following factors and weightings will be taken into consideration:

A—Scholarship (by written examination).....	85 per cent.
B—Practical experience in the clay industries.....	10 per cent.
C—Special adaptation to the position.....	5 per cent.
	100 per cent.

No candidate will be eligible for examination unless he is either personally known to some member of the committee or can bring a certificate of good moral character from some person in authority at his home.

A—The written examination, which is the principal determining factor in the contest, will be conducted upon the following subjects and with the following weightings:

Subject.	Weighting.	Remarks.
English.	5	No formal examination will be held in English, but all the papers presented on other subjects will be criticised in reference to their correct use of the language.
Algebra.	7	Thorough Quadratics. Text book used in examination, Wentworth's.
Geometry.	3	First three books, Plain Geometry. Text book used in examination, Wentworth's.
Physics.	15	Text book used in examination, Carhart & Chute. Gage, Appleton, or Harvey, are fair equivalents.
Elementary Chemistry.	15	Text book used in Examination; Remsen's "Introduction to the Study of Chemistry."
Qualitative Chemical Analysis.	10	Text book used in examination; W. A. Noyes, "Qualitative Analysis." Examination will consist of actual analysis of one unknown body, giving written statement of methods and reactions.
Quantitative Chemical Analysis.	15	Text books used in examination: N. W. Lord's "Notes on Metallurgical Analysis," and "Thorpe's Chemical Problems." Also, Note books showing actual work on quantitative analysis done by student must be submitted.
Geology.	5	Text books used in examination: LeConte's, "Elements of Geology" (smaller edition), "Tarr's Economic Geology," Part two.
German.	7	Examination will consist of one-half hour trial at translation from "Die Thonindustrie Zeitung." Each candidate will be supplied with a lexicon during trial.
Mechanical Drawing	3	Candidates must submit at least 5 plates or drawings made by himself.
Ceramics.	15	Candidates having had course in Ohio State University, will be examined on work as taught there. Candidates not having had this course will be examined on the following, as equivalents: "Langenbecks Chemistry of Pottery" "Zwicks Ziegeithone."
	100	

B—The grading of applicants on their previous experience will be based on the answers given to the following questions:

First—Name the branch or branches of clayworking in which you have had practical experience, giving the names of the companies or firms by whom you have been employed. (Brick-making, sewer-pipe making, pottery making, etc.)

Second—Give the time spent in the active pursuit of each branch.

Third—State in what capacity you were employed or if you were employed in more than one capacity; give the various positions occupied and approximately the period in each, and the responsibility devolving on you. (Whether laborer, foreman, burner, clerk, etc.)

C—The third section of the examination, on which a possible grading of 5 will be allowed, is really only designed to guide the committee in case two young men of approximately equal acquirements as scholars and with approximately equal experience in practical work should contest for the appointment.

In this case, the committee will endeavor to determine by actual contact with the applicants that one who is most favored by nature and experience for the work to be undertaken during his period of incumbency. The committee regards it unlikely that any such contingency will arise, and expects that the written examination and past experience of each applicant will suffice to grade him properly.

5. The examination will begin on Monday, the 14th of June, 1897, at 9 a. m., at Orton Hall, Ohio State University, Columbus, O. Each applicant must be present in person. No other examination will be held, and intending candidates must be there on time.

For any further information apply to Prof. Edward Orton, Jr., Ohio State University, Columbus, O.

Written for the CLAY-WORKER.

THE NEW YORK MARKET.



IF THESE LINES run awry you must not place the blame on me, for, like many thousand other Jerseymen who were foolish enough to tempt Providence on Grant day, I drove over to the banks of the Hudson, with the result that, I must say, it was the most disagreeable day I ever experienced when out for pleasure. The wind must have been holding back to have a good blowout, which it did with a power of about forty miles an hour. Going, the wind was with us; under the hill at Fort Lee the wind was not of much force, but the sun did not shine, and such a shivering lot of humanity is not often seen. On the return trip, as soon as the top of the hill was reached, the dust (I may say pebbles), driven in the face by the force of the wind, was something to be remembered. To have to ride six miles right in the face of a cold northwest wind, with dust thrown in, was far from enjoyment. The next day I was laid up, nearly blind.

War was well represented by the naval vessels; pleasure by the number of steam yachts; commerce by the tugboats and passenger steamers, and the only vessel which passed through the line was a schooner loaded with brick on its way to market. Five years ago, during the Columbus demonstration, the only vessel that passed through was a sloop with a cargo of brick. Verily, brick was in it.

In looking over the Clay-Worker there seems to be reflected through its pages an improvement in the trade in different sections. April has been quite fair, as regards the weather, in this section, if the manufacturer was inclined to begin. There is probably no class of men in business who are so depressed as the manufacturers of common brick. The old stock is working off slow, the price is away down low, and if the demand does not improve, with good weather, by the Fourth of July, they will be forced to throw stock on the market for room or stop. Possibly the month of July will find some yards finishing up. This spring the brickmakers who in other years were getting a kiln ready to burn have not as yet pumped out the clay bank.

It is only because of the "hope that springs eternal in the human breast" that there may be a change for the better before the end of the season which is the prime cause of many of the yards running the coming season. It shows that there is no life in the trade when there has been no movement to do something to help the business by agreeing to a short season or a reduced production; nothing is heard; each is left to do as he thinks best, the first time in many years.

—The First Yard to Open—

The season of 1897 is, at present writing, burning the first kiln of six arches, but none of its product goes to the New York

market; all shipped by rail to Paterson. Others are pumping out the clay pits. On one yard there have been two six-inch and one ten-inch pump going twenty-four hours each day, except Sunday, for the past two weeks, and it will be nearly another week before the water is out. On another yard, for the past ten days, the pump has been run till midnight, making nearly eighteen hours a day, and will require another week's steady running of the pump to allow them to get in the bank with horse and cart. As to any preparation to get the yards in order, there is no movement, and no start will be made till after the water is all out, so that it will be near the 15th of May before the majority of the yards will be going. There will be one yard that will not run. There are three yards which have not made any start to pump the bank, and in former years these were always the first to begin.

One of the Haverstraw papers contained a notice in the early part of April that one of the yards at Hackensack was burning a kiln, and will likely say, next week, they are burning the second, giving the impression to its readers that the yards here started very early, when, in fact, both kilns were made last year, and stood under the shed, ready at any time to set fire. On some yards the risk would not amount to shucks, but on this yard it is not uncommon for the tide to come up under the shed, and, as I mentioned last fall, put out the fires in the arches. It would seem as if it were better to let the money required for wood and labor lay without interest rather than take the risk of the whole kiln being spoiled.

—Along the Hudson—

There are some changes. Some of the yards will stand idle because the parties will not release, not because the rent was too high, but was on a percentage of 10 per cent., which when freight and commission off is low, but those who have been running there have found it a losing game and concluded to stop. As one of our writers says about graveyards, some have found that brickmaking is a graveyard for many a hard day's work and sleepless night, as well as the money. About the second year of the depression a gentleman of my acquaintance who had been around brickyards all his life was taken with the fever, and thought it a good time to lease a yard and start for himself. He was advised to wait till the turn came. "Oh, no," was his reply, "there will be no yards to lease then. I am satisfied if I can make just my living for a year or two." Well, he leased a yard, and, from reports, the yard has been a "graveyard," both to hopes as well as hard-earned money and many a hard day's work, as he is credited as the hardest worker on the yard.

—When Will the Turn Come?—

There is one thing that we cannot discount, and that is the future, and if there is any trade that has the same outlook as the brick trade I am not aware of it. There is one thing the brickmaker need not lose any sleep over, as it will not injure or benefit him, and that is the tariff. He must look for a more extended field of home consumption for his stock for help. I am speaking more particularly of the yards on water that float stock to one market—New York. The manufacture of common brick has increased very largely, not only in this part of the land, but all over the country. Certainly there is no one market that has to handle as many brick as New York. If that cry of low prices which has been heard so often to stimulate building, as many believed would take place, has been well proved, the past three years, to have no effect, as brick has ruled away down, with a falling off in demand, shows that there is no help from that source.

The parable of the man who put up larger barns for his stock would, in the brick trade, be some help—that is, if the shed was made to hold more. Another machine was not put up to fill the added room. The shed capacity of no yard should be less than would hold the total output of a season. The benefit would be in not having to throw stock on the market for room, no matter how low the price. When the price did not suit keep on making, thereby holding them under the shed, instead of shipping and placing their stock where it would not bring a satisfactory return. There are times when stock will work off fast and at good figures. That has been the case. Will it ever return? Even then, during June, July and August, there is a drop in rates that would pay a good percentage on the investment if the brick which have to be shipped for room were held and the market kept in the producers' hands instead of the buyers'. Some will say, Where is the room to put up such sheds? I will admit that in Haverstraw it is not possible without reducing the number of yards. The same might apply to Verplanck's Point, New Windsor and Dutchess Junction, but from that point north to Albany there is lots of room. And, again, where is the money to come from to build these sheds? About four million per yard is the amount placed on leased yards to be made; as the majority of the arches will contain 40,000, it would take 100 arches to hold that number, or twenty-five bents, of 16 feet 6 inches, of arches

of fours, to hold the quantity named. If all the other outfit of a yard could be furnished as cheaply as the shed it would not cost a great deal to build a yard. At the present time \$5 a running foot would cover the cost. How about the extra cost of wheeling the green brick? Say it takes one more man to wheel a pit of green brick of 22,000 or 23,000 at \$1.50 per day, what would it amount to in cost compared to what a steady rate would return to the manufacturer?

—Greater New York.—

Although the city has enlarged its area by taking in Brooklyn, Staten Island and other towns which lay above the Twenty-third and Twenty-fourth wards, across the Harlem river, as well as towns on Long Island, it does not add any territory for the use of brick that does not already exist. The further from the river you go the more the quantity of brick used is reduced. Your readers need only look at the report of the number of permits and the cost of the buildings in Brooklyn to see to what a large extent frame houses are allowed in the suburbs. The brick consumer is Manhattan Island. The process of tearing down small and erecting large buildings, as well as the improvement of vacant lots, takes, in the aggregate, a very large part of what is sent in. It is quite certain that no material benefit can come from annexation to the brick trade. Past experience has proved that if an underground railroad should become a fact it will not be of any great benefit, as the whole is the oyster for all; so New York city would be flooded with brick, not only from tide water, but from Eastern yards as well, as the aqueduct was a lesson. As to combination or syndicates, or, in fact, anything to help by a united action which might aid the manufacturer in making money, it is one of the last things to draw them together. The fable of the Kilkenny cats is a fit simile.

—The Strike—

Which was threatened at last writing was avoided by arbitration through the President of Columbia College, Seth Low; still, there is a discontent among a portion of the same craft, and it is liable to break out at any time.

Friend Crary, it would be a grand thing if all brickmakers would become interested and furnish the Clay-Worker with figures of brick made and stock on hand at the end of the year. Push it.

—Death of Henry Wiles.—

Death has removed one, though not a brickmaker, closely connected with the trade—Mr. Henry Wiles, of Wiles Bros., Grassy Point, N. Y. Mr. Wiles was the outside member of the firm as long as he was able, and, in fact, he should have given up before. He was on the road throughout the Eastern States and Jersey, overseeing new work and making repairs. About a year ago they formed a stock company by taking in some of the sons as a relief to the senior members. The rest for him was short. His has been a life of activity that few men can boast of.

—The Market—

For April has been a fluctuating one. The stock being held back to some extent caused a slight advance. One would think that, with the day of making so late as May, there would be a steady market, like a nicely balanced scale. It took but a slight increase in shipments to drop it.

First week in April, North Rivers, \$4.12½, \$4.25, \$4.37, \$4.50, \$4.62½ and \$4.75; first week in April, Jerseys, \$3.75, \$4, \$4.12½ and \$4.50; second week in April, Jerseys, \$3.50 and \$4; second week, North Rivers, \$4.37½, \$4, \$4.62½, \$4.85, \$4.87 and \$5; third week, North Rivers, \$4.37½, \$4.50, \$4.62½, \$4.75, \$4.87½ and \$5; third week, Jerseys, \$3.50, \$4, \$4.12½ and \$4.25; fourth week, Jerseys, \$3.50, \$4, \$4.12½ and \$4.25; fourth week, North Rivers, \$4.25, \$4.37½, \$4.50, \$4.62½, \$4.75, \$4.87½ and \$5.

There is a variety in prices during one month. Your readers can take the best and compare them with the rates they receive. From this list \$1.25 per thousand must be taken off to make it net. No doubt they will be thankful that they are not in it.

A. N. OLDTIMER.

The Jeffrey Manufacturing Company, of Columbus, O., is out with its 1897 catalogue, descriptive of chains and labor-saving devices. This catalogue is gotten up in handsome style, and is one of the most complete of its kind published. The first part is devoted to illustrations of its labor-saving appliances as applied to the various industries, while the balance of the book is devoted to the illustrating of its various chains, sprocket wheels, cable conveyor fixtures and general mill and factory supplies. It is a valuable reference book, and its price lists are such as will be of interest to all using labor-saving appliances. Copies can be had by addressing above company at Columbus, New York, Philadelphia, Buffalo, Chicago, St. Louis and Denver.

AN INTERESTING EXPERIMENT IN SETTING AND BURNING BRICK.

AT THE RECENT CONVENTION of the German clay-workers Mr. Bock spoke of an interesting instance where the burning of a continuous kiln was regulated and improved by a simple modification in setting. The owner of a brick plant, during the winter months, was compelled to lengthen the time of burning in order to give the green brick in the drying room above the continuous kiln more time to dry. Owing to a lack of dry brick he could not burn at the normal speed. The continuous kiln in consideration was of the ordinary type, with an uninterrupted tunnel, the gases escaping through flues in the arch. Now, in order to accomplish the desired result, he intended to stop the fire by a wall across one of the kiln sections. Behind this wall, which had only four holes at the bottom, the green brick were set as usual. Thus the fire reached the obstruction, and its only opportunity to advance was through the openings at the bottom. But, to the surprise of the gentleman, when he opened the first fire holes on top of the kiln, behind the wall, he found there a beautiful, uniform heat, such as he had never observed at this stage before. The explanation of this phenomenon is a very simple one. The unconsumed carbon of the fuel in the ordinary run of burning passed through the kiln side by side with the oxygen of the air, without getting a chance to thoroughly intermingle. But when the direction of the draft was suddenly changed and the gases struck the obstruction, a more intimate mingling took place and the unconsumed carbon was burned up, thus generating more heat, so that there was actually a hotter fire behind the wall than on the other side of it, where the gases had full sway. The same principle is employed on every lamp where the combustible gases are made to pass through a narrow slit.

This experience has been applied by arranging such obstruction walls, built up with green brick, at intervals of twenty-eight feet. The results achieved by this system of setting are remarkable; the burning proceeds at a more rapid rate and more uniformly than before, with a noticeable saving of fuel. At first it was expected that the cooling of the kiln would take place much slower with this plan, but this is not the case, and the owner even claims that the temperature in the sections which are being drawn is more comfortable for the men than it was previous to the change. The main result of the uniform burning now made possible is the remarkably even color of the ware, which alone more than pays for the little extra trouble in setting the walls.

AN OLD ESTABLISHMENT.

A few days ago your correspondent had the pleasure of a visit to the plant of the Turner, Vaughn & Taylor Company, at Cuyahoga Falls, just four miles north of Akron. A few moments' ride on the electric line and you are landed at the office door of one of the oldest and most reliable firms in the manufacture of clayworking machinery. For over thirty years the efforts of this firm have been toward the improvement of and care in the producing of only first-class, high-grade goods, and well may it be said their efforts have not been in vain, a fact attested by a good and steadily increasing business. This firm manufactures all machinery and fixtures found in a well-regulated and well-equipped sewer pipe, brick or tile plant.

The accompanying cut represents the patent Vaughn sewer pipe press, made in six different sizes, of which this is the largest, having a 60-inch steam cylinder and a 36-inch clay cylinder. They have built this press since 1872, and it is acknowledged one of the best presses on the market for strength, durability and being easily handled. The presses are built in two ways:

First—With steel spider at the bottom end of clay cylinder, in which is located the center cut-off sprocket and stem. In this arrangement, the spider being down tight, the dies can be held rigid and firm, and clay must issue even around the die because of its being central.

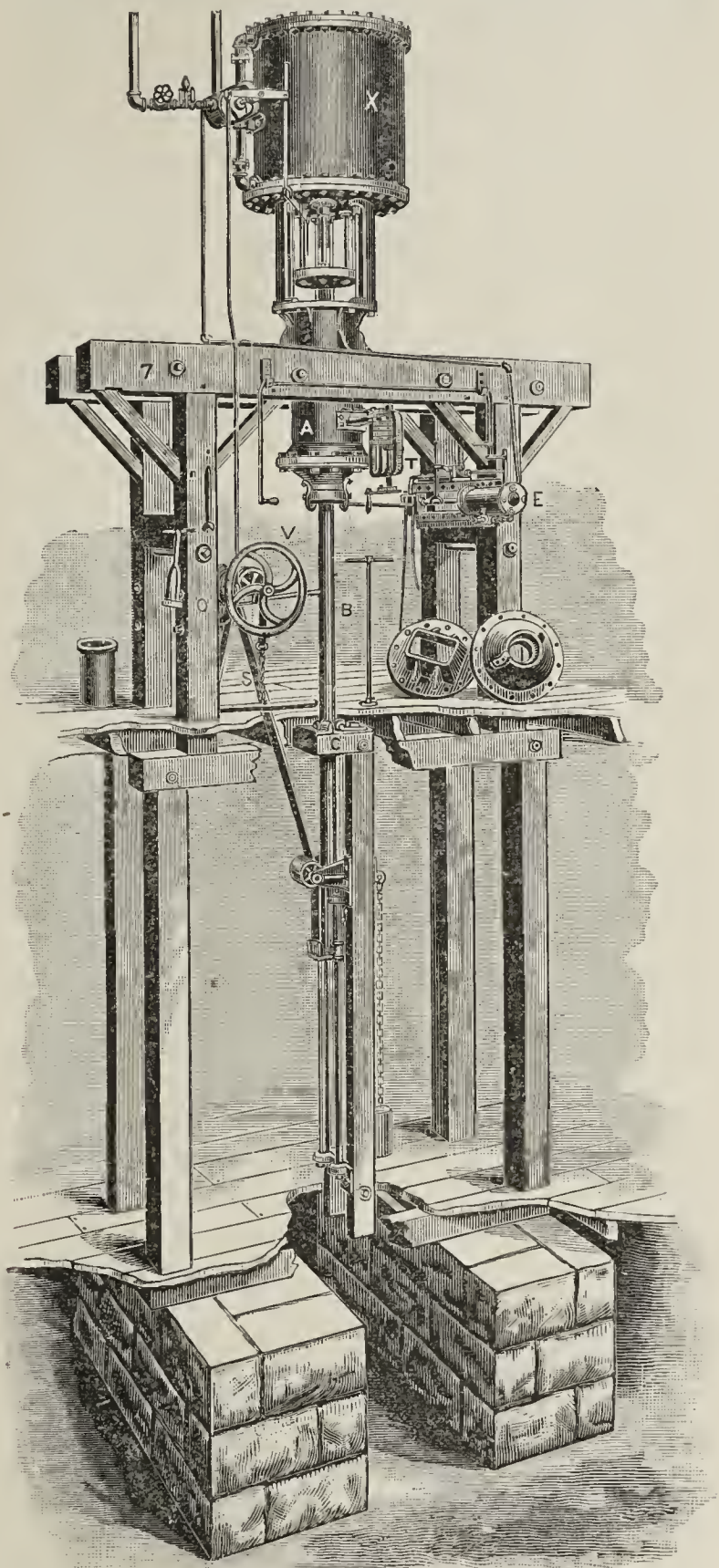
Second—A steel spider is placed between the columns on a press where the clay will not unite over the spider, as in the first arrangement, and from this spider a long stem is dropped, which passes through the clay follower and the entire clay cylinder. This is somewhat in the way in filling, but there is no other means for suspending the dies when clay is "short." The clay cylinders are not built up of extension rings, making a bother in changing the dies, but make the clay cylinder solid and the end of the dies standard and all dies will be same size and fit the same standard.

All standard machines are built with a power cut-off, and this is arranged convenient for pressman to handle. It can also be arranged in any other position required.

There is arranged on the clay follower an automatic trip, so that when the pressman reverses his lever the piston will run up quick, and by this arrangement will not bump the top-head, thereby breaking either piston or head.

The machine is built so that the pressman is always on his feet and ready to handle any and all levers, which are so arranged that he can reach them all without moving from his position.

In the forty-four shops included in the sewer pipe combina-



tion now in course of organization eighty-six sewer pipe presses are in use. Of this number, thirty-nine are of the Turner, Vaughn & Taylor Company's make, nearly half theirs against the entire field.

This company is now making an outfit of sewer pipe machinery for the Los Angeles Stoneware Company, of Los Angeles, Cal. The officers of the company are: C. W. Vaughn, President and Treasurer; Chas. F. Plum, Secretary, and J. W. Hawkins, Superintendent.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Setting Brick in Kiln.

Editor Clay-Worker:

From the youthful Association of Nebraska we have a most excellent paper on "Setting and Burning Brick" in the open-top, up-draft kiln, by Mr. C. F. Kaul. The portion of Mr. Kaul's paper to which I wish to refer is where he describes his method of platting. He builds flues from center to heads of kiln under the platting, which, as soon as the watersmoke is off, he covers with earth. I have practiced this method (except that I do not cover with clay until the finishing heat begins to show through the platting) with unvarying success for years, and would most strongly advise every burner of an up-draft kiln to give it a trial. It is obvious that in this way the heat must be driven to the heads, where it is most needed.

R. M. GREER.

A Brickmaker's Vacation.

Editor Clay-Worker:

In the April number of your journal its readers were informed that my wife and myself were recreating in North Carolina. They were also informed that in addition to an expensive trip, I was contemplating putting a lot of money into the best hotel in the world. Ordinarily, I do not object to being advertised as a capitalist, but inadvertently you have caused me much embarrassment. If you had known the excuses I have been compelled to make during the past two years to Chambers Bros. Co., the American Clayworking Machinery Co., sundry coal, oil and other dealers, to say nothing of the banks, you could never have given me away. Will you please square yourself by telling all the victims of my impecunious creditors that the money for this trip came from the government of the United States. That after waiting thirty-two years the Treasury Department discovered that it owed me quite a sum of money, and paid it, and that I have not used money that should have gone to pay my just debts. There may be some old-fashioned brick-makers who will feel like criticising this distribution of money, no matter from what source derived. To them let me say that I have done very little traveling, and that North Carolina was a State I had never been in. That I had little to do here, and, well, the temptation came and I yielded. Let me say, too, that I am not sorry for it. The ride by daylight from Knoxville, Tenn., to Asheville, N. C., on a beautiful April morning, would do much to allay a few twinges of conscience, and a week of the drives, rides and walks in and around Biltmore and Asheville would almost convince a Chicago brickmaker that he had been transported to that haven of rest he had so long desired. We did eat and sleep at Kenilworth Inn, but the balance of the time was put in prospecting for the best point of observation. We were fortunate in being able to drive through the Vanderbilt estate whenever we desired, and had unusual opportunities to see the transformation of eight thousand acres of worn-out tobacco farms to a beautiful park, with some fifty miles of excellent driveways. I am not going to endeavor to be exact in my statements, and desire to have it understood that the letters E. & E. O. are characteristic of this letter. Suffice it that Biltmore is a wonderful illustration of what can be done with good intentions and plenty of money. Future generations will call blessed the memory of the man who is now doing so much to beautify the landscape around Asheville, and to add by artificial means to the wonderful gifts of nature. The good work is still going on, and the plan of the elder Ohmstead is far from completion, but under the direction of his son and successor the work is still progressing. The March pay-roll for the Biltmore estate was in excess of \$18,000. Grading, draining, transplanting trees is all the time being done on a most magnificent scale.

On Easter Sunday we attended the Biltmore Episcopal

Church. The floral decorations from the greenhouses of the estate were worthy of the day; the service most impressive and appropriate. The church is built of an end-cut common red brick, made within a stone's throw of the church, although the yard has now been put to other uses. The brick walls above the wainscoting are bare, and are a fine sample of plain masonry as an interior finish. Asheville is a city of twelve thousand inhabitants, with three miles of fine brick paved streets. Need I say more for its inhabitants or its city government? But I only intended to express my opinion of you, and must draw to a close without finding words to accomplish my purpose. Perhaps Brother Batley will take the matter up where I leave off, as I understood he has gone back to Bucyrus again and will doubtless feel interested in my explanations. Suffice it that I can recommend Asheville as a most desirable spot to rest in. Good air, good water, good roads and hotels that cannot be excelled, although Brother Batley would write columns on prices where lines sufficed at Buffalo. Mrs. P. and I are both well, both enjoyed the trip and do not hesitate to recommend it to our friends.

D. V. PURINGTON.

Chicago, May 13.

A Good Man a Victim—An Open Letter to A. R. Batley.

Editor Clay-Worker:

It has been a matter of deep regret to many of the readers of our trade journals that my friend, Alex. R. Batley, has been the victim of a delusion. He has, under the sinister influence of some malign spirit, been led to think that there was a necessity for some shading to the bright picture which presents itself to the memory of every brickmaker when he recalls the incidents and pleasures of the late Convention at Buffalo. This gloomy delusion has so imbued the mind of Mr. Batley that he has apparently been compelled to use green goggles when he looks toward Buffalo, in order to screen his eyes from the radiance of that glorious season.

Brother Purington set a true ideal before us when he referred to his having had to sleep in an attic and under a canvas tent in his early years. One's surroundings are of little moment compared to the achievement of a good purpose.

We went to Buffalo to meet friends and to work for the N. B. M. A. We did meet friends, and we did some of the best work ever done by the N. B. M. A., impelled thereto by the energetic welcome and hospitality of the friends in Buffalo.

Ah, Batley! How could you "fret and groan" about your room in the hotel and the bill? The one so small, the other one so great! Did you not get your money's worth at Buffalo? Who was your debtor in all that gathering?

I think you were imposed upon (for I saw some kicking by evil disposed persons), and, yielding to your boasted Anglo-Saxon privilege of grumbling, you undertook to rake some one else's chestnuts out of the fire, and, my dear boy, you got scorched.

I have often sojourned in Buffalo, but never before at the Tift House; yet I must say that I was well content with my treatment in every particular. I only paid \$2.50 per day, yet I had a large room, well lighted and comfortable. I arrived very late at night, and the clerk told me that he would have to crowd me somewhat, but that if I would submit until next morning he would fix me all right, and he kept his word without any reminder from me. I did not try to scare him with the T. P. A., either.

Now, Friend Batley, do not let any one fool you. You have been hasty; now, just admit that you were somewhat rattled and wrote without due consideration of the consequences to others because you felt that you were a victim. You were most surely a victim, but not the victim of any conspiracy on the part of any of the officers of the N. B. M. A. nor of the hotel folks in Buffalo. You were the victim of gross misrepresentation made by those who had an ax to grind, or some personal motives, and who, knowing your "Johnny Bull" readiness to kick upon occasion, used you to do what they lacked the pluck to do.

I am glad that you so freely acknowledged that you were wrong in using the names of other persons without their consent, but you ought not to qualify your acknowledgment by charging them with moral cowardice.

Just think a moment of what unpleasant thoughts and unkind words your hasty note has been the cause, and consider that you have (as I believe) unwittingly made them a portion of the history of the Buffalo Convention of the N. B. M. A. Will you not revoke this mistake? I think you will.

You know, Friend Batley, that I am your fellow-countryman, your friend and co-worker; that I have no wish in this matter but to see you put yourself right and to stand square among your comrades of the N. B. M. A. On this account I

entreat you not to go on record as the one man that cast any shadow or threw any apple of discord upon our late meeting at Buffalo. Yours sincerely, JAMES TAYLOR.

Roof Tile—How to Make Them.

Editor Clay-Worker:

I am reminded by the receipt of several letters on the subject, including yours of the 26th ult., that I have not yet fulfilled my promise in November Clay-Worker to "endeavor to describe from experience how, with comparatively little machinery, a first-class roofing tile can be made with less than 5 per cent. waste from pug mill to storage shed, and 100 per cent. burned hard in an up-draft kiln, with a loss of less than 1 per cent." Those interested will please excuse the delay. One correspondent thinks I have undertaken a pretty large contract in proposing to describe how to burn 100 per cent. hard in an up-draft kiln, and hints that perhaps my inability to do so may account for my delay in writing. I hope, however, before I "get through," to be able to convince my incredulous brother that not only I, but he, or any one else who has the necessary ability and patience, can do so.

In discussing this question we will confine ourselves entirely to the large interlocking tile, which is so superior to all other types for all ordinary purposes that it would seem like waste of time to talk about any other.

The first thing to be considered in the manufacture of roofing tile is the selection of the clay. Do not, however, too quickly conclude that your particular clay is unfit for the purpose. I have made excellent roofing tile out of clay which, from lack of knowledge as to how to work it, I had previously condemned as unfit even for common brick. There are very few clays suitable for drain tile which cannot be made into roofing tile that will at least control a local market in competition with iron, tin, wooden shingles or even slate, which probably will have to be brought from a distance at considerable expense. Do not let "unsuitable clay" be "a lion in the path."

Preparation of the clay is the next step, and a most important one. The writer's method is somewhat as follows: The clay is turned over in the bank and thrown into long piles some months (the longer the better) ahead of the haulers, any inferior strata or pockets being thrown out or removed for the manufacture of brick. It is then soaked over night and passed through smooth rolls, set as close as practicable, into a soft mud machine and made into brick. These are placed on pallets in close racks, and allowed to toughen for a few days, carefully protected from atmospheric influences. They are then very thoroughly pugged and the mud placed in convenient piles in the drying sheds, where it is covered and allowed to toughen for at least thirty-six hours before it is molded. That is, if the slabs are to be made by hand or in a pipe and tile machine. Those who prefer it can pass the mud (in the form of bricks) through a stiff mud machine, instead of, or in addition to, the pug mill.

For the information of those not familiar with the making of the slab I will briefly describe how the operation is performed by the Mexican hand molder. He takes the mold, which is a rectangular one, preferably of copper or brass, about half an inch deep and somewhat larger than the tile to be made, and places it upon the table, which consists of a 12x2-inch plank, about three feet long, planed true and mounted on stout legs, well braced. A handful of sand, adroitly scattered, sands, at the same time, the table and sides of the mold. He then cuts sufficient mud to make a tile off the pile and throws it into the near end of the mold, and with two or three quick pushing movements of the open, joined hands the mold is filled. The surplus mud is then cut off with a thin, narrow piece of board, and the face of the tile smoothed off with the open hand, dipped in water. Some good authorities condemn the use of the hand and recommend a sponge instead. I have tried both, and am distinctly in favor of the open hand. The tile is then slid off, in the mold, on to the pallet, which is placed on a shelf so arranged on the side of the table that the pallet will be a quarter to half an inch below the top of the table. The oft-rearer then takes charge of the slab, which he places in the rack, returning with an empty pallet in time for the next tile. The empty pallets are left in the racks until required, to save room, trouble and breakage.

As soon as the slabs have reached the proper stiffness for pressing, which here we consider is when they can be held upright in the hand without the danger of doubling over, they should be piled about ten deep on a board the exact width of the slab, and said boards stacked three deep in the alleys of the drying shed, which should be made wide enough to admit of this, and covered. It is very important that the slabs dry uniformly, and in addition to boards which can be opened and shut to suit the weather, the shed should be provided with curtains of canvas, sacking, etc., which could be let down in ease

of wind, etc. The piling of the slabs is quite an important part of the process, and should be in charge of an intelligent man or boy. If one end of the slab is harder than the other, which often happens, it should be moistened with water to bring it to the same consistency; otherwise the pressed tile will shrink unevenly and be wider at one end than the other. It is very necessary, also, that all the slabs be piled at the same degree of stiffness. As this, however, is almost impossible, the pressers should carefully keep apart the stiffest pressed tiles, to be set in the hottest parts of the kilns, where the greater shrinkage in burning will offset the lesser shrinkage in drying, and so turn to account what would otherwise be a great disadvantage. This calls for a good deal of method and attention, but will amply repay all the trouble it costs.

In my next I will discuss the pressing, drying, setting and burning. I will also try to answer some questions with regard to cost of manufacture, etc., which time and space prevent my replying to now. I am much pleased to see the subject of roofing tile as a side issue at last receiving some attention. This is a point on which I have been harping for years, and have often felt ashamed of taking up so much of your valuable space with a subject seemingly of so little interest to the general clayworker. I venture to predict that many of those who are now timidly considering the manufacture of roofing tile as a side issue will, ere long, find it the most profitable part of their business. Professor Orton deserves the best thanks of the craft for having brought this matter so prominently before the drain-tile makers of Ohio. It adds another to the many good things he has done for the industry. We want him, however, to be more interested in the subject, and, when he "gets through" with paving brick, to take up roofing tile and apply to it the same thoroughness which seems to characterize everything he does. I agree with Mr. Bleininger that roofing tile, excellent though they are, have not yet reached anything like perfection. Under the master hands of such men as Brother Orton they may confidently be relied upon to attain a superiority which will ultimately drive those inferior roofing materials with which the larger portion of all the houses in the United States is covered entirely from the market. The time will shortly come when not only nearly all new buildings in the States will be roofed with tile, but old buildings, too, will fall in line as their temporary coverings of iron, tin, wooden shingles, etc., wear out.

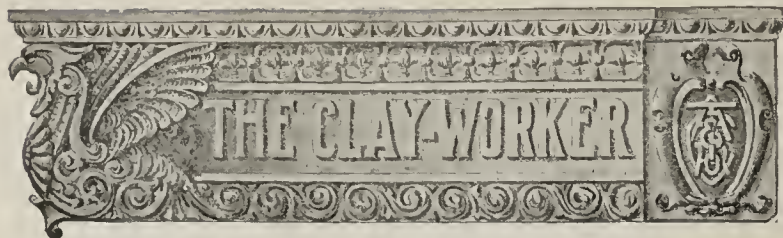
Like Mr. Tiffany, I was somewhat disappointed at the way in which the most important question in the question box was treated at the Buffalo Convention. Those who have had no practical experience in the business or have not given the subject the closest investigation have no right to discourage those who, like the Ohio drain-tile makers, may be threatened with a serious falling off in their business, and are anxiously looking about for something to which they can profitably turn their plant and energy. I do not wish to say anything which might hurt the feelings of any of the brethren, but I feel very strongly on this point, as I am quite convinced that the roofing tile business will prove to many an anxious brother the difference between struggling on and independence and happiness. "Go slow" is, of course, good, sound advice in any new business, and always safe. I give it myself with regard to roofing tile. Go slow, as slow as you please—but go. "Stand not upon the order of your going, but go at once."

R. M. GREER.

Tuxpam, Mexico, March 31, 1897.

MEASURE OF DAMAGES FOR BREACH OF CONTRACT TO FURNISH BRICK.

IT WAS AVERRED in the recent case of LaPorte Improvement Company vs. Brock, 68 N. W., Rep. 810, that the buildings for which certain brick were to be furnished were to be erected to rent as store rooms, and that the contractor for the brick had full knowledge of that fact when he entered into his agreement, and, as a delay on his part caused a loss of rents for some time, it was asked that judgment for the amount of the rents lost be awarded as damages for the breach of contract in not furnishing the brick at the specified time. But it was not shown that the plaintiff could not readily purchase in the market the bricks it needed at the time the defendant failed to deliver them. That being the case, the Supreme Court of Iowa holds that it must be presumed that they could have been so purchased, and that the damages which would result from a breach of the contract contemplated by the parties when they entered into it were the difference between the contract price and the market price at the time the breach of contract should occur, which it therefore holds constituted the proper measure of damages to be allowed for breach of the contract. When brick are delivered that are not of the quality guaranteed, the court further holds it is the right of the purchaser to reject them or to accept them and recover damages sustained by the breach of contract. J. L. R.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " " " " " "	10.00
Ten copies, " " " " " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVII. MAY 1897. No 5.

CURRENT COMMENT.

Students in clay work should give serious thought to the opportunity for higher education offered by the free scholarship in the ceramic department of the Ohio State University. Those desiring more information as to the requirements of the scholarship than is given in the announcement on a preceding page, are requested to correspond with Prof. Edward Orton, Jr.

* * *

In another column our good friend Purington confesses to having received a large, long-delayed and over-due stipend from Uncle Sam. He doesn't say so, but the natural supposition is that it is a pension, and now we are wondering how and where he was wounded. We never before suspected that there was anything artificial about D. V., though, now that we think of it, his chirography does have a wooden-arm look.

* * *

At the close of his interesting letter friend Purington commends us to the tender mercy of Mr. Batley. Another good friend, James Taylor, addresses himself to the same gentleman. In this connection we will say that Mr. Batley called at our sanctum a few days ago and did just what Mr. Taylor urges him to do—made the amende honorable by frankly admitting that he had been misled, expressed keen regret for the injustice done Mr. Randall and promised never to be a party to anything of the sort again. So the affair ends amicably and peace reigns once more.

* * *

The event of the month is the opening of the great Tennessee Centennial Exposition. President McKinley started the wheels in the industrial departments by pressing a button at the White House. The great show, which will continue till November, opened auspiciously. The site is said to be one of great natural beauty and the buildings and displays compare favorably with those of the Columbian Exposition.

The feature of most interest to the readers of the Clay-

Worker is the building erected by Chambers Bros. Co., of Philadelphia, for their sole use. In it will be installed a complete line of their brickmaking machinery, which will be exhibited in operation. Cyrus Chambers, Jr., the senior member of the firm, will give personal attention to the exhibit and extend a cordial welcome to every clayworker who will call and make himself known as such. We will have more to say of this display and the exposition in subsequent issues.

* * *

On a preceding page will be found the first of a series of articles on hollow block construction. The author, Mr. E. B. Durrant, has given years of study to this subject and we feel sure that our readers will find his articles both interesting and instructive. Hollow block construction will play an important part in the building operations of this country at no very distant day.

* * *

The German Clay Stoves, illustrated and described by our German contributor in this month's "In Deutschland," will be considered a great novelty by many of our readers, who, perhaps, have never heard of a clay stove before, though they are very common in the Fatherland. Those who have never sat by a clay stove are unable to appreciate the soft, delightful heat that comes from it. They are very economical in the consumption of fuel and may be made very ornamental. It is strange that they have never been introduced in this country.

THE COST OF FLIMSY BUILDING.

As the science of underwriting comes to be more thoroughly considered, the physical characteristics of buildings are taken into more thorough consideration. The question of the thickness of brick walls, the carrying capacity of piers and floors, is now estimated in determining the rate of insurance in the most advanced insurance circles. In a building in this city which has been carried under the rate of 1.75 per cent., an advance of rate was recently made to 4 per cent. on account of structural deficiencies. This building was of brick, pretentious, gaudy, but inherently deficient as a fire risk. In the long run the owners will pay dearly for the false economy which led them to put up light walls where heavy ones should have been built.

THE BUSINESS OUTLOOK.

It is gratifying to the Clay-Worker, as it must be to its many readers, to report a continual improvement in the business conditions of the country. Of course, we have not yet reached that degree of improvement which is to stop the cry of hard times. The oldest inhabitant does not remember such a time in the past, and the youngest will never live to see it, though he lived a thousand years; but the recuperative forces which inhere in society have largely overcome the set-backs which overproduction and overliving had brought upon us. Old accounts have been squared largely, and by common consent, or more properly by common necessity, we are adjusting ourselves to our environments, and the world is wagging along quite satisfactory to all who accept the Bible doctrine that work is the chief duty of life. It may be that, not looking beyond our own horizon, we see but little improvement, but a broader view must satisfy any one that the worst is past. In our own special industry this is eminently the case. All reports from the field indicate a much greater demand for the output of our yards than was visible this time last year. The price is not up to boom times, and may never be again, but the purchasing value of a thousand brick is not far from that of the highest price of late years, so that, except for those who are in debt, times are as good as ever. One element of prosperity not often taken account of is telling favorably in individuals, as well as in the whole community: we have learned to curtail our wants. With very few has it become necessary to do without real comforts—not a larger proportion than common at all times—but

our wants are always ahead of our means, no matter what our income may be, leading us to extravagance and into debt, and then comes hard times. It is very significant as indicating the improved condition of business that the actual sales of April were only 10 per cent. less than corresponding sales in 1892, the flush year, and they were 6 per cent. better than last year. When we take into account that in 1892 we were living fast and in 1897 we are on the economical pace, this shows that we are quite as well off and business quite as good as it was then. The Clay-Worker attaches but little importance one way or the other to the greatly increased importations of the last few months in anticipation of a higher tariff on some goods and the subsequent large exportation of gold. All that is superficial and harmless. Times are better because the people are adjusting themselves to conditions, and they will grow better and continue better until the next pay day comes, after the next era of extravagance and debt-making shall have run its course.

THE FLOODED REGION.

We have still to read of the great devastation of the Mississippi flood. It is estimated that more territory has been damaged than the whole States of Ohio and Indiana put together, and the worst has probably not yet been reached. Only one late flood, that of twenty-six years ago, has been equally destructive, though it is probable that in prehistoric times even greater floods have been experienced, and, though it is not particularly encouraging, we conclude that even greater may be expected in coming years. We are prone to consider the world finished and to take it for granted that there will never again be floods and earthquakes such as we read of in geological formations, but there is no authority for such views. Let us accept them as a part of the experiences of life. Of course, by expensive dykes, some local protection can be afforded here and there, but floods in the future may be expected as in the past. Meanwhile those of us who do not live in the flooded districts, while not the first or the greatest sufferers, must inevitably be partakers in the loss. Such floods and great fires have much to do with disturbing values in every department of business.

OTHER PEOPLES' AFFAIRS.

Affairs in Europe are not greatly different from that foreshadowed in our April outlook. Events have moved forward, but nothing has been settled. True, it has been made apparent that the small, undisciplined and poorly equipped army of Greece is no match for the immense army of Turkey, with all the modern war appliances, but everybody knew that before the test was made. However, that settles nothing. The question at issue was not whether Greece might annex Crete and drive the Turks out, but whether the bloody Turks should dominate over the fairest portions of Europe and fill the land with blood. That is yet the open question. It has demonstrated another thing of no little importance: it has shown that that alliance of the seven great nations of Europe is, after all, only a make-believe. The part these nations have taken so far is only the part a lot of bullies take when they join hands and form a ring around a big boy and a little boy, to see the big boy provoke the little one beyond endurance and then see that no one interferes with them while the big boy pounds the little one until he cries enough. But now comes the settlement. It is one of the hardships of going to law that the losing party has to pay the costs, however just he might think the contention was. Turkey has charged up to Greece heavy bills of costs, and expects to take a mortgage on the effects of the little state until they are paid, and Greece has nothing to mortgage but her navy. But the end is not yet. The powers may not interfere in the settlement and the mortgage may be taken and may be foreclosed, but they cannot prevent the growth of republicanism in Europe. Already France and Switzerland are republics and have passed the formative period; they are republics to stay, and England is almost, if not quite, as republican as the United

States, barring only the hereditary monarchy, which is practically nothing but a figurehead, the reigning monarch having less power than our President, and already there are strong republican parties in both Spain and Italy. The events of the last six months have greatly increased republicanism in all Europe, and Greece may be a republic in the near future. But there are other and still more complicated questions involved in this European muddle, and we shall not be surprised if, before peace is restored, more and fiercer dogs of war are let loose; we shall be disappointed if they are not. It is hardly possible to settle the main question without war, and this inglorious conquest of Greece by inhuman Turkey may precipitate it.

USELESS EXAGGERATION.

Commenting on the tendency of the press to exaggerate as to circulation, etc., Printer's Ink remarks:

"Even the monthly magazines are catching on to and adopting the evil practices of the daily papers. The Brooklyn Eagle long printed at the head of its columns: 'This paper has a larger circulation than any other evening paper in the United States,' although the Evening World, with several times as large a daily output, is published only a mile away. And now comes the Cosmopolitan Magazine, with a circulation large enough, heaven knows, but claiming 'the largest clientele of intelligent, thoughtful readers reached by any periodical, daily, weekly or monthly, in the world.'"

This spirit of self-laudation, which in other matters would be condemned as intolerable braggadocio, finds ready expression in the industrial as well as the literary magazines; in truth, it assumes the most aggravated form with the trade press. Industrial papers spring up in a night, as it were, and immediately herald to the world their mighty importance, marshaling an array of figures that are overwhelming—in their own estimation. Compared with these wonderful—shall we say magic?—productions, the old established journals are as mere flies on the balance wheels of industry. Luckily for those interested or for whom the bait is intended, such statements are always fully discounted, so that no harm is done except it be the moral stultification of those who indulge in these mathematical gyrations, and that's not much, for morally they have little to lose. The singular feature of this business is the child-like and bland manner in which these exaggerated claims are made. Evidently it is the publisher's idea that advertisers are chumps, ready to swallow any statement, no matter how preposterous. Here is where they err, for advertisers are intelligent and thoughtful as a rule, and, while they may not say much about it, they generally discount these claims fully, so, as we have already stated, no harm is done.

BRICK VS. STEEL CONSTRUCTION.

In the last number of the Clay-Worker was an article on "Brick vs. Steel Construction." We would beg to disagree with the point of view taken by the writer, that steel-framed structures are against the interests of brickmakers and the public. While we can agree with Mr. Morrison on most that he has to say from time to time, we can see what appears to be sufficient reason for disagreement with him in this particular matter. While it is true that steel structures have been put up where the material is not properly protected, it is also true that many steel structures are properly built and the structural materials amply protected. One of our friends said to us that buildings which are now being put up with a steel frame would require four times as many brick if steel were not used. While that might be true in one sense, it is also true that but for steel construction many large buildings and tall buildings would not be erected, and there would not be the demand for brick and other clay products which we now find. Again, what if the use of steel did reduce the number of brick used, which it does not, what is the use to object to it? The idea of steel construction has come to stay. The principle is

correct, and anything which any of us may say against it will be futile. It is well to bear in mind, however, that steel frames lightly protected are not fire-proof buildings, and that where brick are improperly used, or where other clay products are improperly used, there is no reason why disaster resulting therefrom should be credited to the only absolutely fire-proof material known, namely, burnt clay. In this city, as elsewhere, we are able to see that steel frame buildings are erected and that structural material is not properly protected. We have mentioned this matter many times before, and in event of a disaster which will come we will be able to refer to our records and say, "We told you so."

"PAPA" MELCHER NOW.

One of the most popular men about the Indianapolis Builders' Exchange is Frank T. Melcher, general manager of the Marion (Ind.) Brick Works. A large portion of the output of these extensive works finds its way to the Hoosier capital, Frank, by his cordial, genial manners and the excellent quality of his brick having captured the big end of our market. For several years he has spent three or four days of each week with us and has come to be regarded as one of the most regular attendants about the Exchange. Of late his visits have been less frequent. His associates notice that he now comes to town about once a week and always seems bent on taking the next train back to Marion. This is in such marked contrast to his former neighborly and leisurely habits that it caused no little comment. Various guesses were made as to the cause, but it remained a mystery till a few days since, when cards were received announcing that, after fourteen years of wedded bliss, "Frank" was a papa. The little one has been christened Mary Frances Melcher. His friends are now hoping that when the novelty wears off a little "Papa" Melcher will again be a frequenter at the Exchange.

MOVING OF TALL BUILDINGS.

In another column we present a picture and description of the moving of a tall chimney. This calls to mind that recent years have witnessed the full development of the science of moving and shoring splendid structures. An authority on this subject says: "House moving is to-day a science, and so much a science that there is not a structure standing to-day but what an estimate could be gotten in Chicago to handle it, and in most any way the designer's mind might run. If he wanted it moved, it is safe to say an estimate could be made on short notice, and as to shoring up for alterations there is nothing impossible." The same authority says: "No line of work in all the trades or departments of the whole building business can be classed with shoring or moving, as no business encompasses so much risk and ingenuity." Mr. H. Sheeler cites the Emanuel Baptist Church of Chicago as being one of the most difficult pieces of moving. It is a building with a very tall spire, the weights are unevenly divided; also, the walls are widely separated and spanned by great trusses. This building was moved fifty-one feet, raised five feet and six inches. It is of stone, 93 by 161 feet on the ground, with two gables a hundred feet high each, and the tower was 225 feet high. The building itself weighed 6,263 tons and the tower 1,400 tons.

An article in the Engineering News gives a short sketch of the method of doing this work. Tests were first made to determine the loads the earth would bear without settling. Over the space to be traversed a floor of 12 by 12 timbers was laid. On this floor a superstructure of jack screws, timbers and I-beams was constructed. Altogether sixteen hundred rollers and 135 tons of rails were used. It was calculated that the ground and timber supports would settle as the load came on to them and an up-grade of two inches in thirty feet was given the track. Care was taken to have the rollers and steel of the same hardness as the track rails, so they would not flatten and wedge. To prevent the rollers from twisting out of line, the lining was so constructed in plates that after a foot or so of travel each roller was released, and could be put in again in exact line. To

apply the power for moving the building a strong timber was fastened as an anchorage. From this anchorage chains extended back to hold the timbers which acted as a footing against which the jack screws pushed. Altogether sixty jacks were used. They were so arranged as to distribute evenly the pressure along the side of the building. The average progress was nine feet per day. No damage was done either to the interior walls of the building or any other part, not even a crack being discovered from top to bottom.

The Chicago Opera House, a ten-story building, was supported while four stone foundations were taken out and steel foundations put in their place. The courthouse at South Bend, Ind., was moved fifteen feet to one side and 225 feet to the rear. The Equitable Building, in Chicago, an eight-story structure, was supported while nearly all of the interior walls were taken out and replaced. The Baltimore & Ohio freight house, in Chicago, a structure forty feet wide and four hundred feet long, with trussed roofs, was moved 226 feet south, eighty-three feet east and raised three feet and six inches. All of the buildings named were of brick or stone, and we mention this number as indicating the possibilities in modern house-moving. One Chicago contractor has said that he would undertake the moving of the Masonic Temple or the Auditorium, thus indicating that it is possible to move any great structure.

A TOWN TURNED INTO A BRICK-YARD.

New Daguschahonda is the euphonious name of a little manufacturing village in Elk county, Pennsylvania, which might well be rechristened Bricktown, for Mr. W. S. Ravenscroft, one of the best known brick manufacturers of that section, has purchased the entire town, including store buildings, a saw and planing mill and other manufactories erected several years ago in boom times, but which have been idle for some time, little having been done in the town for the past few years, except the quarrying of valuable building stone. Mr. Ravenscroft, who is always on the lookout for valuable clay deposits, discovered that Daguschahonda offered excellent facilities for the manufacture of building and paving brick and, accordingly, purchased 250 acres of land, including the town site, with all of the houses and other buildings, machinery, etc., and has set about to turn the settlement into an immense brickmaking establishment. He is now busy installing a Simpson dry press equipment, including clay preparing machinery, screens, etc., and expects soon to be turning out a high-grade front brick. Later on he may add a paving brick outfit.

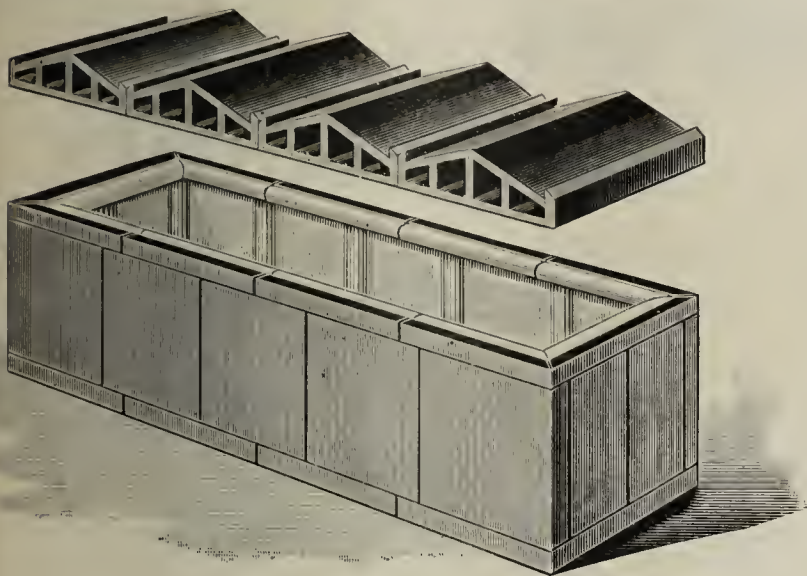
Ere long the little town will be quite a brickmaking center, as Mr. Ravenscroft is a hustler and thoroughly understands the exigencies of the business. We wish him every success, but sincerely hope, in the interest of those who may have to correspond with the residents of his town, that he will follow our suggestion and rechristen it "Bricktown" or "Clayville." Either, while commonplace and prosaic, would be an improvement over "Daguschahonda," which sounds too much like an echo from the Turkish frontier.

BUILT TO STAY.

An evidence of the superiority of clay shingles for roofing, writes a Southern correspondent, is the fact that on the great Vanderbilt estate, at Biltmore, N. C., all the buildings, except the mansion, are covered with tile, including the office, depot, school, church, rectory and four cottages. The tile and brick were made by machinery installed for the special purpose by Mr. Vanderbilt. The works closed about a year ago, there being enough material on hand to build a business block and other buildings, with about 50,000 tiling to cover same. The tile is a deep red color, with three and four dark splotches on each tile, one to three inches in size, which give a discordant appearance that Mr. V. seems to fancy. They are the Spanish roll pattern, and, when laid on the roof, this motley appearance is very much admired by every one. The architect for the above estate was the late R. M. Hunt, of New York, who was widely known by builders as having no superior, if an equal, as an architect in this country. His genius was displayed on some of the finest of the World's Fair buildings.

A NEW CLAY PRODUCT.

There is "no new thing under the sun," maybe, but Mr. Frank Kaufman, a well-known tilemaker of Rosedale, O., has invented and is introducing another clay product that is worthy of consideration. Notwithstanding the fact that the Chaldeans or some other of the ancients may have crudely used clay for a similar purpose some thousands of years ago, Mr. Kaufman is



Vault No. 2.

none the less entitled to credit for perfecting an ideal burial vault of burned clay, so designed that tile and brick manufacturers may easily add it to their list of products. Mr. Kaufman has favored us with a descriptive circular, from which we take the accompanying illustrations.

—Kaufman's Burial Vault, Patented Feb. 16, 1897.

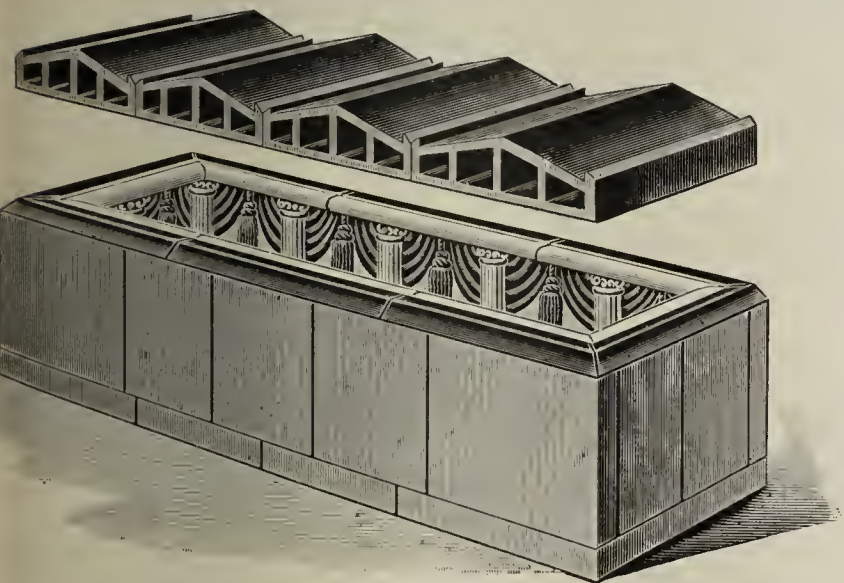
There has long been needed a burial vault which will exclude water, be impervious to burrowing animals, and indestructive, and at the same time add cheapness of construction to neatness of appearance. All this is accomplished by these vaults.

This vault is made of hollow sections of burnt clay; each section can be molded through a die and cut off in proper lengths, similar to drain tile.

The interior of all vaults is whitened with a special preparation and the exterior colored black.

This vault is similar in construction to No. 2 with the exception of a broader cap piece to extend over to catch a row of ornamental columns. In addition, the interior is artistically draped.

Desiring to have the Kaufman vault in use as early in the season as possible, I have concluded to dispose of the patent as a whole, by State rights or by royalty plan. Correspondence solicited immediately, as I have already had numerous offers to take



Vault No. 3.

it. As patentee and owner of this device, I am not in a position to manufacture the vault extensively, owing to other business and location. The fact that the vault can be manufactured in a number of grades, and each section can be molded through a die—the cheapest way to manufacture—is in itself a guarantee that there is big money in it. Canadian territory will also be disposed of.

Correspondence solicited. For further information, write for descriptive circular. FRANK KAUFMAN, Rosedale, O.

TABLE OF CONTENTS.

The Soft Mud Process.....	421	Salt Glazing Tile	472
Old Ben's Church.....	422	CORRESPONDENCE:	
In Deutschland.....	422	The New York Market	445
The National Association of		Setting Brick in Kilm.....	448
Stove-Lining Brickmakers...	425	A Brickmaker's Vacation.....	448
The Clayworking Industries of		A Good Man a Victim—An	
Victoria, Australia.....	426	Open Letter to A. R. Batley...	448
Reconstructed Granite Build-		Roof Tile—How to Make Them	449
ing Blocks.....	428	Measure of Damages for Breach	
Development of Hollow Block		of Contract to Furnish Brick	449
Manufacture	429	Southern Trade News.....	464
Chemistry for Clayworkers.....	430	Pacific Coast News... ..	466
A "Stilleish" Brickyard—in the		EDITORIAL:	
Land of Wooden Nutmegs....	433	Current Comment.....	458
Wants a Brick Grinder or Siz-		The Cost of Flimsy Building....	458
ing Machine	434	The Business Outlook.....	458
Obituary	435	The Flooded Region	459
The Potter's Art.....	436	Other People's Affairs.....	459
The Mendota Tile Company.....	438	Useless Exaggeration	459
The Brickmaker's Graveyard ..	438	Brick vs. Steel Construction....	459
Good Work in Chimney Mov-		"Papa" Melcher Now.....	460
ing.....	439	Moving of Tall Buildings	460
The Best Building, the Best		A Town Turned into a Brick-	
Brick and the Best Bricklay-		yard	460
ing.....	440	Built to Stay.....	460
Sioux City Wants a Paving		Editorial Notes and Clippings..	468
Brick Plant	440	MISCELLANY:	
Buttonhole Talks	441	Worth Repetition.....	434
Fire-Proof Construction	441	Brick and Love.....	435
Glazes	442	One Way.....	437
A Good Tile Machine.....	444	A Pleasing Prospect.....	464
A Free Scholarship in the Ohio		Materials of Construction.....	566
School of Ceramics.....	445	"Suggestions in Brick Work"...	466
An Interesting Experiment in		A New York Office	470
Setting and Burning Brick....	447		
An Old Establishment.....	447		
A New Clay Product.....	461		
Burning Tile.....	472		

Index to Advertisements on Next Page.

Books for...

Brickmakers.

"CLAY GLAZES AND ENAMELS,"	
Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	
Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	
J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	
Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	
H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	
J. J. W. Billingsley,	1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

INDEX TO ADVERTISEMENTS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page
Hilgeman H. B.	418	The American Clay-Working Machinery Co.	490, 491
Ross-Keller Brick Machine Co.	416	The Fernholtz Brick Press Co.	415
Simpson Brick Press Co.	414	Whitney, H. O.	418
The Chisholm, Boyd & White Co.	412, 413		

Brick and Tile Machinery.

Anderson F'dry & Mach. Wks.	496	Schoellhorn-Albrecght Mach. Co.	410
Balrd & Son, H. C.	477	The American Clay-Working Machinery Co.	490, 491
Brewer, H. & Co.	481, 493	The Horton Mfg. Co.	494
Central Machine Works.	476	The Eastern Machinery Co.	498
Chambers Brothers Co.	465, 409	The Henry Martin Brick Mach. Mfg. Co.	497
Chicago Brick Machinery Co.	462, 471	The Leader Mfg. Co.	487
Eagle Iron Works.	476	The Ohio Ceramic Engineering Co.	410
Freese, E. M. & Co.	492	The Turner, Vaugh & Taylor Co.	472
Hensley, J. W.	474	The Wallace Mfg. Co.	469, 499
Kells & Sons.	477	The Wellington Machine Co.	467
Means & Co., Jas.	477	Williams Patent Crusher and Pulverizer Co.	417
Michigan Brick and Tile Machine Co.	479	Wiles, A. M. & W. H.	482
Madden & Co.	473	Woolley Foundry & Machine Works.	495
Newell Universal Mill Co.	489	Williams, White & Co.	487
Potts & Co., C. & A.	419, 486, 489		
Raymond & Co., C. W.	463		
Stedman's Machine Works.	483		
Steele, J. C., & Son.	483		

Brick Kilns and Dryers.

Alsip, S. H.	483	Reppell, L. H.	481
Conley & Wolfe.	484	Sharer, Geo. W.	484
Cummer & Son Co, The F. D.	471	Swift, F. E.	481
Eudaly, W. A.	485	Thalson, A.	480
Leary, W. A.	478	The American Blower Co.	480
Morrison & Co., R. B.	485	The Fernholtz Brick Press Co.	415
Pike, E. M.	480	The Standard Dry Kiln Co.	420
Phillips, S. G.	481	Wolff Dryer Co.	500

Brick Yard Supplies.

Arnold, D. J. C.	488	Phillips & McLaren.	479
Coldewe & Co., G.	475	The Atlas Bolt & Screw Co.	473
Carnell, Geo.	482	The Buck Machine Company ...	477
Cox, Geo. S.	479	The Harrington & King Performing Co.	411
Caldwell, H. W. & Son Co.	472	The Keystone Brick-yard Supply Company.	476
Carmichael, T. W.	473	The Pittsburg Mineral Screen Company.	470
Hardin, Balley & Church.	474	Wagoner, M. V. B.	479
Marion Steam Shovel Co.	488	Walworth Run Foundry Co.	482
Mey, F. H. C.	474		
Mershon & Co., W. B.	411		
Newton, A. H.	475		

Miscellaneous.

Associated Trade & Industrial Press.	478	Jackson, John H.	478
Balsley, G. S.	477	Main Belting Co.	478
Dean Bros. Steam Pump Works.	476	Osborne, W. R.	477
Dover Fire Brick Co.	477	Tennille, A. F.	478
Evens & Howard.	479	The E. W. Vanduzen Co.	479
Hay & Willits Manufacturing Company.	486	The Union Hardware Co.	475
International Correspondence Schools.	481	The Jeffrey Manufacturing Co.	478
		The Rockwood Mfg. Co.	475
		Westbrook & Wells.	478
		Small Ads., Wanted, For Sale, Etc	

TO LEASE OR FOR SALE.

A PROPERTY containing five or six veins of coal measure clays of various colors, suitable for the manufacture of a tough, hard, vitrified paver and yellow or yellow and black mottled building brick. Property is opened and operated for coal. Is located in Maryland, on B. & O. Railroad, 208 miles from Baltimore, 182 miles from Washington and 308 miles from Philadelphia. Can also be opened on Pennsylvania Railroad at small expense. Freight rates on brick to the above cities considerably lower than from Wheeling, W. Va. Best quality of semi-bituminous coal for down-draft or closed kiln can be purchased for 75 cents per gross ton, or mined on the property by parties leasing. Stream within 100 yards. Address
PAVER,
Care Clay-Worker.



Great Opportunity

FOR SOME ONE

To get a High Grade Brick Plant for very little money. Why not for you?

Location gives easy access to markets of Chicago, Milwaukee, St. Paul, Minneapolis, Duluth and surrounding territory, connects with main trunk line.

320 acres of land, ten acres well stripped. Sheds filled with well seasoned clay for three to four million brick; 110 H. P. Buckeye engine, two boilers, two 4-mould Boyd Presses with all shafting, pulleys, etc.

Hotel and boarding house on premises, also three tenant houses, ice house, barn and livery stable, store, office building and blacksmith shop.

Owner engaged in other business. Write for particulars, and see how little cash will buy this fine plant. Easy terms to right party. Address

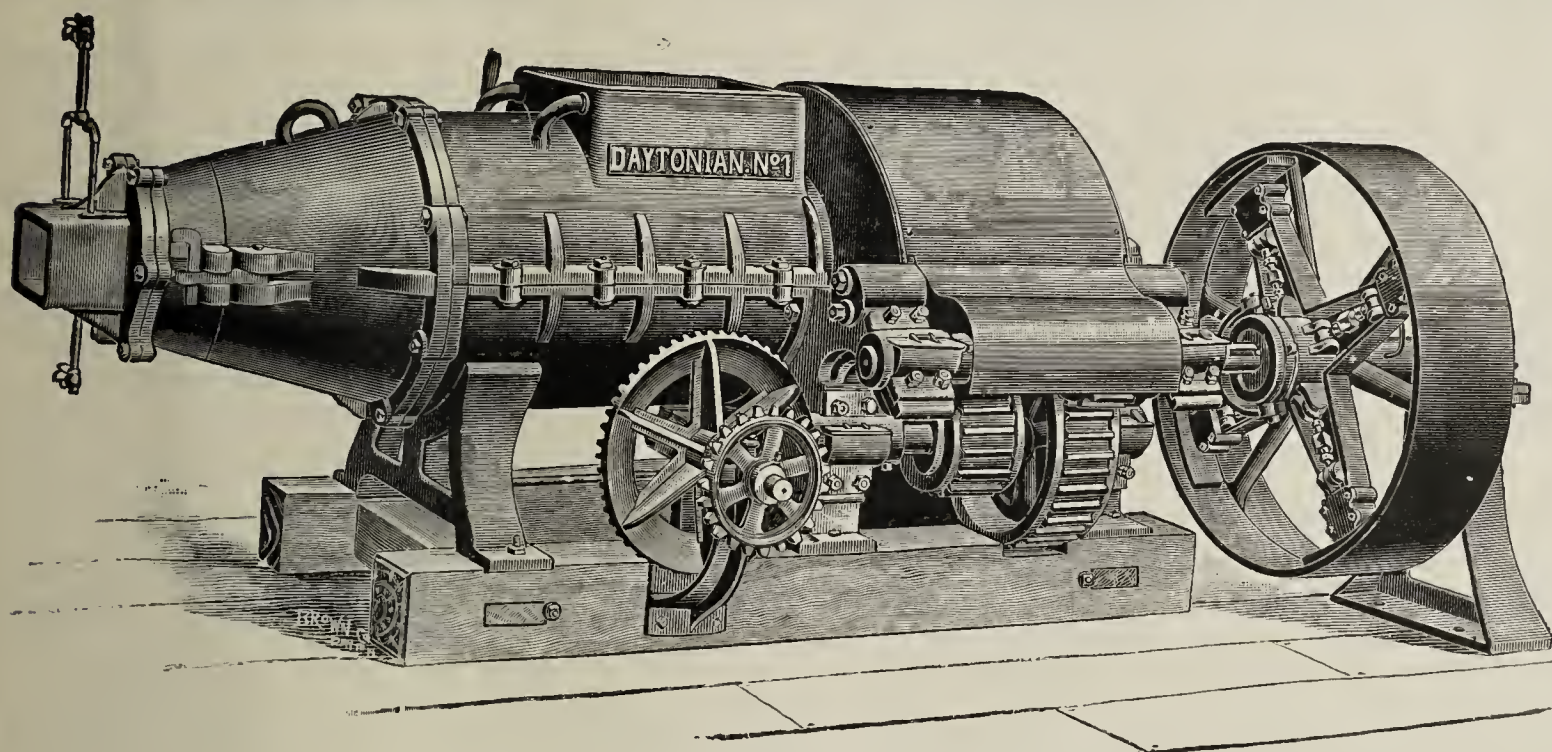
The CHICAGO BRICK MACHINERY CO.,

225 DEARBORN STREET.



Ask Your Grocer FOR Raymond Brick Machinery.

If he don't keep it, send direct to our factory, or request one of our Genial representatives to call and explain it. We guarantee he will not occupy your valuable time black-guarding our competitors; but will tell you wholesome truths about the best machinery on earth.



NO. 1 DAYTONIAN BRICK MACHINE.

Send us your name—our 1897 catalogue costs you nothing. It contains a complete list of Brick Machines. Cutting Tables, Brick Represses, Pug Mills, Clay and Ore Separators, Supplies, etc.

C. W. Raymond & Co.,

DAYTON, OHIO, U. S. A.

SOUTHERN TRADE NEWS.

Reports from Wheeling, Steubenville and New Cumberland indicate that the season is opening very satisfactorily for the pottery manufacturers, sales so far having been very pleasing. This condition may be due in part to the improved quality of the ware being furnished from this section of late.

Despite the fact that the Toronto (O.) Fire Clay Company is turning out 26,000 brick per day, and have more than a million in stock of brown, buff and mottled building brick, they are considering the increase of their plant's capacity.

Several new kilns are being added to the plant of the Great Western Sewer Pipe Works, at Steubenville, O., their present outlay proving entirely inadequate to handling the pipe and brick output of the plant.

A movement to start the North Wheeling (W. Va.) Pottery is being promoted by F. F. Shafer, formerly with the Wheeling Pottery Company, associated with Ohio parties.

John B. Buss has arranged for the establishment of a brick works, to cost \$15,000, at Baden, Mo., the work to begin actively on the construction of buildings at once.

Crowell & Co., of Bristol, Tenn., have been exceptionally fortunate the past winter in securing contracts for this season's building, and will have something like 100,000 brick to furnish for school, courthouse and jail buildings in Virginia and West Virginia.

The Central City (W. Va.) Brick Company has secured the contract for supplying the brick for the proposed new college building to be erected during the summer at Ceredo, W. Va.

The Portsmouth (O.) Fire Brick Works continue active, with a daily capacity of 38,000, and shipments ranging from four to six cars per day. This is one of the most active companies in southern Ohio, and its product is unsurpassed in quality.

The Wheeling (W. Va.) Pottery Company manufactured the china service for the new gunboat Wheeling. It consisted of two shapes, one of which was for the Captain's room, the other for the ward room. Both were in La Belle china, and labeled underneath, "Presented by the City of Wheeling, W. Va." The shape for the Captain's room was decorated in Royal La Belle blue, all hand work, the design being cable and knot, with the inscription, "U. S. N." on each piece. On the large fish plate is a picture of the suspension bridge and upon a large platter a representation of the city building, both being surprisingly accurate. The ward-room service bore a beautiful green festooning, gold-traced edge and anchor.

The Kentucky Fire Brick Works, of Portsmouth, O., works located at Indian Run, Ky., are having a fine demand for their vitrified shale street-paving brick, and operating to their full capacity of 30,000 per day.

The demand for sanitary pottery this season so far has been better than in several years, and a greater amount of work is being done in this department of most of the upper Ohio valley works.

Middlesboro, Ky., capitalists who are interested in the flint clay mines at Mount Vernon, Ky., are preparing for working them on a larger scale than ever before attempted, and will make an effort for the supply trade of the Alabama and Tennessee fire-brick yards.

Harper & Trende, red brick manufacturers, of Portsmouth, O., have dissolved partnership, and Frank Trende will establish another yard at that point, backed entirely by himself.

The Peninsula Brick Company, of Wheeling, W. Va., has been incorporated, with a capital stock of \$50,000, by J. B. Gordon, William Romm, W. T. Row and James McFadden. They will manufacture fire brick and tile.

The Pioneer Pottery, at Wellsville, O., which but recently resumed operations after quite a long idleness and extensive repairs, is having all the work it can handle, and working double turn to meet its orders.

The Reed Brick Works, of Abbeville, Ga., are preparing to operate new clay banks, to which it will be necessary to put down quite a stretch of narrow gauge railroad.

The new art pottery at Mingo Junction, O., of which Carl Dangler, formerly of Steubenville, O., is to be Manager, is now practically complete, and operations are to begin without delay. It is modernly equipped throughout, and promises to be one of the most substantial institutions in that section.

The mottled building brick manufactured by the Toronto (O.) Fire Clay Company are meeting with great demand, especially in the East. The company is furnishing material for the frontage of twenty-nine new residence buildings in Philadelphia.

The negotiations for the purchase of the Chelsea Pottery, at New Cumberland, W. Va., are still pending, and an agreement is expected to be reached early next month. Pierce Curby, late Manager of the Akron Pottery, and Thomas Price, formerly of the Chelsea, are among those interested.

Experiments are being made at the Ironton (O.) Fire Brick Works, that are now running only in part, with sample clays brought from Japan. The product will be red brick, and, in the opinion of the workers, stock of exceptional quality. The experiments are, of course, for the benefit of proposed Japanese ventures.

Katterjohn & Sons' brick works, at Paducah, Ky., have resumed operations, after several months' idleness, with considerable of a stock of advance orders in hand.

The English Mining and Manufacturing Company, of Jackson, Mo., are equipping a plant with the latest brick and tile machinery, and will operate extensively. Their clay mines will be reached by railway.

The McElfresh Clay Manufacturing Company, of Steubenville, O., contemplate the early general overhauling and improvement of their immense plant, together with the addition of new and latest improved machinery.

Thomas Davison, of Wheeling, has arranged for the establishment of a factory for the manufacture of porcelain and semi-porcelain ware at that point.

The Mason City (W. Va.) Brick Works, under the management of George Vogelgesang, are in steady operation, making an average of 15,000 red and paving brick daily, and enjoying a good demand. A shipment of 50,000 pavers went last week to Vanceburg, Ky.

The Globe Brick Works, at New Cumberland, W. Va., sold last week at public sale, were purchased by James Porter for \$15,500, Mr. Porter having been a part owner of the plant previously. It is not stated what will be the result of the sale.

C. O. L.

A PLEASING PROSPECT.

Prominent among the Ohio manufacturers of clayworking machinery is the Webster, Camp & Lane Machine Company, of Akron, O., having a full line of patterns for all the machinery required for complete plants for the manufacture of sewer pipe and stoneware. Being pioneers in the manufacture of this class of machinery, they are well fitted to give their customers the benefit of an extended experience. Their sewer pipe presses are made from modern patterns, designed for easy handling and convenience of repair, of the best material, and all parts fitted to standard gauges. They are also provided with a power cut-off suitable for all sizes of pipe, together with an improved steam dummy for locking and unlocking the dies. Their line of die patterns is complete for all sizes of standard and double strength pipe, also deep socket pipe. The patent curve and elbow dies manufactured by them are easily adjustable to make either straight or curved pipe of any radius suitable for size of pipe being made. They also have a full and complete line of patterns for trap dies, flue lining and coping dies. The dies are all carefully made of the iron best calculated to give long life, and are carefully finished to give the best flow to the clay in forming the pipe. They have also a variety of plans for press feeders and clay carriers, which can be arranged to suit almost any conceivable conditions. For the preparation of the clay they manufacture dry and wet pans, driven by their own patent band friction clutches. They can be arranged for driving either by belt or gearing, when gearing is used, the design of gear being such as will give quiet running, combined with strength and long life to the gears. For the manufacture of stoneware their line of pull-downs and jiggers is the best, the range of sizes running from the smallest pot to a twenty-gallon crock, the heavy double pull-down being a model of its kind for rapid and easy action. This, combined with their heavy self-contained jigger, which is driven by powerful friction clutches, makes an ideal machine. It is also provided, when desired, with a friction disk, giving a means for readily varying the speed to suit different sizes of ware. In addition, they build filter presses, blungers, agitators, slip pumps and tubs, and everything required for a first-class and complete plant. Being also manufacturers of the Akron Corliss engine and the Akron automatic engine, they are especially well fitted to estimate on a complete equipment, including boilers, line shafting, pulleys and special machinery for the manufacture of either sewer pipe or pottery ware. In addition to above machinery, this company builds hoisting and hauling machinery which is well adapted to transporting the clay from bank to factory. Business with the Webster, Camp & Lane Company is good, and the year 1897 bids fair to be one of the most prosperous in the company's history.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

DECISION IN FAVOR OF CHAMBERS

IN THE

Infringement Suit Against J. W. Penfield & Son

ON

Brick Machine Patents Owned by Chambers Bros. Co.

PHILADELPHIA, PA.

NOTICE

To the Public Generally and to Manufacturers and Users of Wire Cut-off Brick Machines Especially.

After a protracted litigation, in which the defendants, with the aid of able legal counsel, contested every point and raked Europe and America to find something that would defeat our patents, the **United States Circuit Court at Cleveland, Ohio**, in the suit brought by us against J. W. Penfield & Son, has sustained as good and valid all of the essential and important claims in suit covering the endless belt or carrier and the wheel wire cut-off Brick Machines of our basic patents, No. 297,671, No. 297,917, and No. 362,204, besides certain claims for minor features of construction of these and other of our patents.

We are advised by our counsel (Joshua Pusey, Esq., of this city) that all machines constructed or used, without license from us or our predecessors, and operating on the principles of the endless belt or carrier machine of patents Nos. 297,671 and No. 297,917, are infringements of said patents.

Also, that all such unauthorized wire cut-off machines having a rotating wheel carrying cut-off wires and having a cam, or cams, for guiding, or regulating, the movement of the wheel so that the wires will take their proper path through the moving bar of clay in severing the latter into bricks, and means for causing the cut-off wheel to move in unison with the bar, are infringements of patent No. 362,204.

Also, that all such unauthorized machines having in combination with the cut-off wheel and the cam, or cams, a positively driven friction belt, for aiding in driving said wheel, are infringements of the last mentioned patent.

Also, that all such unauthorized machines having endless belts or carriers, or wheels, with U-shaped elastic bows secured thereto, for holding the cut-off wires, infringe, respectively, patents Nos. 297,671, and 297,917, and 362,204.

All manufacturers and users of Brick Machines infringing the said patents and claims of other of our patents that were adjudged to be valid in the case against J. W. Penfield & Son will please take notice that we intend enforcing our rights in said patents and in all others owned by us.

CHAMBERS BROTHERS COMPANY,
Fifty-second St. below Lancaster Ave., Philadelphia, Penna., U. S. A.

PACIFIC COAST NEWS.

The condition of the terra cotta and brick trades is quiet in the extreme. A well-known dealer, in summing up the situation, said that in his opinion there are altogether too many brick and terra cotta establishments on this coast for the population and amount of business. This may be true, too, but whatever the cause, a long-lasting depression reigns supreme, with slight prospects of an early change. Contracts are very few and far between, the most important of the recent ones, however, being the fire-proofing and terra cotta trimmings on the Examiner's new building, the amount being \$17,000, and the enameled tile work in the court of the Alliance Assurance Company's building for \$4,000. Both of these contracts were secured by Gladding, McBean & Co.

N. Clark, the senior member of the firm of N. Clark & Sons, of the West End Potteries, Alameda, Cal., died recently at his home in Sacramento, Cal. The deceased was a California pioneer, and was sixty-seven years of age. He first established his potteries near Sacramento in the early days, and has been actively engaged in the business for the past forty years. He leaves two sons, one of whom, George D., has for some years past attended to the business end of the pottery enterprise.

Thomas Connell, assignee of the Oregon Pottery Company, at Portland, has applied to the court for an authorization to dispose of the assets of the company to the highest cash bidder. The company has been in serious financial difficulties for some few weeks past.

In the new hall of justice to be erected in this city 2,000,000 bricks will be used.

L. W. Ridenhour, proprietor of the Russian River (Cal.) Brick Works, died recently at his home near Guerneville, Cal.

A. O. Fowler has started a new brickyard at Davenport, Wash., which will turn out from 16,000 to 20,000 bricks per day.

The case of the Utah Portland Cement Company vs. the Centerville Brick Kiln Company is before the court in Salt Lake, Utah. The plaintiff sued to recover \$15,000 damages, alleged to have been sustained by the defendant furnishing a defective kiln, which did not work so as to make good brick.

A red clay-like substance has been discovered in the Mojave Desert, California. The discovery is, in fact, a natural soap, and it only needs to be put into shape for the market to command the highest price of that article. There is no making over to be done, for it is perfect in its natural state. A small bit placed on a black, greasy railing, and then moistened, cleaned the paint to a whiteness that no manufactured article could ever excel. The peculiar property of the clay, for it can best be described as that of nature, was discovered when the prospector, Thomas McFarlane, in seeking water, built a little dam of the clay to raise the water sufficiently to allow the horses to drink from a small rivulet. He threw up the dam, only to have it melt away rapidly and dissolve. He made a careful examination and trial of the wonderful compound, and found that he had discovered nature's own soap factory. Although a clay, he has tried the soap on silverware and there is not the slightest particle of grit in it to scratch the silver, but is the softest and most pliable of soaps, suitable for use in any place where the finest and most choice qualities are required. Samples will be sent to all the leading chemists of the country to have the soap thoroughly analyzed. A few friends of the fortunate prospector have gone in with him, and will at once file articles of incorporation according to the laws of the State, with the following stockholders: Thomas McFarlane, one-half interest; T. J. West, Joseph Rich, W. D. Wagner, Charles Klein, George Boren and one more, each one-twelfth.

The Auburn (Wash.) Pottery has purchased the flower-pot molds formerly used by the Sidney Pottery Works, and will add the manufacture of flower pots to the various other kinds of ware they make.

Quite a large real estate transfer is reported on the East Side, in Portland, Ore. Fifteen acres of land on the Sandy road has been sold by Mrs. Lydia Buchman to E. Versteeg for the sum of \$6,000. The land was purchased for the purpose of starting a brickyard, and work will shortly be commenced. The ground is inside the city limits, and is well suited for the purpose. There are other brickyards in the same neighborhood, all of which will probably be operated.

A valuable specimen of ancient pottery was found recently by W. A. Daggs on his ranch near Mesa, Ariz. It is a neck-shaped olla, evidently a burial urn of the prehistoric race that formerly peopled that region, and is in a good state of preservation. The vessel is perfect except the earthen cap or cover, which is cracked. The bowl is fourteen inches in diameter and twelve inches deep, and contains the ashes of some departed ancient. It has been added to the extensive collection of curios owned by Dr. G. A. Scroggs.

W. E. Clark and B. W. Clark have filed suit against John Doe Garibaldi and Mariam Doe Garibaldi to recover the possession of a kiln of burnt brick, containing 25,000, and 100,000 green brick, located in the brickyard of C. Forrester, in the Chavez Canyon, Los Angeles, Cal.; also shovels, molds and all other brickyard tools on the premises. The sum of \$500 is also asked for as damages for the unlawful detention of the property.

William McMahon has begun the manufacture of brick at Glendive, Mont.

Frank Sharples has the contract to burn 175,000 brick to be used in erecting a depot for the Valley Railroad in Hanford, Cal.

SUNSET.

MATERIALS OF CONSTRUCTION.

It is our pleasure to again call the attention of the readers of the Clay-Worker to another work by Prof. J. B. Johnson, professor of civil engineering in Washington University, in St. Louis, Mo. The work under immediate consideration is entitled "The Materials of Construction, a Treatise for Engineers on the Strength of Engineering Materials." It will be remembered that we recently reviewed another work by Professor Johnson on "Engineering Contracts and Specifications." Mr. Johnson has also produced, among other valuable works, one of especial interest at this time on "The Practice and Theory in the Designing of Modern Frame Structures." The book, "Materials of Construction," carries in its title the general purposes of the work. It takes up all possible structural materials and thoroughly analyzes all of their qualities under varying conditions, which might come to them as structural material. Thus, we find iron and steel in their various forms thoroughly and exhaustively considered, together with their various alloys. Limes, mortars and cements are considered in a highly scientific manner. The properties of timber probably never had a more satisfactory analysis from an engineering standpoint. The consideration of testing machines and the testing of various materials occupy several hundred pages in this book. The attention given to tests of brick indicates the care and thoroughness of this work.

This book is published by John Wiley & Sons, of New York, contains 787 pages and sells for \$6. It is unquestionably a complete and reliable work.

"SUGGESTIONS IN BRICK WORK."

Some books are pretentious without being beautiful, and others are beautiful without being pretentious. The book, "Suggestions in Brick Work," with illustrations from the architecture of Italy, together with a catalogue of bricks made by the Hydraulic Pressed Brick Company is of the latter class—an exceedingly beautiful, neat, chaste piece of work. It is along the line of educational work which cannot but result in the betterment of our architecture.

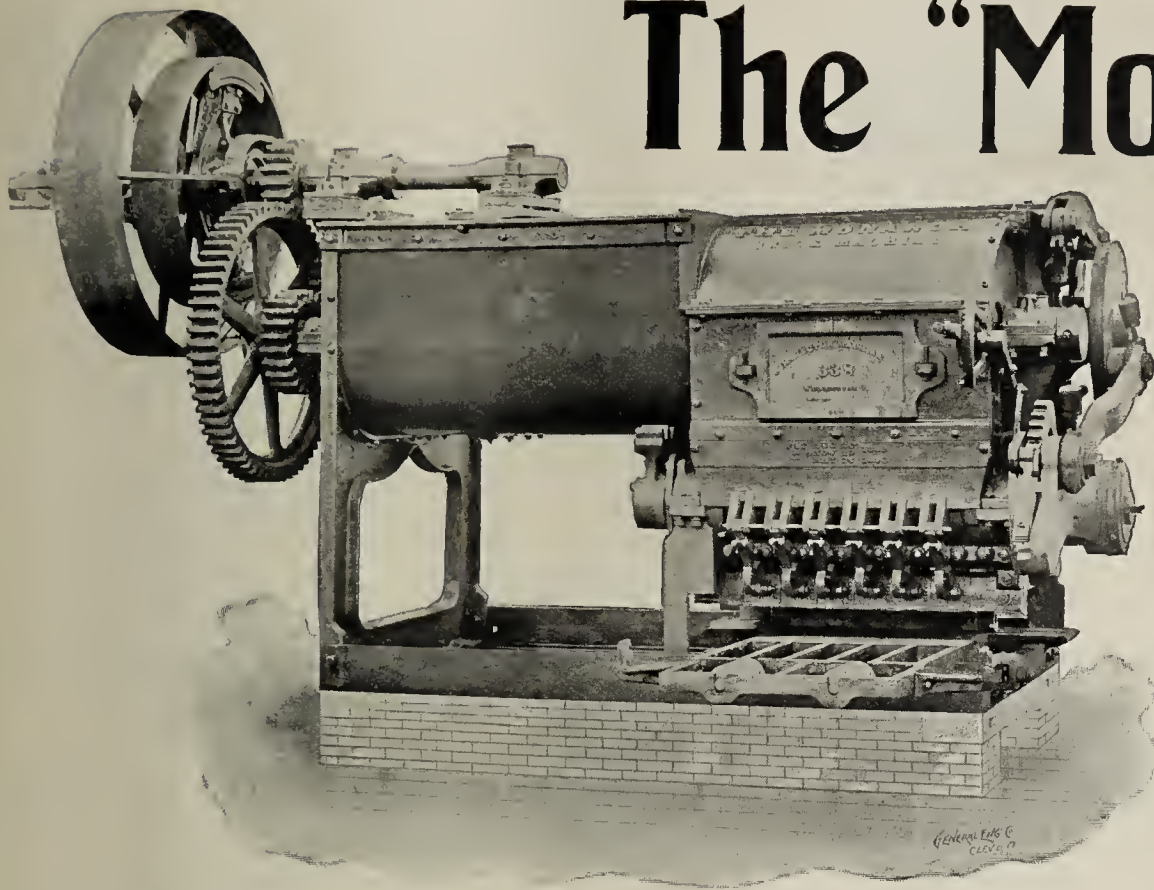
This is an exceedingly practical work. While it gives beautiful examples of foreign work, it does yet more when it indicates how beautiful work can be executed with brick made by the Hydraulic Pressed Brick Companies. The selected Italian illustrations are inspiring, and the catalogue of domestic work is practical.

Nearly all molded brick made is ugly. Most of the patterns have hitherto emanated from crude sources, and the work done in ornamental and molded brick has been pretentious, tawdry and ugly. There are some notable exceptions to this condition, and we are happy to see that the Hydraulic Pressed Brick Company is now securing artistic patterns. Most Western architects who care anything for their reputation have refrained from using molded brick because the patterns were unworthy. Now, however, there is an opportunity for a change, though the yoke of ugliness must yet, for a time, cling to the molded brick idea. People have seen so much of this kind of commonness that they will be slow to respond, even when the genuine article is furnished them. The architects, however, will be helpers.

LIABILITY IN USE OF DANGEROUS MACHINERY.—

Where the negligence complained of is the failure of the master to properly instruct an inexperienced servant as to the use of a dangerous machine, and it is shown that proper instructions were not given—that the servant was without experience, that the master knew of the dangerous character of the machine, and that the dangers were apparent only to an experienced man—the rule that the servant assumed the risks incident to the employment does not apply. (American Strawboard Co. vs. Foust, Appellate Court of Indiana, 39 N. E. Rep., 891.)

The "Monarch"



(Horizontal,
Double Pug Mill,
Double Press.)

... and ...

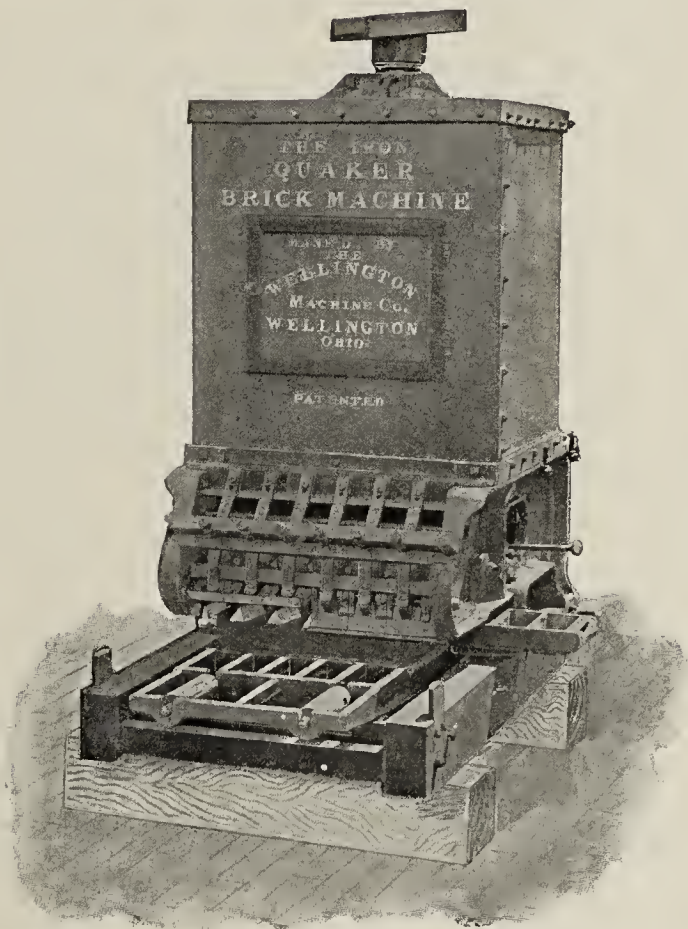
— THE —

"Iron Quaker" Brick Machines

Lead the "Sand-Moulding" Class.

AUXILLIARY
MACHINES
AND . . .
SUPPLIES.

Pug-Mills, Disintegrators, Crushers,
Mould - Sanders, Represses, Winding
Drums, Dump Cars, etc., Moulds, Dump
Tables, Dryer Cars, Kiln Doors and Cast-
ings, Elevators, Dump Carts, etc., etc.



Ball-Bearing Brick Barrows and Trucks.
No one else makes them.

FOR SALE.

Odd sizes of moulds. Have not been used.

5 moulds, $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
20 moulds, $8\frac{13}{16} \times 4\frac{3}{16} \times 2\frac{7}{16}$. 9-16 in. partitions.
12 moulds $9\frac{5}{8} \times 4\frac{5}{8} \times 2\frac{1}{2}$. $\frac{1}{2}$ inch partitions.

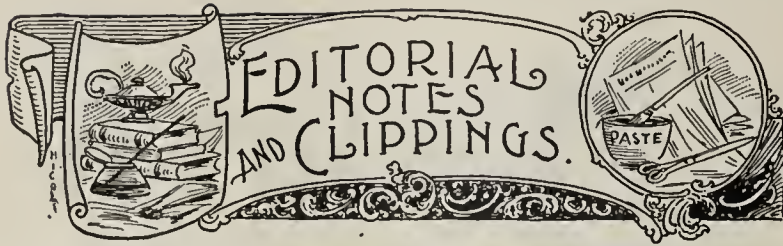
Second-hand, but used a few days only.

10 moulds, $9\frac{1}{2} \times 4\frac{9}{16} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
19 moulds, $9\frac{1}{2} \times 4\frac{5}{8} \times 2\frac{9}{16}$. " "
16 moulds $9\frac{1}{4} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 inch partitions.
16 moulds $9 \times 4\frac{1}{2} \times 2\frac{1}{2}$. 9-16 inch partitions.

The Wellington
Machine Co.,

Send
for
Circular.

WELLINGTON,
OHIO.



Jos. Files will start a brick plant at Rutland, Vt.

Will Clarke will erect a tile factory at Spring Prairie, Wis.

Norris Bros. will establish a new brick plant at Jackson, Tenn.

Ignatz Bross will manufacture brick at Waseca, Minn., this season.

A brick plant will be started at St. Joseph, Mo., by F. P. Halsey.

Jos. Hayden expects to go into the brick business at Smithfield, Pa.

Addison, Mich., is to have a new brick and tile plant in the near future.

B. T. Harwood will manufacture brick at Uniontown, Ala., this season.

Chas. Smith and R. A. Armstrong will establish a brick plant at Wharton, Tex.

Daniel J. Donaghy has purchased the brick plant of H. G. Beaumont at Hartford, Conn.

R. C. Fritz, of Belvidere, Ill., will open a brickyard about three miles out from that city.

David McAllister contemplates putting in a new steam drier at his brick plant at Newton, Ia.

G. B. W. Foust, of Altoona, Pa., is looking for a site on which to erect a steam brick plant.

Chas. A. Carlisle has purchased the brick plant at Exeter, N. H., formerly owned by Janelle Bros.

A brick yard will be started at Long Prairie, Minn., in the near future by Neal St. Anthony, of Clarissa.

M. Butler, Houston, Tex., writes that he would like to correspond with manufacturers of iron or steel pallets.

Ezra Peltier and Wm. Morgan are making preparations to open up a brick yard just east of Morristown, Minn.

The brick works at Sparta, O., have resumed operations under the management of Walker & Cook, the new owners.

J. L. Carney and D. W. Filer have leased the Enreka (Ill.) Brick Works, and will manufacture brick there this summer.

Howard & Hand are remodeling their brickyard at Rome, Mich., putting it in shape to run full-handed the coming season.

Rickabaugh & Parleman write that they have just started a new plant at Newtown Square, Pa., for the manufacture of brick.

The Portage (Wis.) Brick Company has been incorporated by A. E., F. P. and J. M. Drinker, with a capital stock of \$75,000.

Rayburn & Porter, Montezuma, Ia., want information as to where they can obtain terra cotta stakes for marking lots in cemeteries.

The plant of the Logan (O.) Brick Company was sold recently to J. J. Snider for \$5,000. The original cost of the plant was \$48,000.

J. M. Stetzel, 385 West Thirteenth street, Peru, Ind., is in the market for something entirely new in ornamental and glazed sidewalk brick.

S. L. Chapman is remodeling the brick plant at Sackville, N. B., which he expects to have in good working operation by the 15th of May.

F. Magnuson, New Denver, B. C., Canada, writes that he wants to put some machinery in his brick plant, and would like to receive catalogues, etc.

Hardin Taylor, a brick manufacturer, of Biddeford, Me., died of heart failure April 27. Mr. Taylor had been engaged in the brick business since 1854.

The Montreal (P. Q.) Pottery was almost completely destroyed by fire May 5. The cause of the fire is supposed to have been an overheated oven.

The Canton (O.) Brick Company and the Cleveland Vitrified Pressed Brick Company, of Cleveland, have consolidated under the name of the Canton and Cleveland Brick Company, with works at Canton. They have a capital stock of \$200,000,

and will manufacture paving brick and block and sewer, sidewalk and building brick. The annual capacity of the plant is 25,000,000.

E. N. Weigel, Manager Standard Brick Works, Little Rock, Ark., would like to communicate with a good brick setter, capable of setting about 20,000 brick a day.

The Geo. Robinson Brick Works, at Bellaire, O., have no occasion to complain of hard times, as the plant is running to its full capacity and is behind with orders.

The Dallas (Tex.) Brick and Construction Company has been incorporated for the manufacture and sale of brick. W. J. Bassett, C. C. Clark and M. W. Russey are interested.

The Phoenix Brick Company is the name of a new company organized at Atchison, Kan., with \$9,000 capital. F. P., E. T., A. M. and F. E. Halsey and J. A. Waggener are interested.

Jno. A. Easton, Greenfield, Ia., writes that there is a splendid chance for a good man to start a brick and tile plant at that place, as he would find no trouble in selling his product.

A very fine deposit of clay has been discovered at Grenada, Tenn., suitable for the manufacture of pressed and ornamental brick. A company will probably be organized to work same.

The West End Brick Company, of Allentown, Pa., has been chartered. The incorporators are John Bowen, Harry C. Trexler, James K. Bowen, John J. Yingling and Frank M. Trexler.

Natural gas has been struck at Iola, Kan., and the Iola Brick and Tile Company will adopt same for burning the product of their new plant, which they are rapidly pushing to completion.

The Riverside Brick Company has been incorporated at Syracuse, N. Y., by W. W. Porter, S. S. Ruston, C. F. Brockway, Chas. Foreman and J. M. Sherwood. The capital stock is \$30,000.

F. P. Hadgdon & Co., of Eliot, Me., in a recent letter, say they have started their brick plant for the season, turning out 15,000 per day, but that they expect to double this capacity later in the summer.

J. H. Harrison, of Mineral, Ill., reports a good trade in the brick and tile business. He is also interested in brick and tile plants at Princeton and Bedford, Ill., and says the prospect is bright for the coming season.

Old Town, Me., wants a good brickyard. One of the local papers says: "The man who can discover clay and engage in the manufacture of brick in Old Town will have a good market for all the brick he can make."

Dr. J. R. L. Clarkson, Dr. Thos. Irwin and F. D. Crow have purchased the plant of the Star Brick Company, Moberly, Mo. It is the intention of the above-named gentlemen to at once put the works in shape to run at its full capacity.

The Coffeyville (Kan.) Vitrified Brick Company advise us that they are in the market for two hundred iron drying cars and two thousand feet of T rails, second-hand, and will be glad to correspond with parties who can furnish same.

Jno. Emmmer, New Iberia, La., advises us that he wishes to purchase two cherry brick molds, plate bound on both sides, bottomless, for molding brick 9x2½x4½ inches. He would like to have some one quote him price on same C. O. D.

J. Johnson writes that he desires to start a brick plant and is looking for a good site for same. He says he is a practical brick man, has necessary machinery and can furnish the best of reference. Mr. Johnson's present address is Millsdale, Ill.

R. L. Patterson, Austin, Tex., writes that he is going into the brick business, and would like to receive "catalogues, price lists, etc., of all kinds of machinery necessary for the equipment of a brick plant." Mr. Patterson's address is 604 Long avenue.

While John Malnowski was undermining a clay bank at F. H. Eggers's brickyard, in Cleveland, O., a mass of clay fell in on him and completely buried him. He was dug out a few moments after, but died almost immediately, his neck having been broken.

H. Diefenthaler writes that the Millbury Brick and Tile Company is the name of a new firm recently organized at Millbury, O., for the manufacture of brick, tile and hollow blocks. They expect to have a daily capacity of 10,000 brick, 10,000 tile and about 4,000 hollow block.

The Brick Manufacturers' Exchange has been incorporated at Baltimore, Md., for literary and social purposes. It will be conducted on the principle of the Builders' Exchange, and will be governed by a board of nine directors. The list of members includes all the well-known brick men of Baltimore, such as Noble H. Creager, John W. Stallings, Charles H. Classen, Wil-

[CONTINUED ON PAGE 470.]

BRICK MACHINERY**Wonder No. 4.**

Capacity, 60,000 to 100,000 per day.

Big Wonder.

Capacity, 50,000 to 60,000 per day.

Intermediate Wonder.

Capacity, 25,000 to 40,000 per day.

Little Wonder.

Capacity, 20,000 to 25,000 per day.

BRICK CUTTERS**Cunningham's Side Cut
Automatic Cutter.****Cunningham's End Cut 3-Stream
Automatic Cutter.****Cunningham's End Cut 2-Stream
Automatic Cutter.****Cunningham's End Cut 1-Stream
Automatic Cutter.****Side Cut Broad Delivery Table.****Hand Brick Cutting Table.****Combination Side and End Cut
Hand Brick Cutter.****PUG MILLS****No. 3, Plain Closed Top Pug Mill.****No. 3, Open Top Pug Mill with
Wallace Patent Cleaner Teeth.**

Tempers clay for 75,000 to 100,000 brick per day.

No. 2, Open Top Pug Mill.**No. 2, Closed Top Pug Mill.**

Tempers clay for 35,000 to 50,000 brick per day.

No. 1, Open Top Pug Mill.**No. 1, Closed Top Pug Mill.**

Tempers clay for 25,000 to 35,000 brick per day.

No. 1, Wallace Patent Pug Mill.**No. 2, Wallace Patent Pug Mill.**

Tempers clay for 20,000 to 40,000 brick per day.

DRAIN TILE MACHINERY**Little Wonder Makes 3 to 12 inch.**

Capacity, 8,000 to 12,000 4-inch daily; others in proportion.

**Intermediate Wonder Makes from
3 to 18 inch.**

Capacity, 10,000 to 15,000 4-inch daily; others in proportion.

**Drain Tile Cutting Tables for large and small tile
Trucks for Handling Large Tile.****Reversing Device for large tile.****CLAY PREPARING MACHINERY****Dry and Wet Pans, 6, 8 and 9 feet, with wood
and iron frames.****Clay Screens.****Clay Crushers and Stone Separators of
many designs and capacities to suit
conditions.****Clay Elevators all lengths and widths
to suit your desire.****Dry Clay Bucket Elevators of length and
breadth to suit desires.****Friction Hoisting Drums.****Friction Geared Hoisting Drums.****Clay Cars. Truck Wheels and Axles.****Kiln Doors and Frames.****Kiln Doors without Frames.****Wheelbarrows for Brick and Tile.****Brick Pallet Spring Trucks.****Engines. Boilers. Pumps.****Shafting, Pulleys, Hangers,
Couplings, Journal Bearings and
Belting, both Rubber and Leather.**

Look Down the Line



We are prepared to furnish any and every appliance needed in an up-to-date Brick or Tile Plant. Let us QUOTE you prices. It will only cost you two cents, and may save you MANY DOLLARS.....



Wallace Mfg. Co.

Frankfort, Indiana.

See Back Inside Cover Page.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

liam Schwarz, Grafflin Cook, Wm. H. Hartlove, August Weber, John J. Hoffman, Joseph R. Wilson, William Deshields, George M. Bokee, Albert D. Klein, John H. Foss and Richard Cromwell, Jr.

Jas. McGinley has purchased the plant of the Wheeling (W. Va.) Brick Company. He will make extensive improvements in same, and in all probability add a sewer pipe plant. The firm will hereafter be known as the Peninsula Brick Company.

N. Erieson, an employe at the Purington Paving Brick Plant, Galesburg, Ill., was quite badly injured by being struck on the head by a large timber while he was assisting in putting a frame in the crown of a kiln. His left jaw was crushed and several teeth knocked out.

Henry Katho, a lad employed at Valentine's brick factory, Woodbridge, N. J., recently had all the fingers of his right hand cut off in a brick machine he was tending. After the physician had dressed his hand he cried, not because of the pain, but because he could not play ball this summer.

T. W. Carmichael, manufacturer of the Carmichael clay steamer, says he has sold nine steamers this season, one of his last shipments being a second order from the Alumina Shale Brick Company, of Bradford, Pa., who state the first steamer is working in an entirely satisfactory manner.

Baske & Donaldson have purchased the brickyard at Davenport, Ia., and have a large force of men at work getting the plant ready for operation, and will soon be turning out brick. Mr. Donaldson is a brickmaker of many years' experience, and there is no doubt as to the success of the new firm.

J. P. Dunnington, Oil Trough, Ark., writes that he wants to contract with responsible party to make ten to fifteen miles of six-inch drain tile. Wants to make the tile there, as the freight rate is too high to justify shipping. Has a good quality of clay. Parties interested are requested to write him direct.

Superintendent Johnson, of the Home for Feeble-minded Children at Fort Wayne, Ind., has remodeled an old brickyard, and will manufacture brick this summer to be used in making extensions to the home. Mr. Johnson says the cost to the State will be comparatively small, as most of the work will be done by inmates.

Bernard Gunn, one of the pioneer brick manufacturers in Philadelphia, Pa., died at his home in that city April 27, aged seventy-three years. He had been engaged in the brick business fifty years. He retired from active business life in 1893, and was succeeded by his sons. Mr. Gunn was an old-time member of the N. B. M. A.

Fire at the plant of the Mechanicsville (N. Y.) Brick Company caused a loss of \$20,000 April 25. It being Sunday, there was no fire in any part of the works, so it is supposed to be the work of incendiaries. All the machinery was so damaged as to be almost worthless. Mr. Geo. B. Perry, President of the company, says they will rebuild at once.

J. C. Steele & Sons, Statesville, N. C., write that they have greatly increased their capacity, and are continually extending their trade. They have recently shipped machines to Maryland, Tennessee, North Carolina, South Carolina, Georgia, Alabama, Texas and West Virginia. Automatic tables almost always furnished and give satisfaction in every instance.

The Christy Fire Clay Company will be represented among the glass trade by Mr. Vincent P. Ring, whose experience in clayworking and brick manufacture, together with his practical knowledge of mechanical construction, will enable him to intelligently consider the needs of the trade, as well as to properly advance the interest of the Christy Fire Clay Company.

J. B. Dunlap, Business Manager of the Shikaska Valley Brick and Tile Works, Blackwell, O. T., writes that he has manufactured brick by hand for twelve years, but that he is now equipping the above plant with auger brick and tile machines and building up and down-draft kilns, and expects to have a capacity of 25,000 brick and tile daily. Hopes to start operations in his new plant by the middle of the month.

We are advised by the Griffin (Ill.) Clay Manufacturing Company that they have secured Mr. Geo. Dickinson, formerly Superintendent of the Laeade Fire Brick and Sewer Pipe Company, of St. Louis, to fill the position heretofore held by Mr. A. R. Batley. They say: "We are now pushing our fire brick department. Our fire brick, by actual tests at different rolling mills, are pronounced equal to the Mount Savage or Woodland fire brick."

W. J. Woolley, proprietor of the Woolley Foundry and Machine Works, Anderson, Ind., writes that a brief sojourn at Martinsville, Ind., nearly cured him of rheumatism, with which

he was suffering severely—in fact, was almost helpless, being "stiff and swelled up like a toad; could scarcely move either arms or legs." Mr. Woolley is a heavy-weight, and it took six men to handle him when he first arrived at the springs. His many friends will be glad to know that he has recovered sufficiently to resume the active management of his extensive machine shops.

A new firm has been organized at Frankfort, Ind., for the purpose of manufacturing brick and carrying on a regular contracting business, and will operate under the title of the Frankfort Brick and Construction Company, with the following officers: W. R. Cunningham, President; Dr. N. C. Davis, Vice President; W. H. Morris, Secretary, and Robert Bracken, Treasurer. They have purchased the brickyard of Hedgecock & Ross, and will operate the same.

The plant of the Ohio Brick and Tile Company, at Mansfield, O., was almost totally destroyed by fire April 24. The fire was discovered in the drying sheds by the night watchman soon after it started, but a strong wind was blowing and the flames quickly spread, until the drier, engine room, containing two engines and boilers, machine sheds and stable were burned down. The loss is estimated at \$18,000, with no insurance. It is quite likely the company will rebuild. The plant was owned by Messrs. Rowlan, Mukley and Carmichael, of Mansfield.

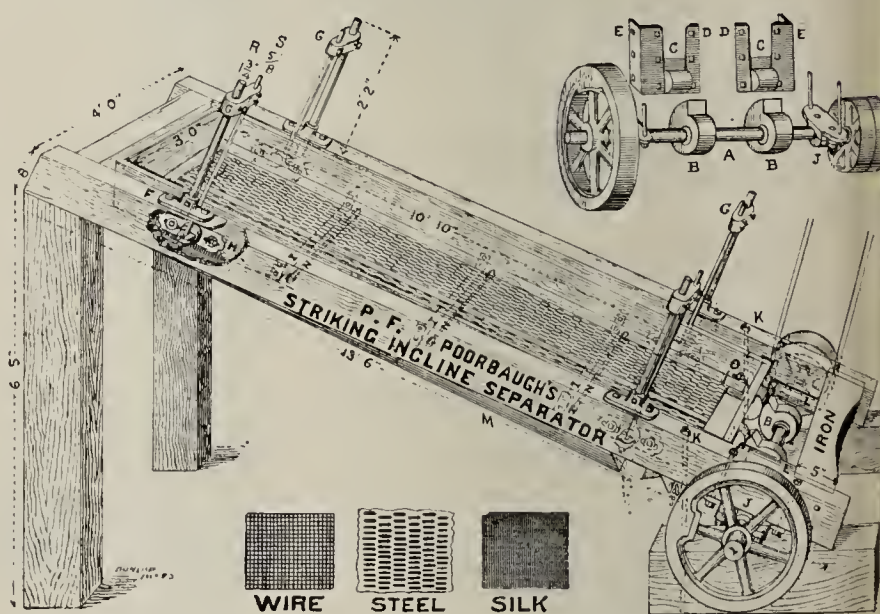
We are in receipt of a circular letter from J. W. Hornsey, late of the F. D. Cumber & Son Co., Cleveland, stating that he has leased for a term of years the plant of the Collinwood (Ohio) Brick & Terra Cotta Co., and will make a full line of pressed, hollow, sewer and common building brick. He will make a specialty of "high grade impervious brick," and expects to furnish the builders of that section a superior grade of brick. Mr. Hornsey is a very clever and capable gentleman, and hosts of friends will wish him the best of success in his new enterprise.

A NEW YORK OFFICE.

The American Clayworking Machinery Company, of Bucyrus and Willoughby, O., have opened a New York office in Room 103, 39 and 41 Cortlandt street, New York, where they will be pleased to have all clayworkers make their headquarters while in New York. The office will be in charge of R. C. Penfield, who will be pleased to attend to all wants of callers, whether they are probable customers or not. The largely increasing Eastern trade of the company made it necessary to open a New York office, and the Eastern customers find it a convenience when in need of anything in the clayworking line.

STRIKING INCLINE SCREEN,

For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.



These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale. Manufactured by the

The Pittsburg Mineral Screen Co.,

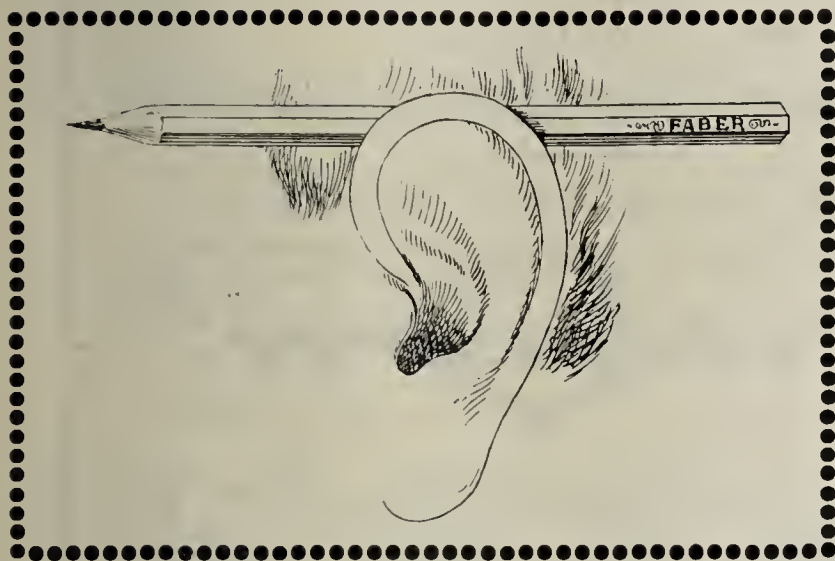
Write for Prices.

PITTSBURG, PA.

Lend Us Your Ear

For a few moments and we will tell you something. This is confidential.

We are selling Brickyard Supplies for a few weeks at considerable less than manufacturer's prices. We do this just to get acquainted with you, and with an eye to future business.



Brick Moulds. All sizes, best cherry, iron bound, durable.

Ready Made Cutting Wires. To fit any brick or tile table—looped and soldered.

Bundle Wire. In 1-lb. packages. Best imported piano wire.

Brick Barrows. Tight or open bottom, one or two wheels.

Wheel Barrows. Sand Barrows, Mud Barrows, Steel Tray Barrows.

Brick Trucks. All kinds.

Tile Trucks, Wheel and Drag Scraper.

Plows, Cars, Carts, Shafting, Pulleys, Belts, etc.

Soft Clay, Stiff Clay, Dry Press Machinery, and all Brickyard appliances.

Write for prices. It would not do for us to publish them.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.



Read What

H. C. Carroll & Sons, of Philadelphia, have to say about the Cummer Direct Heat Dryer which replaced a steam dryer.

OFFICE, 60TH AND HAVERFORD STS.

TELEPHONE 147, W. P.

**H. C. CARROLL & SONS,
Brick Manufacturers,**

Residence, 3831 Lancaster Avenue.

3 YARDS: { 57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell your troubles to"

The F. D. CUMMER & SON CO., Cleveland, Ohio.

BURNING TILE.

In burning tile don't be in a hurry to close the kiln. A few additional hours of careful firing may be the difference between good and inferior tile. See to it that the tile are well burned before closing up the kiln. After closing, give ample time for the heat to equalize and temper the tile before turning on the air draft. The tile from some clays are made better by closing the kiln tight and keeping it so for twenty-four hours after. We say again, don't be in a hurry to close, open and draw, but take time to secure the best results.

SALT GLAZING TILE.

The first requisite is a clay that will withstand a sufficient heat, then the use of a crowned kiln. The tile are set as usual and treated in every particular as if to burn them without glazing, until the tile are brought up to the requisite heat to insure a good burn; then, on the last fires, throw into each fire a common shovel of salt, passing around the kiln twice and using a shovelful each time for each fire; then quickly close the kiln, bottom and top, and let it stand for a few hours, and the work is done. If the tile are not glazed when taken out it will be because the heat was not sufficient; or, if the tile melt down before they will take a glaze, then it is an established fact that the clay will not take a salt glaze because it will not stand the requisite heat. If drain tile are burned to a vitrified body, are straight, ordinarily smooth, uniform, they are good enough for all practical purposes without glazing. The only claims that can be urged for glazed tile in contrast with unglazed tile equally well burned are the less resistance of the inner surface to the flow of the water, the less wear to the hands in handling them and their better appearance. If the clay will take a salt glaze the expense is a small matter, requiring only about two bushels of salt to an ordinary sized kiln, and a little experience in the process; that is all.

NATIONAL EDUCATIONAL ASSOCIATION CONVENTION. MILWAUKEE, WIS., JULY 6-9—BIG FOUR ROUTE.

The Big Four Route will name special low rates to the teachers and their friends for the annual meeting to be held at Milwaukee. These occasions are always looked forward to as among the most pleasurable trips which can be made during the summer. The superior line of the Big Four Route between Cincinnati, Indianapolis, Dayton, Springfield, Columbus and intermediate points to Chicago will afford the best facilities. Full information concerning this trip will be cheerfully furnished on application to any agent of the Big Four Route.

Mention the **CLAY-WORKER**,

When writing to Advertisers

Mention the **CLAY-WORKER**.

Conveying, Elevating and... Power-Transmitting Machinery.

H. W. CALDWELL & SON CO.

Specialties for Handling
Material of
all Kinds.

GENERAL MACHINISTS,
127, 129, 131, 133 West Washington St.,
CHICAGO.

CALDWELL
Steel Conveyor.

Manufactured exclusively by us at Chicago with latest
Improvements

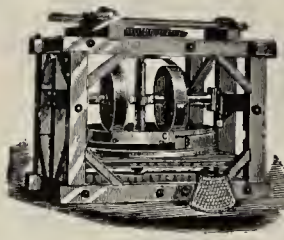
Send for Catalogue.



CALDWELL-AVERY BEAM-
LESS STEEL ELEVATOR
BUCKETS.

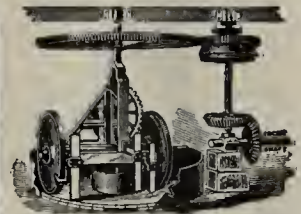
LINK BELTING.
SPROCKET WHEELS
COTTON BELTING.
RUBBER BELTING.
LEATHER BELTING.
BELT CLAMPS.
ELEVATOR BOLTS.
ELEVATOR BUCKETS.
CONCRETE MIXERS.
FRICTION CLUTCHES.
JAW CLUTCHES.
COUPLINGS.
FLEXIBLE SPOUTS.

GEARING (all kinds).
ELEVATOR BOOTS
HANDERS.
PERFORATED METALS.
PILLOW BLOCKS.
IRON PULLEYS.
WOOD PULLEYS.
SHAFTING.
SET COLLARS.
SWIVEL SPOUTS.
TAKE-UP BOXES.
TURN HEAD SPOUTS.
WIRE CLOTH.



Dry Pan.

THE
TURNER,



Clay Mill—Harp Pattern.

VAUGHN & TAYLOR CO.
MANUFACTURERS & EXPORTERS OF
CLAY WORKING MACHINERY.
OHIO, U.S.A.

WIRE DRAWING
MACHINERY.
CHAIN MAKING
MACHINERY.



"CUYAHOGA" COMBINATION MILL, NO. 1.

SHODDY AND
RUBBER
WASHING
MACHINERY.

POWER TRANSMITTING MACHINERY.

PULLEYS & GEARING.

CRANES

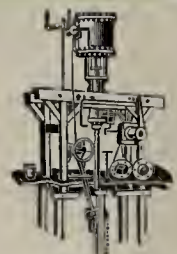
HEAVY CASTINGS
GRAIN CLEANING MACHINERY.
ROPE TRANSMISSION
HOLLOW TUBING MACHINERY.

AND

CONTRACTORS FOR
COMPLETE PLANTS.



Flower Pot Machine.



Vaughn Press—Sewer
Pipe.

BRICK CARS and TRUCKS

Of Any and All Kinds.
Easy Running. Light yet Strong.

Don't fail to get our prices. Catalogue free.

THE ATLAS BOLT & SCREW CO.,
 Cleveland, Ohio.

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,

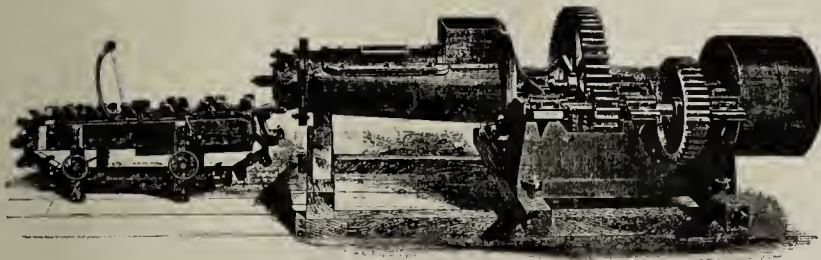
Wellsburg, W. Va.

Nine (9) sold already this Season.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers
... of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequalled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

TENNESSEE CENTENNIAL, NASHVILLE, TENN., MAY 1-NOV. 1—BIG FOUR ROUTE.

The great Southern exposition has created great interest throughout the country, and applications are being made as to the best route to reach this great Southern city. The Big Four has the best line from the East, with through train service to Cincinnati from New York, Boston, Buffalo, Cleveland and Columbus, from Detroit, Toledo and Sandusky to Cincinnati, and from Chicago and Benton Harbor to Cincinnati and Louisville. Direct connections are made with the Q. & C. Route and the L. & N. Railway. Full information will be cheerfully given upon application.

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cent a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE AT SACRIFICE—One C. W. Raymond's No. 1 Perfection hand repress, with extra die; only used ten days. **GEO. WOLFE,** Care Clay-Worker. 51 cm

WANTED—We want to hear from some live town that wants a brickyard. We are brickmakers and have the machinery. Best of reference. Address **J. J.,** 51 cm Care Clay-Worker.

FOR SALE, CHEAP—New latest improved Penfield upright stock brick machine; only used one month; also, 7-foot Fisher wet pan in first-class condition. Address **ROBINSON BRICK AND TILE CO.,** 51 d Care Clay-Worker.

FOR SALE—30-horse-power Atlas engine and boiler, with pump and heater; one extra heavy Quaker (steam power) brick machine and Fletcher & Thomas pug mill. Cheap. All in good condition. For full particulars address **JAS. W. HENSLEY,** 51 c Indianapolis, Ind.

FOR SALE OR RENT—A stoneware plant at Sioux City, Ia. Clay convenient and of excellent quality. Good prices. Market practically unlimited. Terms liberal. Address **SIoux CITY BRICK AND TILE WORKS,** 51 c Sioux City, Ia.

FOR SALE—One 4-mold Boyd brick press, one 4-mold Eureka dry press brick machine, both in first-rate order; one straight line engine, 14x14, in excellent condition; one 8-foot Sturtevant blower; eight 7-foot drying fans; five second-hand horizontal boilers, 50 to 60 H. P., 5 and 6-foot diameters; one Raymond repress, small size, for hand work; 100 iron bedsteads; one No. 2 Worrell drier; one disintegrator, suitable for clay or tile manufacturers; 3,000 seggars, suitable for china or tile work. The above are in good order (excepting the boilers), and will be sold at a bargain. Address **C. SIEDLER, President,** 6th Floor Presbyterian Bldg., 23 dm No. 156 Fifth Ave., New York.

WANTED—An agency for Chicago and vicinity for a good line of fire brick and fire clay suitable for railroad locomotive blocks, foundries and other purposes. Will buy outright or sell on commission. Can give best of references. **DENTER MFG. AND SUPPLY CO.,** WM. GEO. CROSBY, Manager, 51 cm 269 Dearborn St., Chicago.

WANTED—Good second-hand double-deck brick cars. Address, with all particulars, **F. O. BERTRAND**, 323 Baronne Street, New Orleans, La. 51d

FOR SALE—Brick and tile plant complete; machine, two boilers, two engines, good drier, 100 cars, 10,000 pallets, two kilns, good clay, cheap coal, good locality. Will sell cheap. Address **S. DICKERMAN**, Care Clay-Worker. 511pm

FOR SALE OR RENT—Well-equipped brick and tile factory; good trade and location; best quality clay; gas for fuel; reasonable terms; former owner deceased. Address **GOODRICH & BROWN**, 51 cm Pendleton, Ind.

FOR SALE—Well equipped 3-kiln stone and Bristol ware pottery. Established trade. Abundance of finest pottery clay. Will sell at great sacrifice to close up an estate. Address **BEAVER FALLS**, 51c Care Clay-Worker.

WANTED—Wish one or two men with \$20,000 to join me in buying a \$100,000 clay plant for \$30,000, near Chicago. Am a thorough clay man and wish to associate with practical clay men in this deal. Plant is running and making money. Owner has gone to China to build railroad. Address 51d **A. M. E.**, Care Clay-Worker.

FOR SALE—At less than half price—One Penfield stock brick machine and pug mill for sand molded brick, with all pulleys, in good order and ready for making brick. Reason for selling: changed to stiff mud. Address **FACE**, 51f d Care Clay-Worker.

FOR SALE—A soft mud brick plant, consisting of Grand automatic brick machine, pug mill, drum, cable and cars, clay bank pump, Potts mold sander, trucks, barrows, racks and pallets for 150,000 brick, engine, boiler, belting, tank, together with all necessary appliances for complete outfit. Has made only 3,000,000 brick, and will sell all or part very cheap for cash. Address **SALEM**, 51c Care Clay-Worker.

FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, 1/4 screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
All new or little used, and in excellent condition. Address **WALNUT**, 51f d Care Clay-Worker.

BARGAINS.

One No. 12 Brewer machine, 10 molds, with long offbearing belt.
One Brewer conical crusher.
One 12-foot conveyor.
Two Frey-Sheckler Eagle represses, with extra molds.
Used only part of one season; all in good order.
Will be sold, part or whole, low for cash. A rare chance to equip a brickyard of 40,000 daily capacity at small cost.
McCOY BRICK AND TILE CO., 51d Augusta, Ga.

FOR SALE.

1 Penfield No. 10 auger brick machine.
1 Penfield automatic cutter.
1 Penfield board delivery cutter.
1 Penfield pug mill.
1 Penfield power repress.
1 20-horse-power engine.
160 brick cars, Walworth Run Foundry Co.
2 transfer cars, Walworth Run Foundry Co.
1 hand repress.
Want offers for quick sale. Address 51 cm **W. S.**, Care Clay-Worker.

FOR SALE.

SIMPSON DRY PRESSES.

We have two Simpson presses that we will sell for \$1,800 each, f. o. b. cars Cleveland, O. These presses cost our company \$3,500 each, and not over 500,000 brick were made on them, as we changed our plant from a front pressed brick works to a paving brick works. We guarantee these presses to be in perfect working order, and almost as good as new. Address **FRANK B. MANY**, 809 Cuyahoga Bldg., 52 d Cleveland, O.

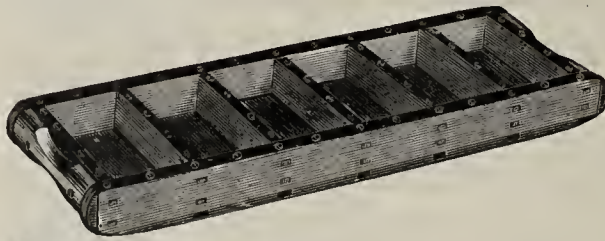
HARDIN, BAILEY & CHURCH.

MANUFACTURERS OF

BRICK MOULDS

Of every kind and description. We make a specialty of Brick moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly. **FREEPORT, IND.**



Don't fail to get our prices.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

F. H. C. MEY, Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

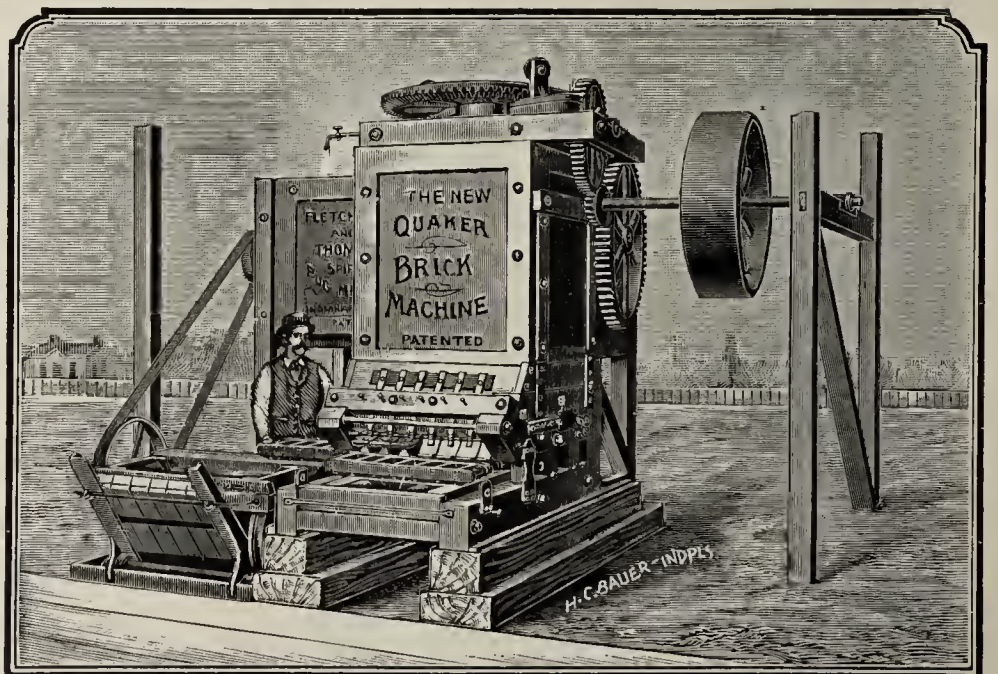
Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

Soft Mud Brick Machinery,

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sanding Machine, capacity 40,000 or more per day. We carry in stock a full line of first-class brickyard supplies at a very reasonable price. Send for Catalogue.



JAMES W. HENSLEY,

General Agent,

Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

G. COLDEWE & CO.,

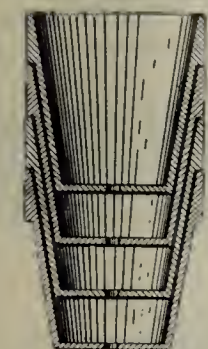
MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and... MACHINE MOULDS

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Make Money WITH THE ONLY SUCCESSFUL Flower Pot Machine (PATENTED.)

No expert workmen required.

Capacity in 10 hours:

6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

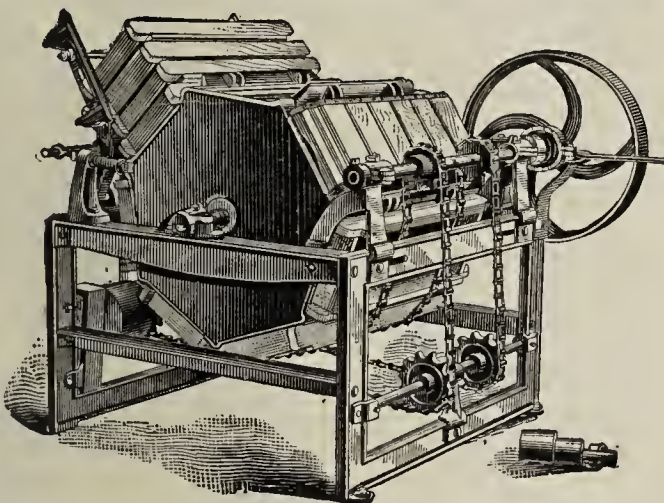
INDIANAPOLIS, IND.



CHAMPION Brick Mould SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and Serviceable.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, and a suit for that purpose has been commenced against Buck and is now pending in the United States Circuit Court for the Northern District of New York.

Only one patent No. 301,087 was involved in that decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit has been commenced on these patents against Buck, and any persons purchasing from him or his agents will be prosecuted for infringement.

4000 TO 5500

(Gallons of Water per hour.)

BY HAND-POWER.

Pumps, Hand-power Pumps.

(LOUD'S PATENT.)

These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries or wherever it is desired to raise a large quantity of water by Hand-power. The pump has large valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



FOR SALE—Simpson Brick Press; good order. Address H., 21 tf Care of Clay-Worker.

FOR SALE—Two complete overgeared 8-foot dry pans, with 48-inch pulley, entirely new. For particulars inquire of SMITH & CAFFREY, Syracuse, N. Y. 34 dm

NO DRY PRESS Brick Plant complete without the Carmichael Clay Steamer. T. W. CARMICHAEL, Inventor and Manufacturer. Wellsburg, W. Va. 6 t f d

WANTED—Situation as superintendent or burner by a man who is practical in every department of manufacturing dry pressed brick; also competent to erect entire plant for same. No. 1 references given. Address OHIO, 41 cm Care of Clay-Worker.

FOR SALE—Plain slide valve horizontal engine, 40-horse-power, 9-foot fly wheel; 1 Crabtree hand repress; 9,000 soft mud foot pallets, 36 inches long; 1 Potts horizontal brick machine; 1 Potts No. 3 disintegrator; 1 Potts sander, and 1 Newall crusher, 26-inch. All in perfect condition. HAMBURG VITRIFIED BRICK CO., 41 d Hamburg, Pa.

FOR SALE—4 second-hand boilers, 40 to 60-horse-power; 1 Chambers machine, 2 pug mills, 12 represses, 18 dump carts, 26 brick trucks, 28 brick wheelbarrows, 20 brick molds. Above goods are all second-hand, and will be sold cheap for cash. Inquire CHICAGO HYDRAULIC-PRESS BRICK CO., Room 301 Chamber of Commerce Building, 15 c Chicago.

FOR SALE—One 4-mold Boyd brick press, one 4-mold Eureka dry press brick machine, both in first-rate order; one straight line engine, 14x14, in excellent condition; one 8-foot Sturtevant blower; eight 7-foot drying fans; five second-hand horizontal boilers, 50 to 60 H. P., 5 and 6-foot diameters; one Raymond repress, small size, for hand work; 100 iron bedsteads; one No. 2 Worrell drier; one disintegrator, suitable for clay or tile manufacturers; 3,000 seggars, suitable for china or tile work. The above are in good order (excepting the boilers), and will be sold at a bargain. Address C. SIEDLER, President, 23 dm 92 Liberty Street, New York.

FOR SALE.

Large brickyard property, formerly occupied by the Merhof Brick Manufacturing Company, at Little Ferry, Bergen county, N. J.; 18 machines and all necessary improvements and fixtures to start manufacturing. Can be cut up into three large yards if necessary. Capacity, 30,000,000 brick per year. For further particulars inquire of SAMUEL TAYLOR, Hackensack, N. J., or M. E. CLARENDON, 78 Gold St., 3 t f L New York City, N. Y.

REAL BARGAINS IN NEW AND SECOND-HAND MACHINERY.

FOR SALE—A good soft mud brick machine, just as good as new, at the price of an old one; capacity 30,000 to 40,000 a day. Has worked successfully where others failed.

FOR SALE—A second-hand 60-horse-power slide valve engine, rebuilt, and a much better engine than many of the light ones now on the market; good for years of heavy work.

FOR SALE—A small but good tile machine, will make 3 to 8-inch tile or common brick, with 10-horse-power; just the thing for a small factory, and cheap.

FOR SALE—A good, though cheap, second-hand 40-horse-power piston valve engine, in excellent condition; suitable for small tile or brick plant.

MADDEN & CO., Rushville, Ind. 4 T 3t

FAST TIME AND THROUGH SERVICE TO SOUTH BEND.

Commencing June 22, through parlor cars will be operated between Indianapolis and South Bend daily, except Sunday, on Big Four train No. 3, leaving Indianapolis at 5 p. m., making immediate connection with Vandalla line fast train at Colfax, which passes through Frankfort, Logansport, Lake Maxinkuckee and Plymouth, arriving at South Bend at 10:45 p. m. G. E. ROCKWELL, D. P. A., for details.

FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade, including both dry press and auger machines, also continuous kilns using coal and producer gas, and different patterns of down-draft kilns. First-class references. Address

SUPERINTENDENT,
Care Clay-Worker.

ELKS' REUNION, MINNEAPOLIS, JULY 6-10—BIG FOUR ROUTE.

For this meeting the Big Four Route will name special low rates to accommodate all members of this great benevolent society and their friends. The superiority of this route between Cincinnati, Louisville, Indianapolis and surrounding territory and to Chicago is conceded by all.

Y. P. S. C. E. CONVENTION, SAN FRANCISCO, JULY 7-12—BIG FOUR ROUTE.

On occasion of this great meeting the Big Four Route will name special low rates from all points on its system via Chicago, St. Louis or Peoria. The Big Four runs through trains from New York, Boston, Buffalo, Cleveland, Columbus, Cincinnati, Indianapolis to St. Louis and Peoria, and from Cincinnati and Louisville to Chicago. Full information can be obtained on application to the nearest agent.

The Keystone Brick Yard Supply Co.,

MANUFACTURERS OF

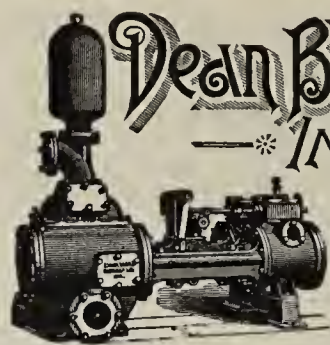
Trucks, Barrows and Brick Moulds, Etc.

We make a specialty of machine moulds and will guarantee all goods to be made as ordered and finished in the best manner. All orders will receive prompt shipment.

Common Brick Moulds 5 or 6 Brick..... \$1.75
Iron Lined " " " " " "..... 2.10

Write for prices on Barrows and Trucks, etc.

THE
Keystone Brick Yard Supply Co.,
Lancaster, Penn.



Dean Bros. Steam Pump Works,

—* INDIANAPOLIS, IND. *—

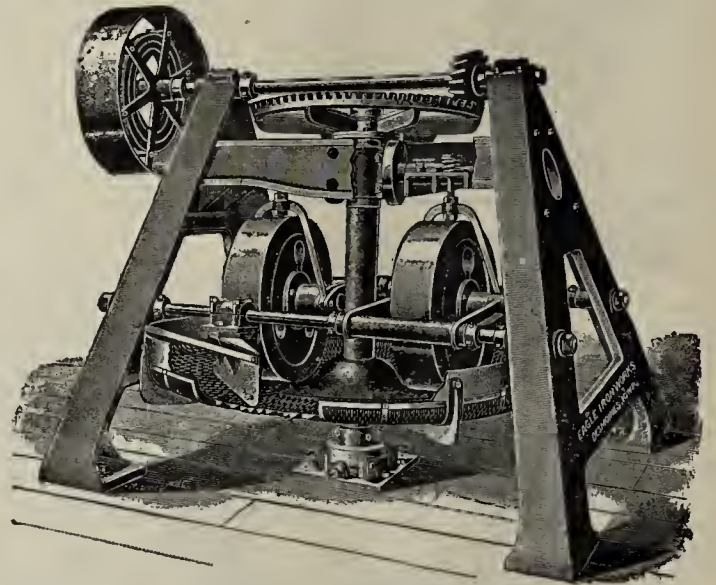
SINGLE & DUPLEX PUMPS.
HORIZONTAL AND VERTICAL PUMPS.
Best Design & Workmanship.
PRICES REDUCED Send for CATALOGUE.

OUR NEW 9 Ft. IRON FRAME DRY PAN

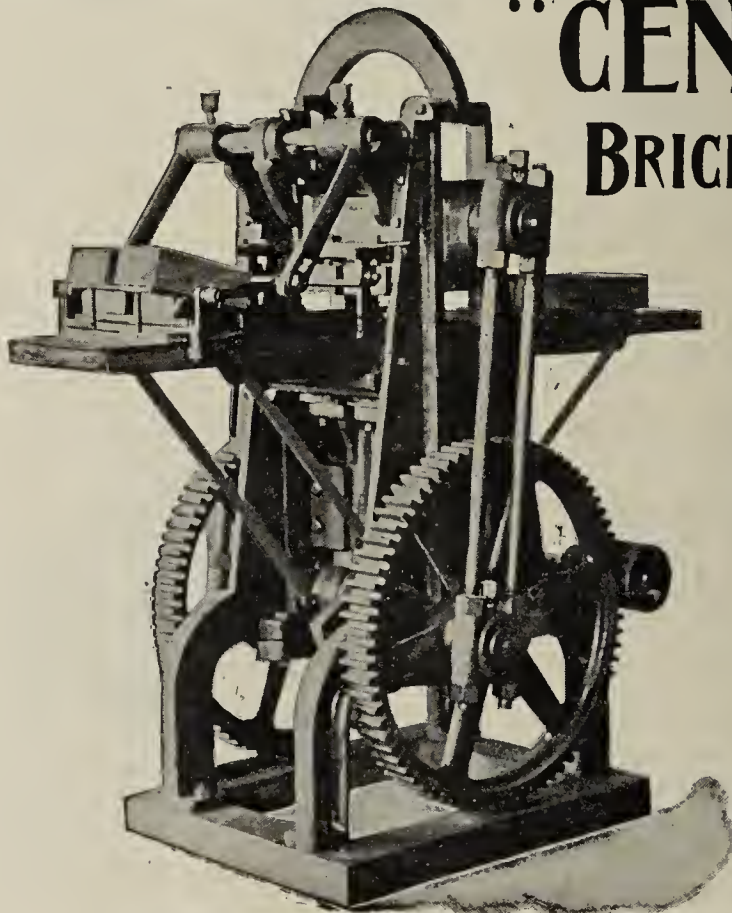
SEND for catalogue and read up on our patented features of this machine. Our motto in its construction and design is

**"NOT HOW CHEAP.
BUT HOW GOOD."**

EAGLE IRON WORKS, Des Moines, Ia.



"CENTRAL" BRICK REPRESS.



This cut shows our double die machine, which is acknowledged to be the simplest and best repress on the market.

It is no experiment, having been in use over two years with best results. Will do same work as others of twice the size and cost.

For particulars address

**Central
Machine
Works,**

236 Abbey Street,
Cleveland, Ohio.

We furnish all supplies and repairs for any make of the "SWORD" Brick machine.

FIRE

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

GEORGE A. MOSHER,
President.

JAMES A. BUCK,
Vice-Prest. and Gen. Man.

LE ROY VERMILYEA,
Secretary and Treasurer.

The Buck Machine Company,

SOLE MANUFACTURERS OF

Champion Brick Mold Sanding Machines, COHOES, N. Y.

The above Company was duly incorporated on the 8th day of March, 1897, under the laws of the State of New York, with a capital of \$60,000, which has been fully paid in.

This company has acquired by purchase all the interests of J. A. Buck and others in the business of manufacturing Champion Brick Mold Sanding Machines heretofore conducted by him, together with all patents covering said machines.

Of these patents, No. 301,087 is the foundation patent on the feed-rack applied to a cylinder machine. Buck's title to this patent was fully sustained by the decision of the United States Circuit Court of Appeals filed December 8, 1896, which decision was affirmed January 25, 1897, and a motion for a rehearing of the case denied. From this decision there is no appeal, and the title to this patent cannot be disturbed.

Patent No. 499,206 was sustained by Judge Coxe of the United States Circuit Court in a decision filed February 6, 1897, wherein he also sustained Buck's title to said patent. This patent covers the yielding form of feed rack as used in the later Champion Sanders. On February 15, 1897, a decree of the Court was entered granting and injunction against the use of infringing machines.

A copy of these decisions will be sent by mail upon request.

Claims against users of infringing machines will be actively prosecuted.

This Company is now prepared to promptly furnish the latest and most approved style of Champion brick mold sanding machines.

These machines are guaranteed in every respect, and purchasers will be fully protected in their use.

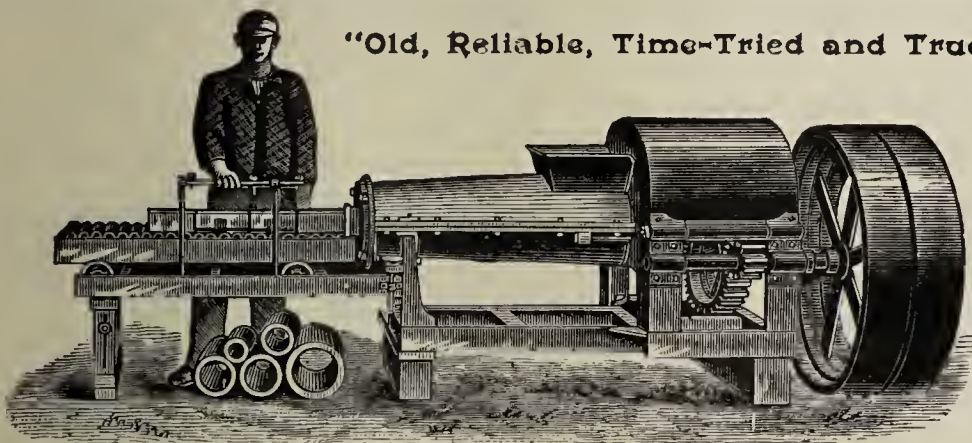
No agents should be recognized except those presenting credentials from this Company.

All communications, orders and payments should be made direct to

THE BUCK MACHINE COMPANY, Cohoes, N. Y.

KELLS & SON'S IMPROVED BRICK AND ... TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the backs and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address—

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON, PARKHILL, ONTARIO,

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the NEW QUAKER BRICK MACHINE.

THE IMPROVED

Interlocking Brick, For Hollow Walls and Ventilating.

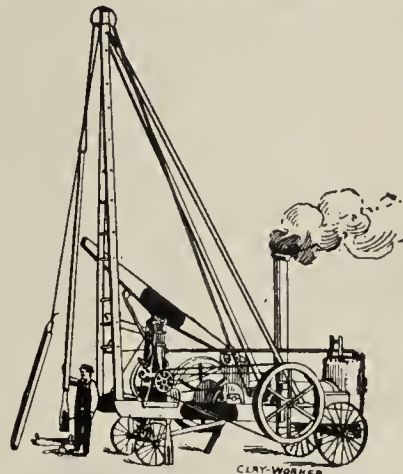
Send for pamphlet.

G. S. BALSLEY, 490 Howard Street, Detroit, Mich.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

**152 State Street,
PERTH AMBOY, N. J.**

Steubenville Foundry & Machine Works,

Established in 1820.

—Manufacturers of—

STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,

Making From 2 to 30-Inch
Pipe Inclusive.

Pipe, Brick, Tile, Coping,
Fire Proofing, and
Building Block Dies.

Clay Grinding and Tempering
Pans and Pug Mills.



FEED
SCREWS

FOR
MINING
CLAY.



**STEAM
— ENGINES**

— AND —

Every Variety of Iron and Brass Castings
Shafting and Pulleys.

Send for Circulars and Estimates.

**JAS. MEANS & CO.,
Steubenville, Ohio.**

COLORIFIC.

For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of

WESTBROOK & WELLS,
Ogdensburg, N. Y.

ALBANY SLIP CLAY.

We have a large bank of a superior quality of SLIP CLAY. Price very low by barrel or carload. Best of reference as to quality. Address

JOHN H. JACKSON,
Successor to JACKSON BROS.,
ALBANY, N. Y.

N Y State Drain Tile and Pipe Works.
Established 1852.

A. F. TENNILLE'S

Bureau of

News and Legislative Information,

Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.



Solid Train Between
Sandusky and Peoria
—AND—
INDIANAPOLIS and
MICHIGAN CITY,
FT. WAYNE and
CONNEERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger..... 7:00 a. m.
*No. 22 Passenger..... 1:20 p. m.
No. 24 Passenger..... 7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger..... 10:20 a. m.
No. 23 Passenger..... 2:50 p. m.
No. 25 Passenger..... 6:20 p. m.
*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on
A. H. SELLARS, Agent,
Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

LUMBER AND BRICK DRYERS, MOST EXTENSIVE IN USE.

W. A. LEARY,

1103 H Street, N. W.

WASHINGTON, D. C.

Do You Want

CREDIT REPORTS on men who make BRICK, on men who buy BRICK, on men who sell BRICK? Trustworthy service at lowest prices; ordinarily \$1.00 for each report.

RELIABLE LIST of BRICK manufacturers and Supply men, in any State, in any Country? These can be furnished at small cost, usually \$1.00 for any single list.

ADVANCE REPORTS that are advance reports of all contemplated construction work calling for BRICK?

TO KNOW how to sell BRICK to the Government?

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS,

ESTABLISHED NINE YEARS.

Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

"LEVIATHAN."

"Upon Earth There is not His Like."



MAIN BELTING CO., Sept 1896.

55 and 57 Market St., Chicago, Ill.
GENTLEMEN:—Please ship us via freight, 146 feet x 18" 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "Just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige.
Yours very truly,

Manufactured under Special Process.

A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

MAIN BELTING COMPANY,

Sole Manufacturers LEVIATHAN BELTING,

55 and 57 Market St., CHICAGO, ILL.

PHILADELPHIA: 1219 Carpenter Street.

BOSTON: 120 Pearl Street.

Elevators

For handling
CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.

Also Furnish
RUBBER,
LEATHER,
COTTON
BELTING.

JEFFREY

Roller, Steel and Special CHAINS
—FOR—
**ELEVATING
CONVEYING
MACHINERY**
FOR HANDLING MATERIAL OF ALL KINDS.
Power Transmission Machinery.
COAL MINING MACHINERY.
WIRE CABLE
CONVEYORS.
For long and
short distance
conveying.

THE JEFFREY MFG. CO., Columbus, Ohio.
Send for Catalogue. 163 Washington St., NEW YORK.

Conveyors.

Manufacture
SHAFTING,
PULLEYS,
HANGERS,
GEARS,
CLUTCHES,
BUCKETS,
BOOTS,
BOLTS,
Etc. . . .

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years. Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

Standard Dry and Wet Pans

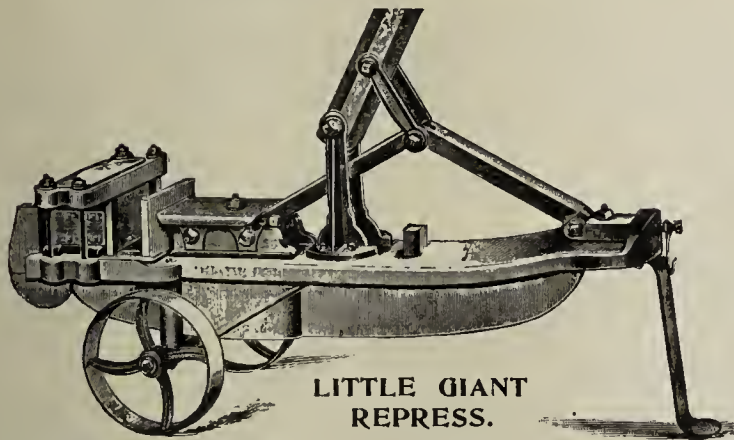
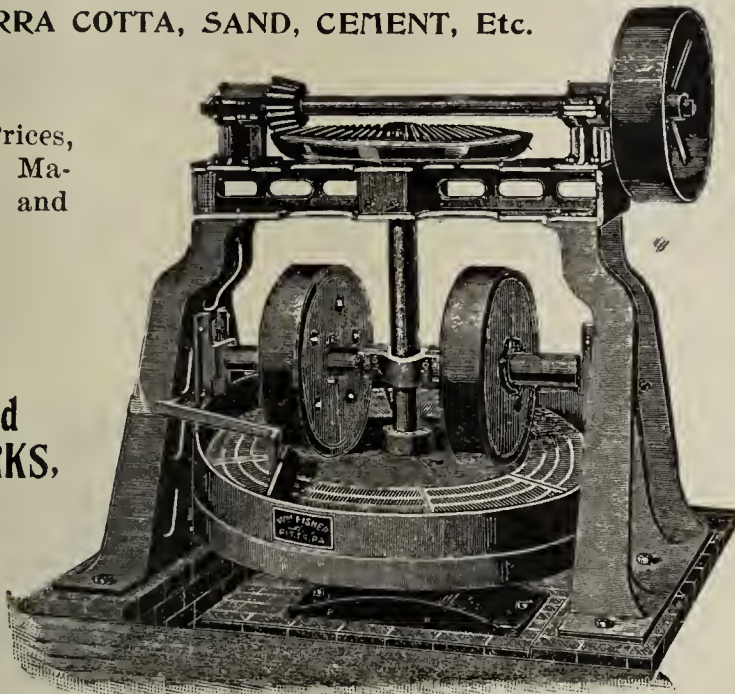
For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

**FISHER ENGINE
FOUNDRY and
MACHINE WORKS,**

Phillips & McLaren,
Proprietors,

24th and Smallman Sts.,
PITTSBURG, PA.



LITTLE GIANT
REPRESS.

ELI Auger Machine,
Capacity 45,000 to
70,000.

ELI Jr. Auger Machine,
Capacity 30,000 to 40,000.

LITTLE ELI Auger
Machine, Capacity
15,000 to 20,000.

No. 1 A, Auger Machine,
Capacity 25,000 to 35,000.

No. 2 B, Auger Machine,
Capacity 12,000 to 20,000.

THE No. 1 A and No. 2 B Machines furnished with Square Hopper in place of Upright Pug Mill if desired.

DISINTEGRATORS, HORIZONTAL CONVEYORS,

GRANULATORS—SINGLE AND DOUBLE SHAFT,

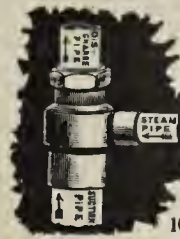
UP-RIGHT PUG-MILLS, WINDING DRUMS,

BRICK TILE AND HOLLOW BLOCK TABLES.

TRUCKS, WHEELBARROWS, ETC.

Manufactured and fully warranted by

Michigan Brick and Tile Machine Co.,
MORENCI, MICH.



VANDUZEN STEAM JET PUMP
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
Always in Order, never Clogs nor
freezes. Every Pump Guaranteed.
10 SIZES.
200 to 12000 Gallons per Hour.
Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, O.

GEO. S. COX'S

**Ready Made
Cutting Wires,**

Always give Satisfaction.

EAST LIVERPOOL, OHIO.

Send for Samples and Prices.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN,
H. W. FULLER, Ass't Gen'l Pass. Agent.
Gen'l Pass. Agent, CINCINNATI, OHIO
WASHINGTON, D. C.

M. V. B. WAGONER'S

SLIP CLAY { For Glazing of Pottery } WORKS

ESTABLISHED 1845.

Clay in stock in any quantity, in barrels and bulk by the carload.

Office, 20 Ten Broeck St., ALBANY, N. Y.

STOP-LOOK LISTEN

THE
POPULAR



IS THE BEST LINE TO

CHICAGO

TIME
REDUCED TO 4 3/4 HOURS.
FOUR DAILY TRAINS

Leave Indianapolis	{ 7:00 a. m., 11:50 a. m. 3:35 p. m., 12:55 night
Arrive Chicago	{ 12:00 noon, 6:00 p. m. 8:20 p. m., 7:20 a. m.
Trains	{ 3:30 a. m., 7:45 a. m.
Arrive Indianapolis	{ 2:35 p. m., 4:37 p. m.

LATEST IMPROVED

VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant

PARLOR CARS AND DINERS

Local Sleeper in Indianapolis Ready at 8:30 p. m.
Leave Chicago, Returning, at 2:45 a. m.
Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: 2 West Washington St.,
Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.

VANDALIA LINE

The Short Line for

ST. LOUIS AND THE WEST.

LEAVE INDIANAPOLIS,	AT. TERRE HAUTE	AR. ST. LOUIS.
* 7:20 am	10:05 am	3:55 pm
* 8:15 am	10:19 am	7:32 pm
* 12:40 noon	2:44 pm	1:44 am
* 7:00 pm	9:04 pm	7:00 am
* 11:20 pm	1:30 am	

*Daily.

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Tickets Offices, 48 West Washington St., 46 Jackson Place and Union Station.

GEO. E. ROCKWELL, Dis. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS

MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns **WANTING INDUSTRIES**

This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

TAKE THE
BIG 4
TO
ST. LOUIS

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 7 1891.

More Than 1,000 Now Stand as
Monuments of Fame to its Inventor

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what they say of it, address,

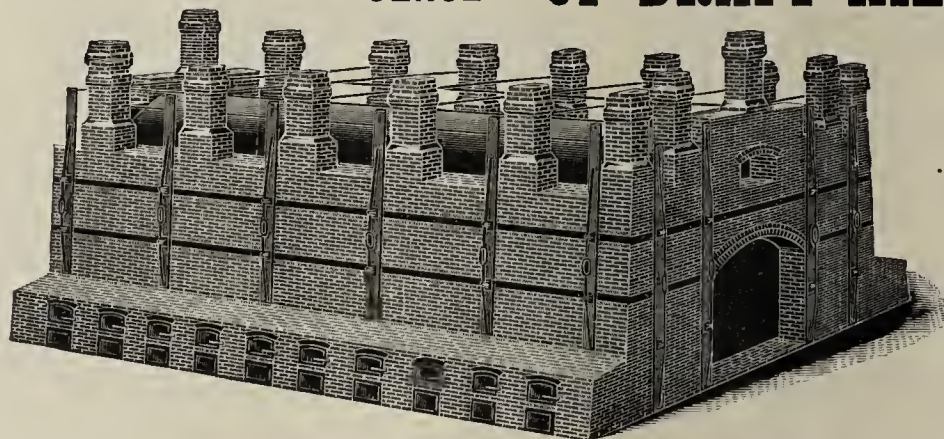
E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
Marietta, Pa.

Chenoa, Ill.



THE THAI SON LATEST IMPROVED COMMON SENSE UP-DRAFT KILN.



Do you make brick? And have you any trouble in burning them? If so, do you want a cheap constructed, simple and durable Kiln? One that will dry any brick without the assistance of Dryer or Fans, and in one-half the time. A Kiln where heat and draft can be changed to any part at will, and burn all hard brick, even and alike throughout, in less time, and with less fuel than any other, no up or down draft Kiln of any kind excepted. This is the Ideal Kiln for Dry Pressed Brick and the best on earth. Sure success with this Kiln. Call and see it at my works or for further information address,

Brick Manufacturer.

A. THAI SON, Laredo, Texas.

THE



HOT BLAST APPARATUS

FOR DRYING BRICK TILE AND TERRA COTTA

American Blower Co
SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

SEND FOR CATALOGUE

THE Best Up-to-Date Brick Dryer.

The PHILLIPS DRYER is THE BEST DRYER because it dries brick Quickly, Safely and Cheaply. By this system there is really no cost for fuel for it saves more fuel than it uses. This may sound queer but it's A PROVEN FACT.

SOMERSET, MASS., August 26, 1893.

S. G. Phillips, Esq., Rahway, N. J.

DEAR SIR—Replying to your inquiry regarding Dryer. We are pleased to say the dryer has now been running five weeks, and so far has given the best of satisfaction, drying our pressed brick for enameling in 10 hours, size of brick (9" x 4 1/2" x 3") without warping or checking. A vacuum gauge to the exhaust, that heats the dryer, shows our variable cut-off engine to be made condensing, and it is safe and not over-estimated in any point of view to say, the dryer is so far working all right, and costing us no extra power, or firing, as we also do our former work and yet are saving 20 per cent. in our fuel.

We consider the dryer to be doing all if not more than promised, and hope soon to add to our present capacity another two track section.

Yours truly,
SOMERSET & JOHNSONBURG MFG. CO.,
By Warren H. Sandford, Treas.

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,
CHAMBERS BROTHERS CO.,
J. H. Chambers, Gen'l Mgr.

S. G. PHILLIPS.

Agent and Patentee,

161 Grand Street.

Rahway, N. J.

ARCHITECTURE

Architectural & Mechanical Drawing; Marine, Stationary and Locomotive Engineering; Sheet Metal Pattern Cutting; Plumbing; Electricity; Railroad, Municipal, & Bridge Engineering; Surveying and Mapping; Book-Keeping; Shorthand; English Branches; Mining; Metal Prospecting; Machine Design. All who study

GUARANTEED SUCCESS.

Fees Moderate, Advance or Installments.

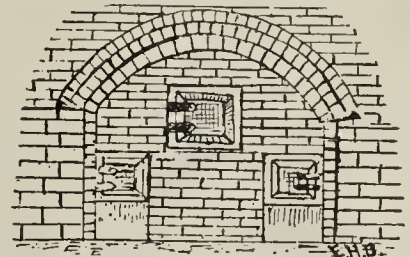
Circular Free; State subject you wish to study.

International Correspondence Schools, Box 958, Scranton, Pa.



Swift's Kiln Furnace,

CAN BE ATTACHED to any kind or style of Up or Down-Draft kiln. Nothing but slack or waste coal used from start to finish of burn. Fires not disturbed but once in 10 hours till watersmoke is off. Guaranteed to



F. E. SWIFT'S PATENT SLACK COAL COKER, GAS GENERATOR AND SMOKE CONSUMER.

watersmoke dry press brick or the tenderest of clays or ware of any kind without damage. These furnaces can be seen in operation at my works at all seasons burning drain tile in winter and brick in Summer. It will pay you to investigate—I can save you good money.

For further particulars, address

F. E. SWIFT,
Washington, Iowa.

Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD and JACKSONVILLE, ILLINOIS.

TIME OF TRAINS AT INDIANAPOLIS:

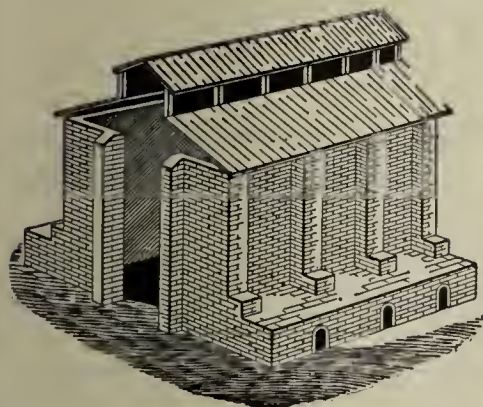
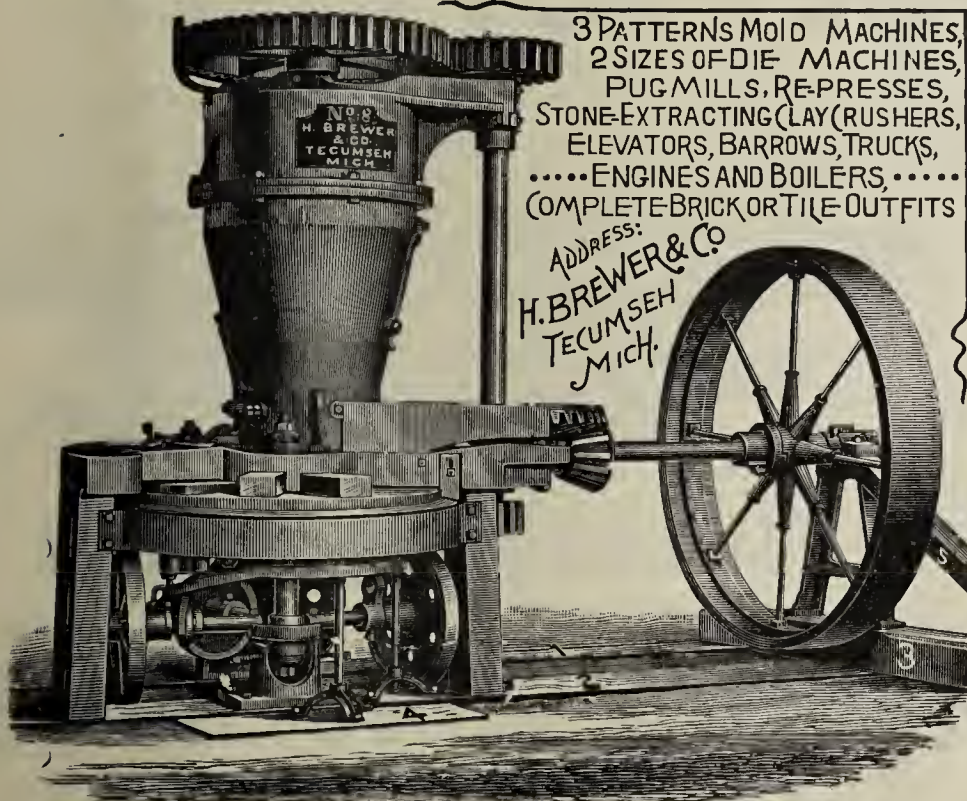
LEAVE.

Mail and Express.....	8.30 a m
Accommodation.....	3.25 p m
Fast Express.....	11.20 p m

ARRIVE.

Fast Express.....	3.30 a m
Accommodation.....	10.40 a m
Mail and Express.....	4.50 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



Up-Draft Kiln.

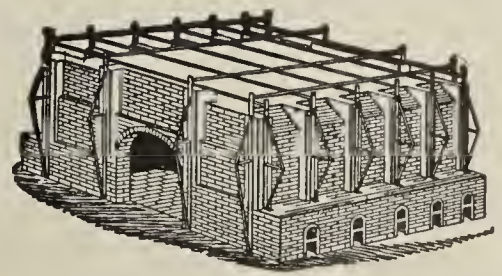
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

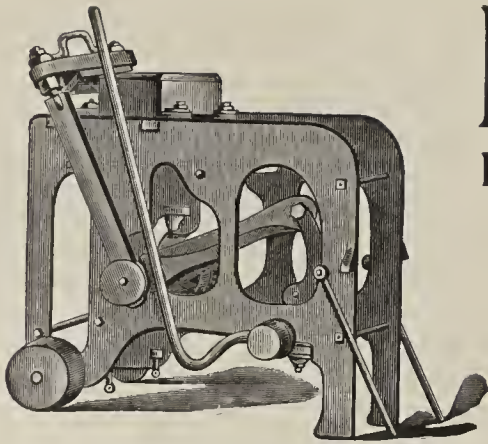
Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET. The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiln.



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

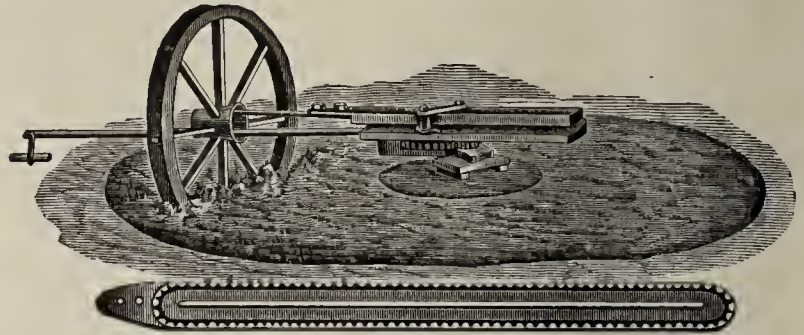
Send for Circular and Price-List.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.



BRICK CARS.

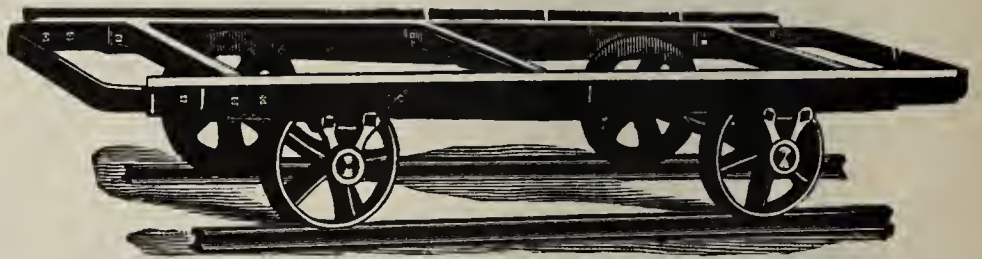
THE BEST. NO EXPERIMENT.

Thirty styles of our cars in use in all parts of the United States and Canada. Nearly 2000 of our cars are in use in Cleveland alone by the following Brickmakers:

F. H. Eggers,
C. G. Barkwell,
Standard Brick Co.,
Peter Cullen,
Collinwood Brick Co.,
Cleveland Brick Co.,
Canadian Copper Co.,
George Gynn,
Warren Farr,
John Cullen.

Write Them,
Then Us.

Catalogue and Price List sent on application.



Style 28.

WALWORTH RUN FOUNDRY CO., Cleveland, O.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

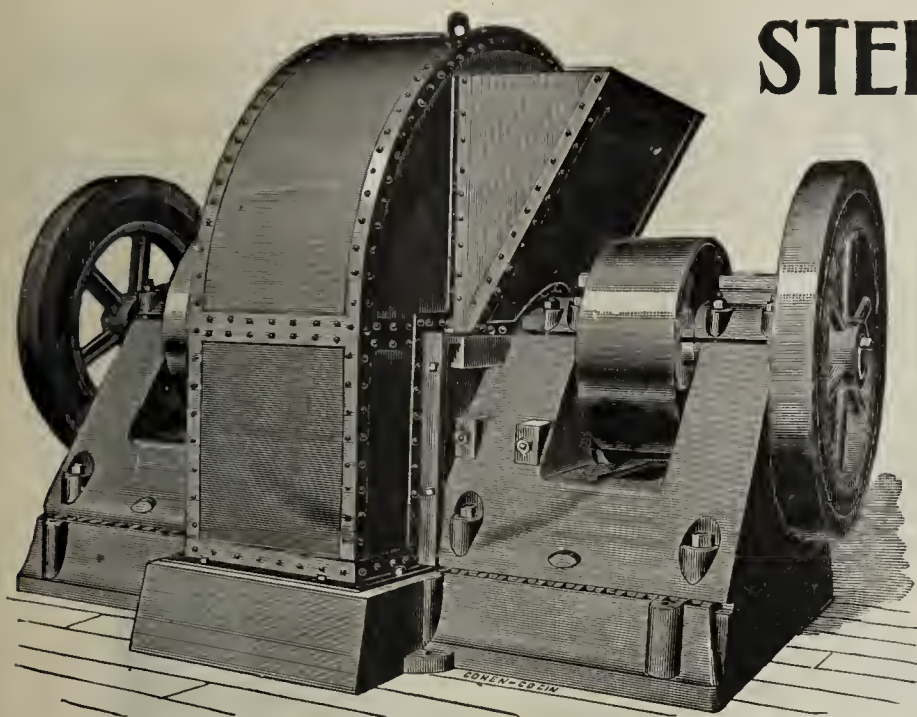
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

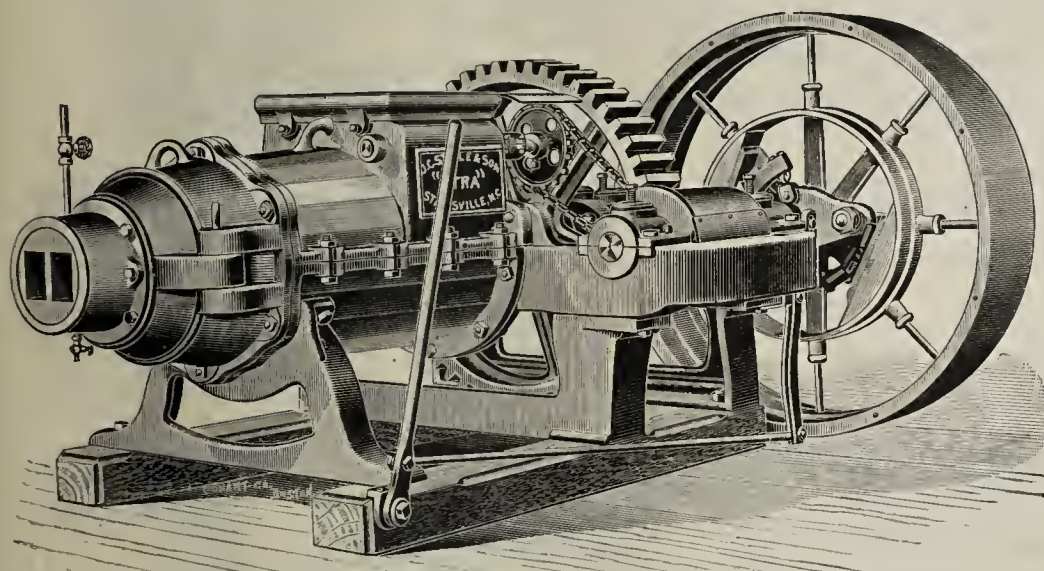
Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

Aurora, Ind.

The New South Brick Machinery



X-tra Machine. Capacity 25,000.

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.

DANVILLE, VA., Sept. 22, 1896.

J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Answering your query as to how we are pleased with the outfit furnished us by you of brickmaking machinery and implements, we would say that it has given us good satisfaction. The brick machine does all that you claimed for it. The trucks are great labor saving implements and the winding drum and cars equally so. In our system we could hardly dispense with either the trucks or cars and drums.

Respectfully,
DON VALLEY BRICK CO.

(This company is using the "X-tra" machine and make 30,000 brick per day.

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

ALSIP'S

LATEST IMPROVED
DOWN and
UP=DRAFT KILN.

IS SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

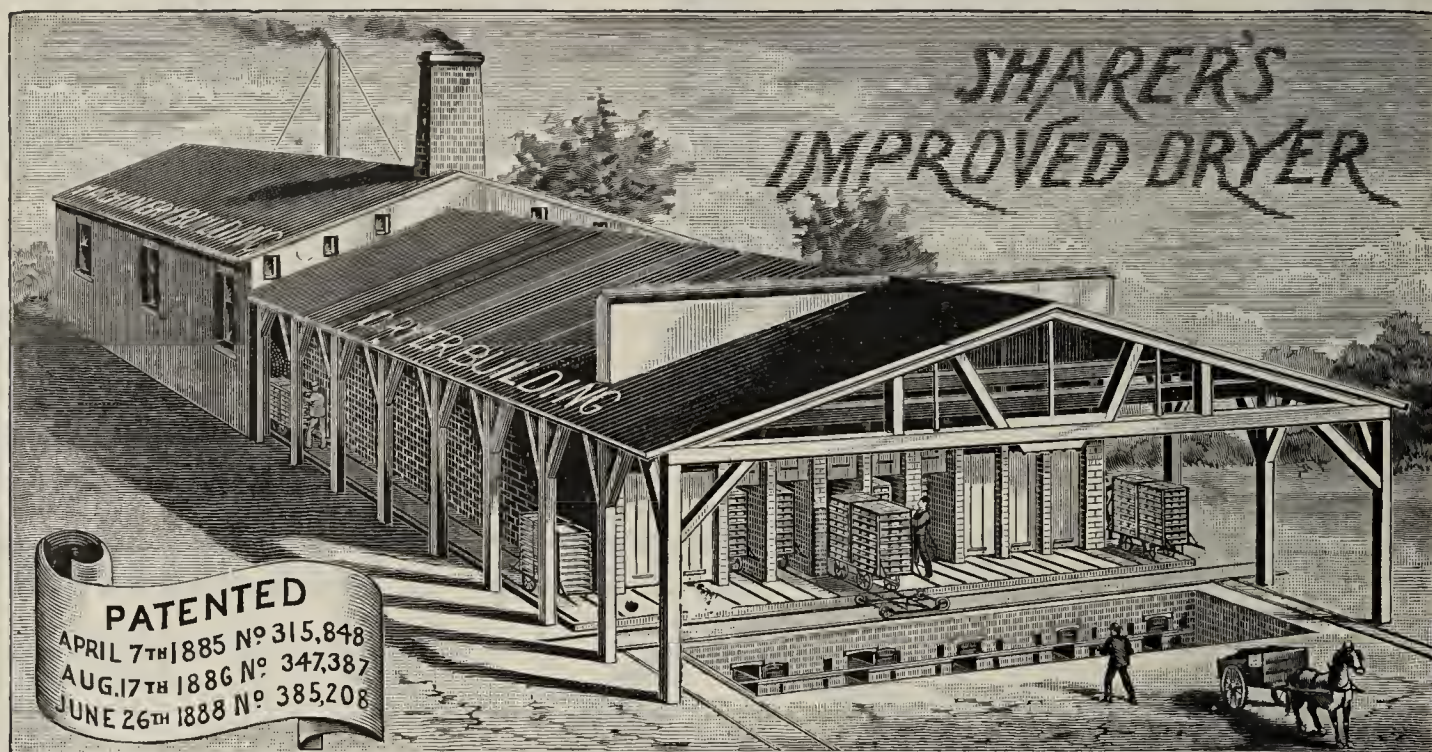
Address, **S. H. ALSIP,**

Days Brick Yard.

BELLEVILLE, ILL.

Geo. W. Sharer,

Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.



COMPLETE Dryer and Kiln outfits, and Complete Plants a specialty. Address

GEO. W. SHARER, 2224 Tioga, St. Philadelphia, Pa.

CONLEY AND WOLFE IMPROVED KILN COMPANY.

TARKIO, Mo.

OFFICERS:

DAVID RANKIN, PRESIDENT, TARKIO, Mo.	JOSEPH CONLEY, VICE-PRESIDENT, MOUND CITY, Mo.
W. F. RANKIN, SEC'Y AND TREAS., TARKIO, Mo.	J. M. WOLFE, GEN'L M'GR, TARKIO, Mo.

PATENTS:

No 477,983, JUNE 28, 1892.
No 477,994, JUNE 28, 1892.
No 487,174, NOV. 29, 1892.
No 491,037, JAN. 31, 1893.
No 491,038, JAN. 31, 1893.

THIS KILN is cheap to construct, simple in operation and permanent in character. It has no crown to fall in and costs nothing for repairs. The dampers in the bottom give complete control of the heat and draft. It burns all brick evenly and thoroughly. It heats the brick gradually and cools the same, producing a tough and thoroughly annealed brick. It requires less than 200 lbs. slack coal per thousand to burn the very best annealed vitrified shale paving brick. It saves labor—one man can fire the largest kiln.

The Slack is converted into Gas and all the Heat Energy in the Coal is Utilized.

IT IS A SMOKE CONSUMER
AND A PROFIT PRODUCER.

✦ **YOU NEED THIS KILN.** ✦

WRITE OUR GENERAL MANAGER
FOR FULL INFORMATION.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

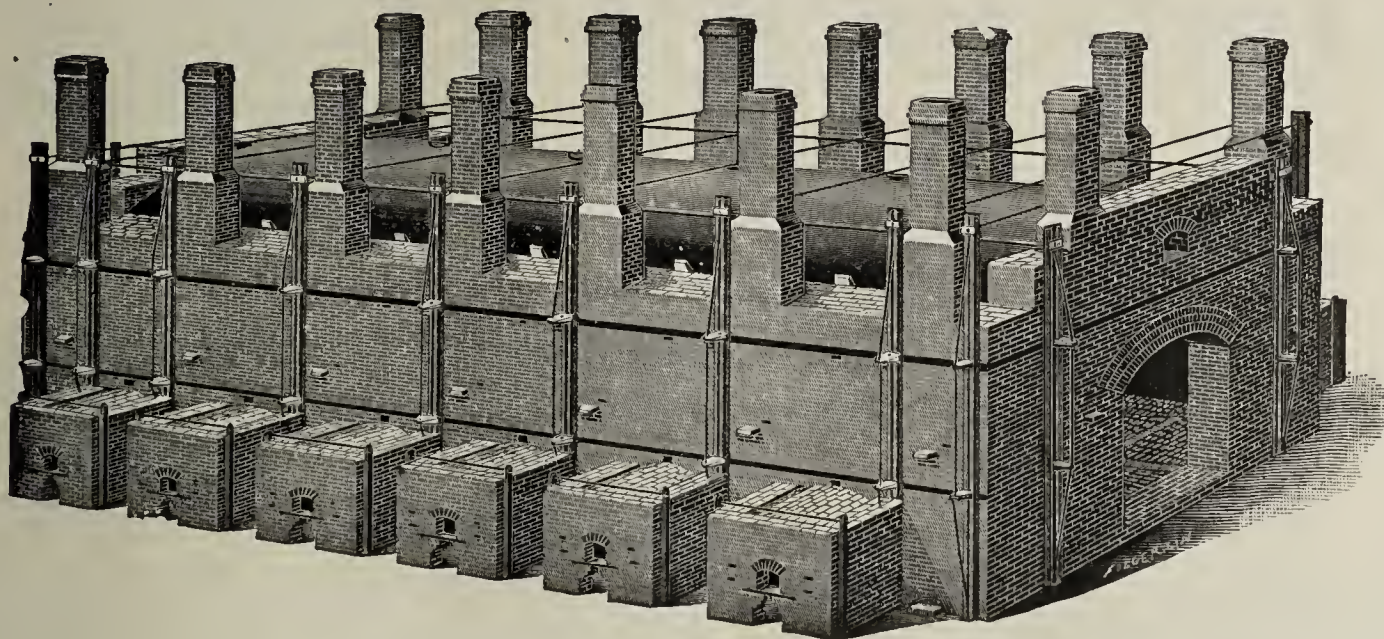
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



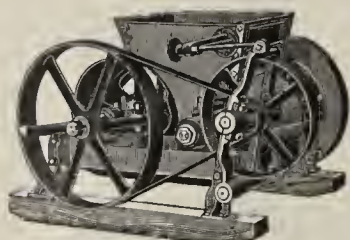
A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

Are Worthless Goods Copied? Or Unpopular Goods Imitated?



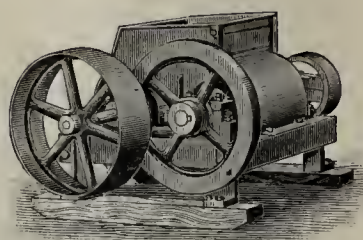
(PATENTED.)

NO

.....

Because
it Isn't
Worth While.

.....



(PATENTED.)

Therefore the extensive counterfeiting of the Potts Disintegrator, is the strongest evidence of it's merit.

Made in any size to suit large or small yards.

It never fails to do all we claim for it. It has entirely superseded the roller crusher. Works in any clay. Never chokes or clogs; either grinds or separates the stone.

BEWARE Of these counterfeits and write us for information and prices. We can save you money. You take no chances.

.....

C. & A. POTTS & CO.,

420-428 West Washington St.,

INDIANAPOLIS, IND.

There's a Whole Lot

Of New Fangled Ideas and Untried Theories,
that you WILL NOT find in

'97

Outing

BICYCLES.

\$100

\$75

\$50

We leave the "theories" for whoever may care to monkey with them. All we tie up to is "CON-
DITION"—proven condition.

If you see it in the Outing's construction you may know its been tested and proven "RIGHT."
Every "proven improvement" known to cycle construction is embodied in their make up.

Send for our Art Catalogue. If there's no agent in your city, you might write us for terms. Our
reply is liable to be interesting.

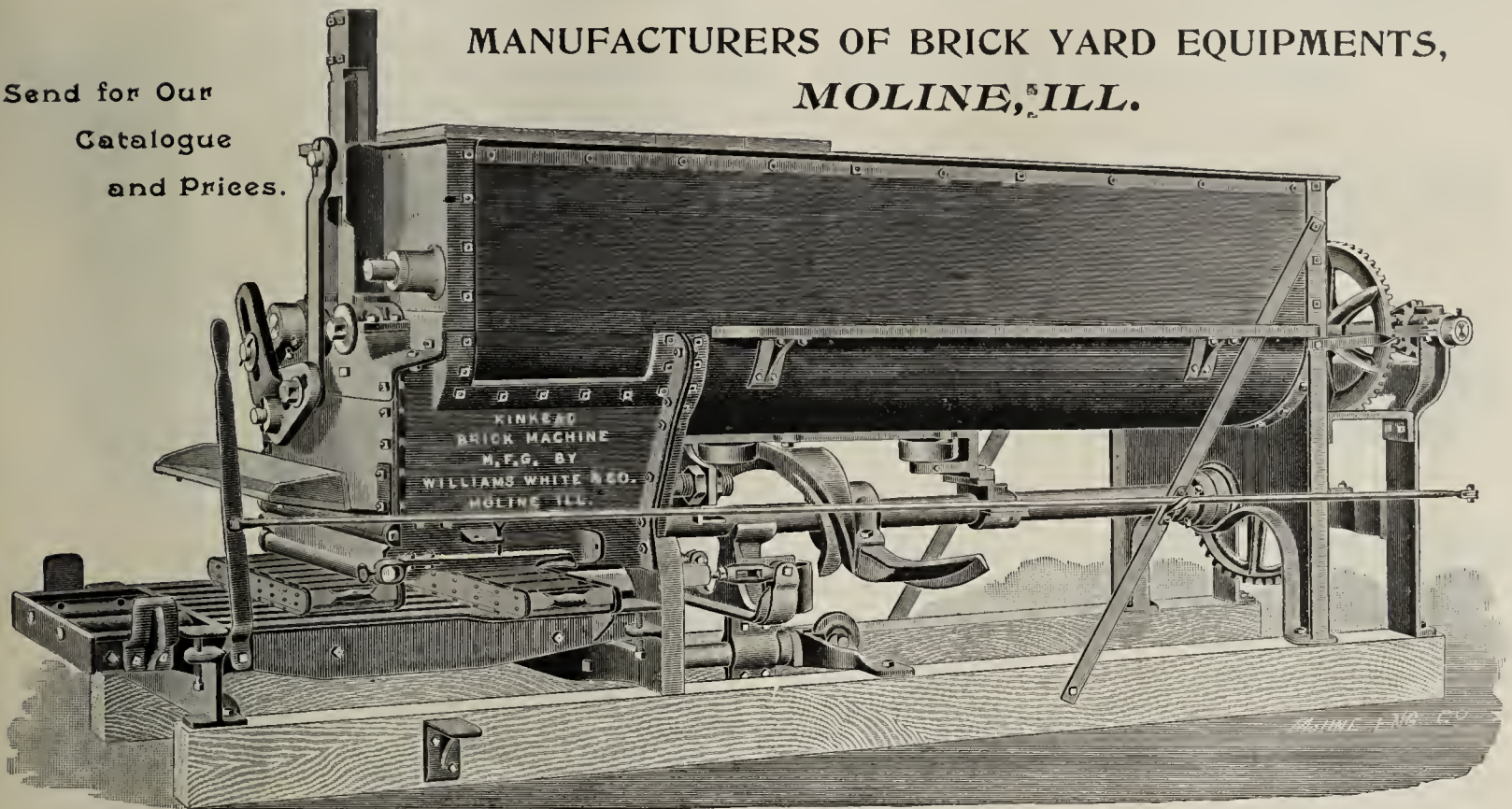
HAY & WILLITS MFG. CO.

76 N. Penn. St.,
INDIANAPOLIS.

WILLIAMS, WHITE & CO.

MANUFACTURERS OF BRICK YARD EQUIPMENTS,
MOLINE, ILL.

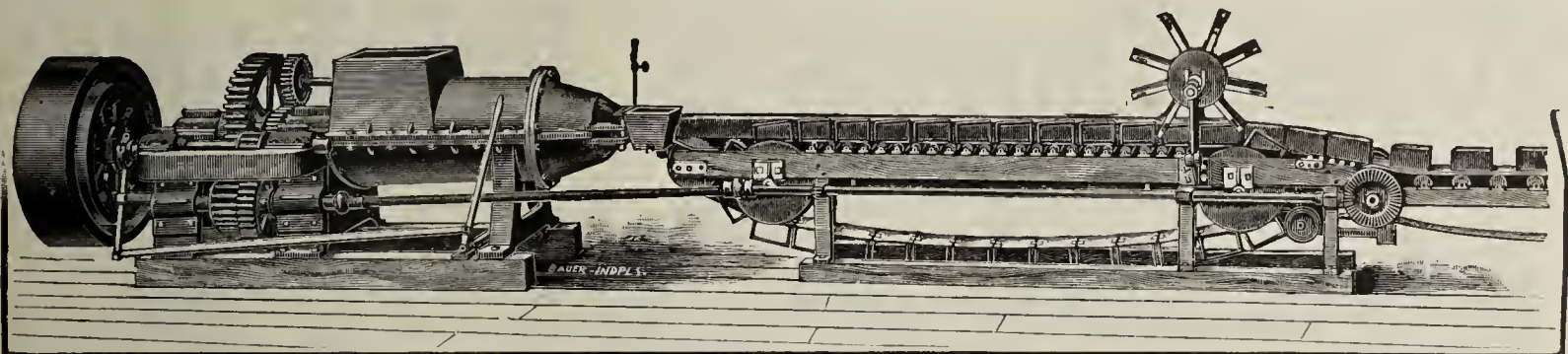
Send for Our
Catalogue
and Prices.



The **KINKEAD MACHINE** takes the clay direct from the bank, preparing it more thoroughly than any pug mill or machine on the market. It fills the mold full and sharp every time. It is simple in construction, easy to take care of, and durable.

We solicit correspondence also on complete outfits for brickyards—molds, trucks, barrows, cars of all kinds, elevators, sanders, disintegrators, etc., etc. Get our Mold circular and prices.

(Mention the CLAY-WORKER.)



LEADER

MANUFACTURING CO

DECATUR ILL.

MANUFACTURERS OF

BRICK MACHINES, BRICK PRESSES,

PUG-MILLS, CRUSHERS

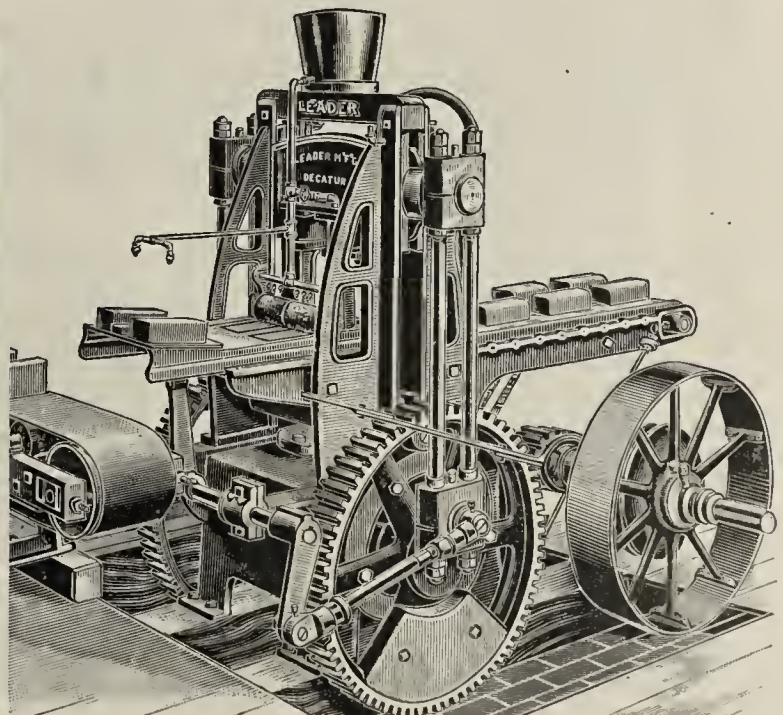
DISINTEGRATORS, AUTOMATIC CUTTERS,

✦ ELEVATORS ✦

AND

COMPLETE OUTFITS.

SEND FOR PRINTED MATTER.

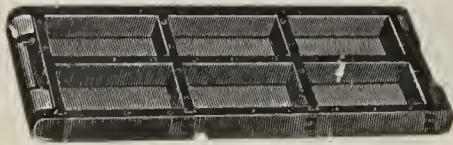


ARNOLD'S

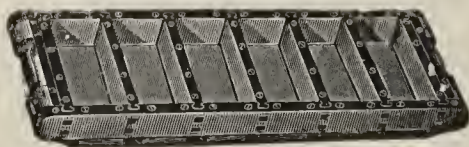
BRICKYARD SUPPLIES,
Are the Standard.



3 Brick Hand Mold.



6 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

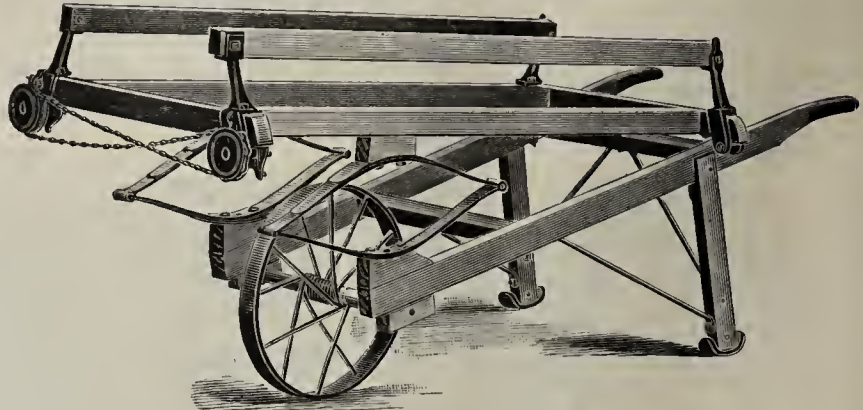
We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

Send for catalogue and price list. Address,
D. J. C. ARNOLD, New London, Ohio.

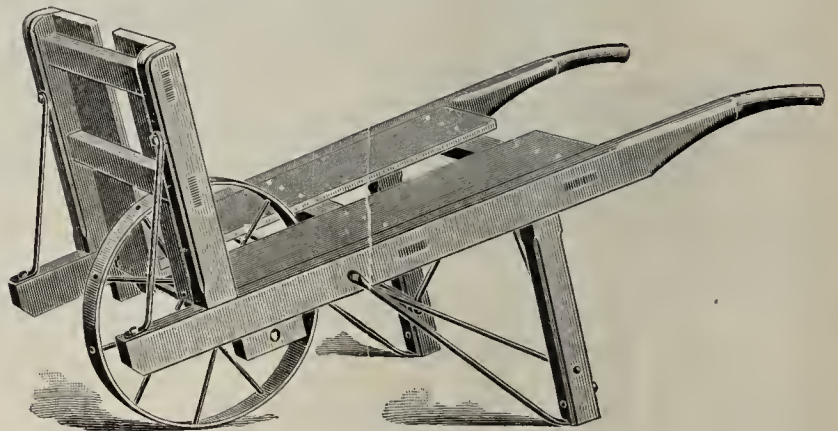
TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market.

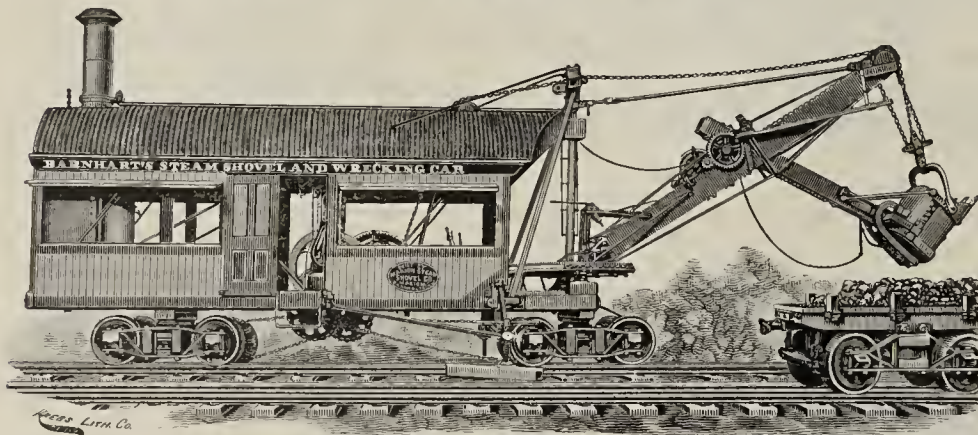
BARROWS, For Various Purposes.

Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind.



No. 4 Brick Barrow.

Steam Shovels for Brickyards.



STYLE A-1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

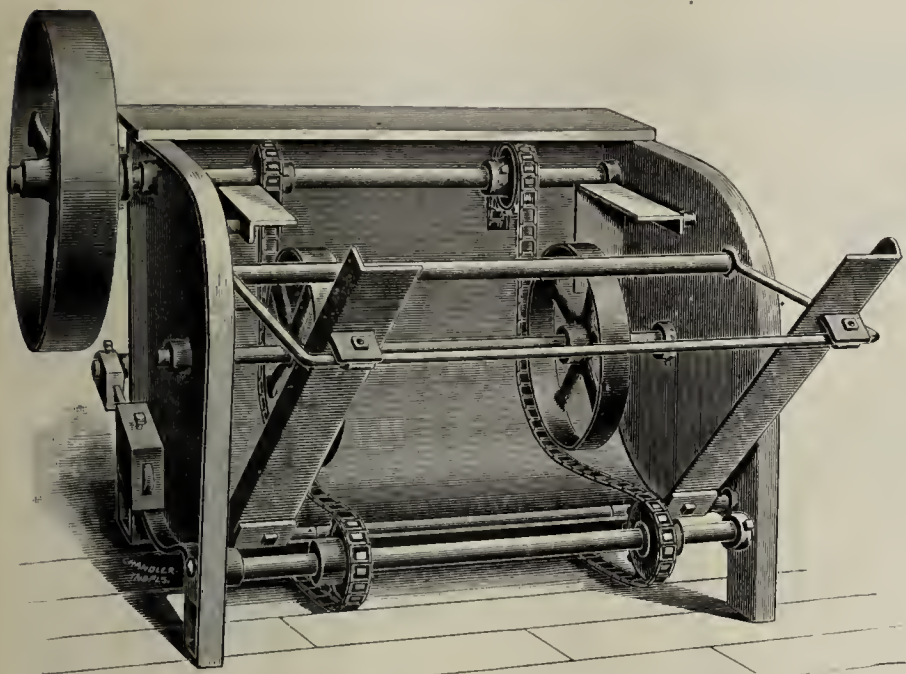
The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.



STYLE C-¾ YD.



(PATENTED.)

The Potts Mould Sander.

MADE EITHER WITH CHAIN
or RUBBER BELT.

....

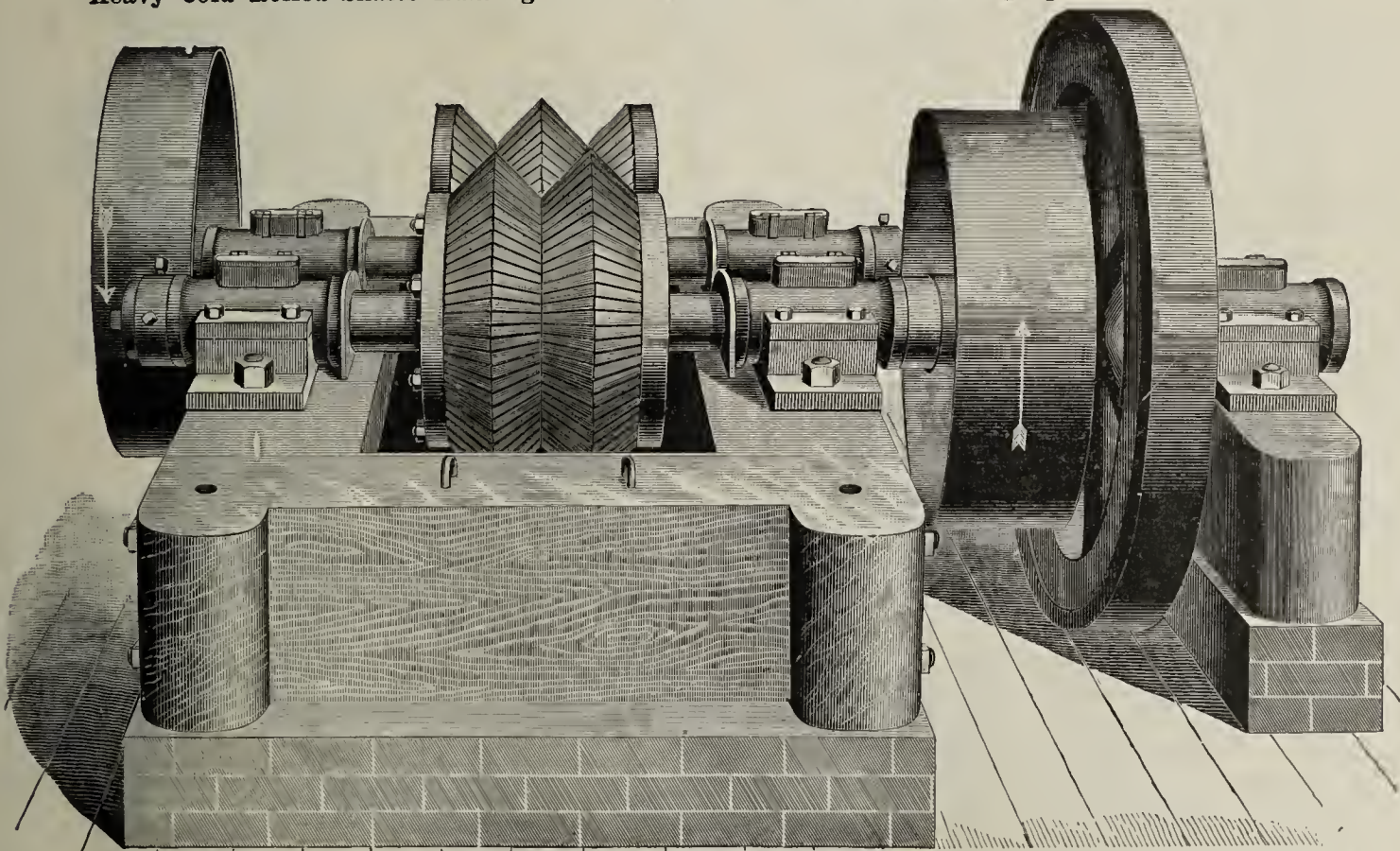
They are simple in construction, strong and durable. Never strike or get drunk. Do the work better than can be done by hand.

Now is your chance. For a short time we will sell this machine for considerably less than **\$100.** **Beware** of infringing machines.

C. & A. POTTS & CO., Indianapolis, Ind.

NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building, New York, U. S. A.
26 Cortland and 21 Dey Streets,

Hard Times

Long drawn out, making retrenchment necessary, have revealed to many the presence of leaks in their business.

To **truly economize** is to stop leaks and avoid—not expenditure—but waste. A machine of doubt is a “thorn in the flesh.”

Give it to your enemy and look through this line.

.....

Four Crisp Points Concerning Our Machinery.

- 1** They are massively built, and the working parts are few, simple and of steel.
- 2** They have rotary movements which invite speed.
- 3** They are equipped with every convenience.
- 4** Exacting users **in your line** say that they are fulfilling the claims made for them and never break.

.....

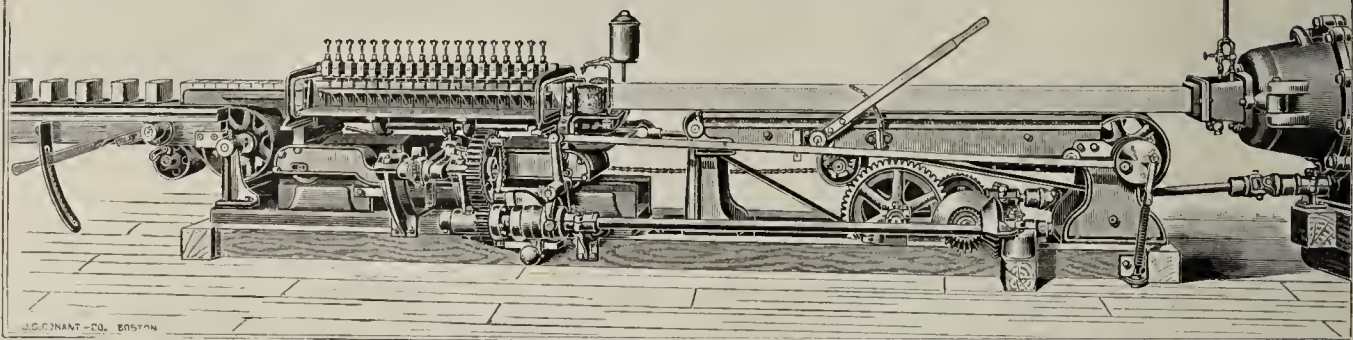
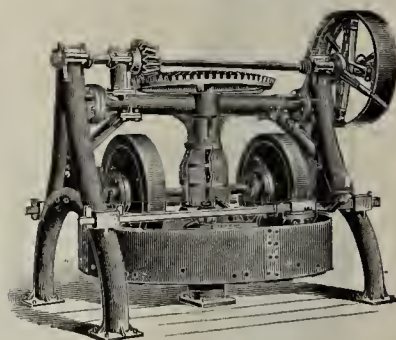
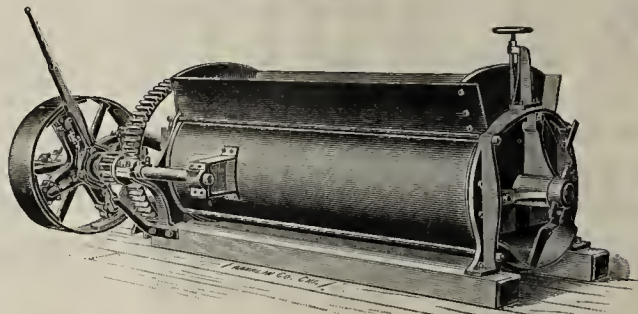
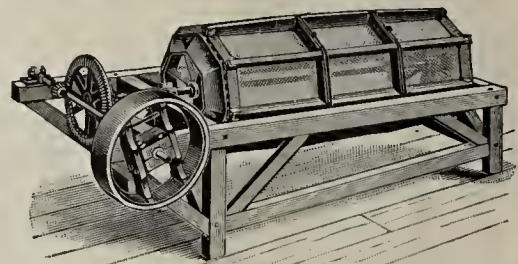
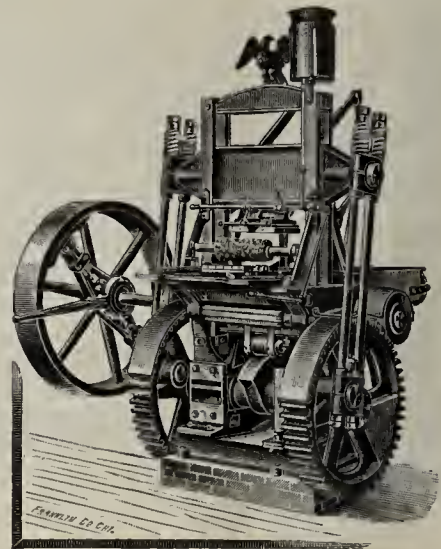
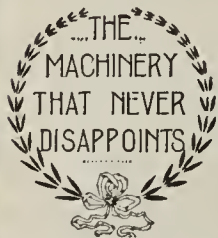
The American Clay-Working Machinery Co.,

Bucyrus, Ohio,
U. S. A.

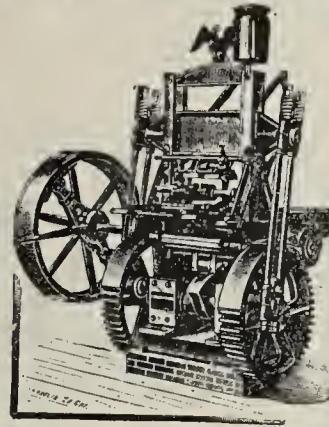
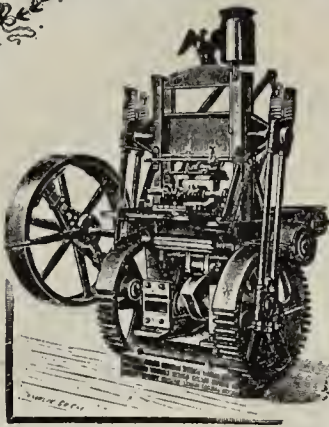
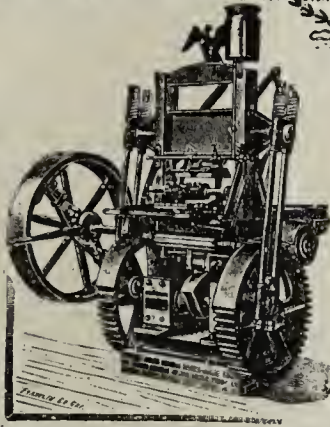
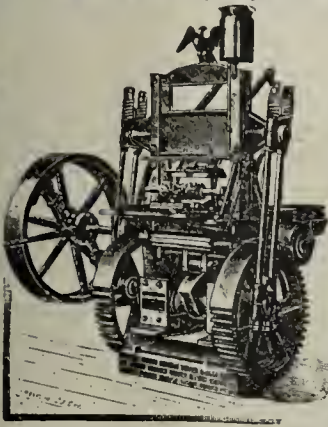
LONG DISTANCE PHONE No. 90.

NEW YORK OFFICE:

39 and 41 Courtland St., Room 103.



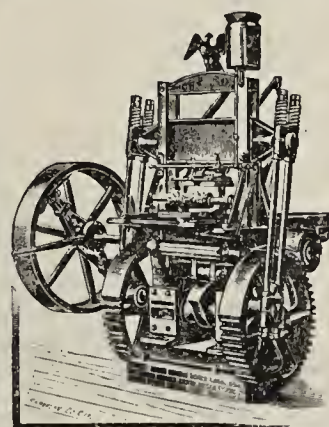
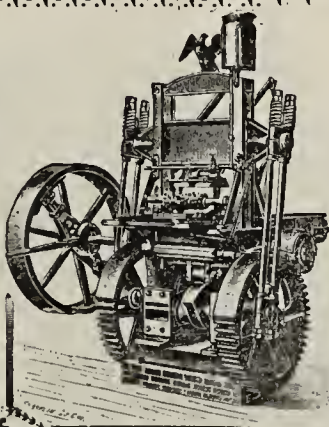
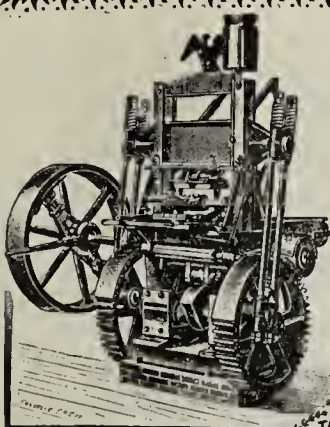
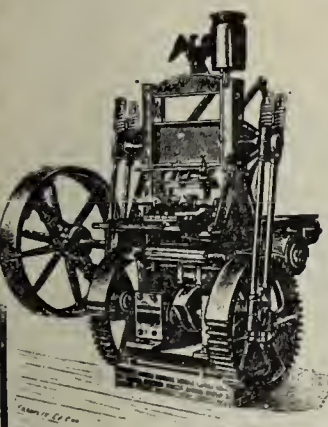
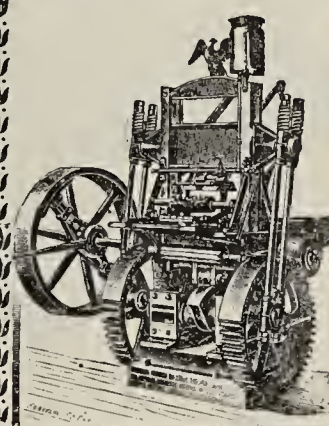
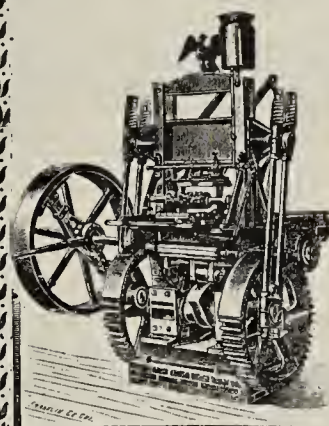
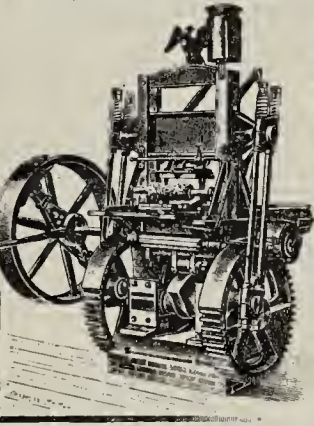
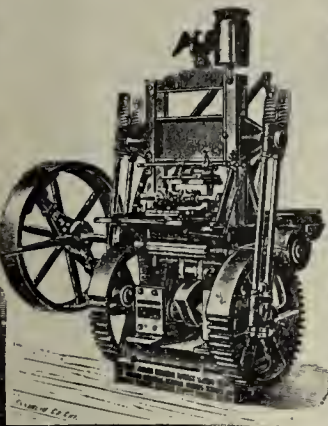
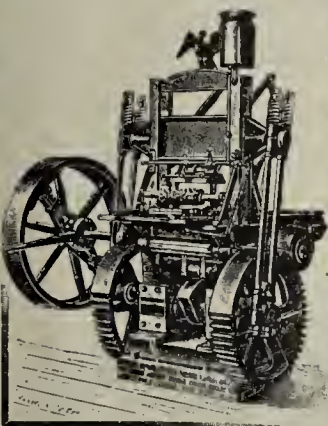
THE
MACHINERY
THAT NEVER
DISAPPOINTS



13 The Unlucky Number! 13

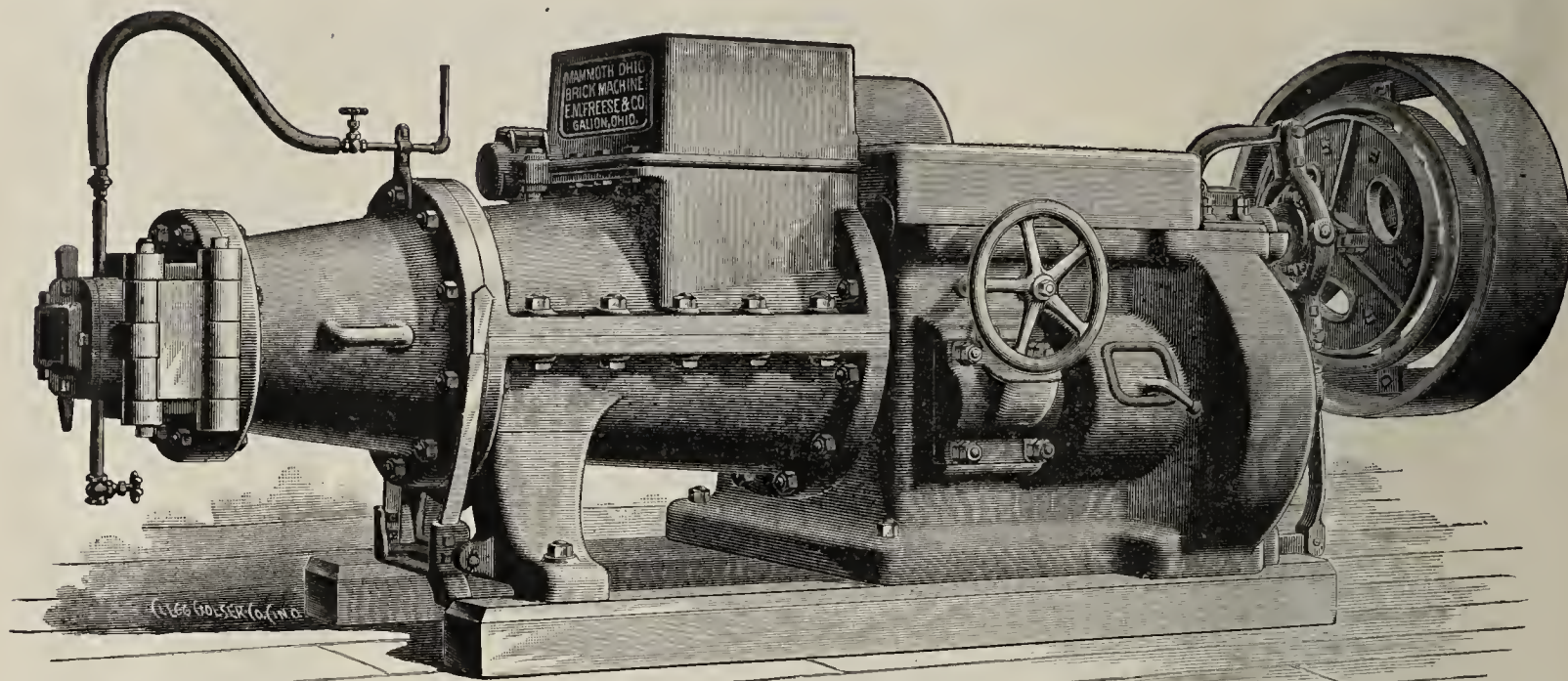
That is the number of Eagle Re-Presses we have in operation in Galesburg, Ill. We don't consider 13 an unlucky number! There were 13 original States. See what a grand Nation has grown from this nucleus of 13. The American Eagle perched proudly upon the American Shield, originally screamed for but 13 stars and bars. To-day there are 45 stars upon our flag. Why, then, should we fear the omen of 13? We are proud that the Eagle of The American Clay-Working Machinery Co. should be perched over 13 of the American's Eagle Re-Presses in Galesburg. There are other manufacturers—several of them—who would be glad of the opportunity to brave the superstitious omen under similar circumstances. It's not a question of luck, but of merit. People who use the Eagle Re-Press are pleased with it. When they enlarge they buy another, and so it goes. In Galesburg the 13 Re-Presses are, every one, giving the best of satisfaction. That's the way with all our machinery. You buy it and are satisfied—not only to-day, but next year and the next decade. Write any one of the following Galesburg people, and see how they like the Eagle Re-Press: Purington Paving Brick Co., 7 Presses. Galesburg Brick & Terra Cotta Co., 3 Presses. Galesburg Paving Brick Co., 2 Presses. Galesburg Vitrified Brick Co., 1 Press. Count the Re-Presses on this page. There ought to be 13 of 'em, and don't forget that we've got that many running at Galesburg, Ill. We've just issued a new description of the EAGLE RE-PRESS. IF YOU WANT IT, WRITE US.

THE AMERICAN CLAY-WORKING MACHINERY CO.,
BUCCYRUS, OHIO.

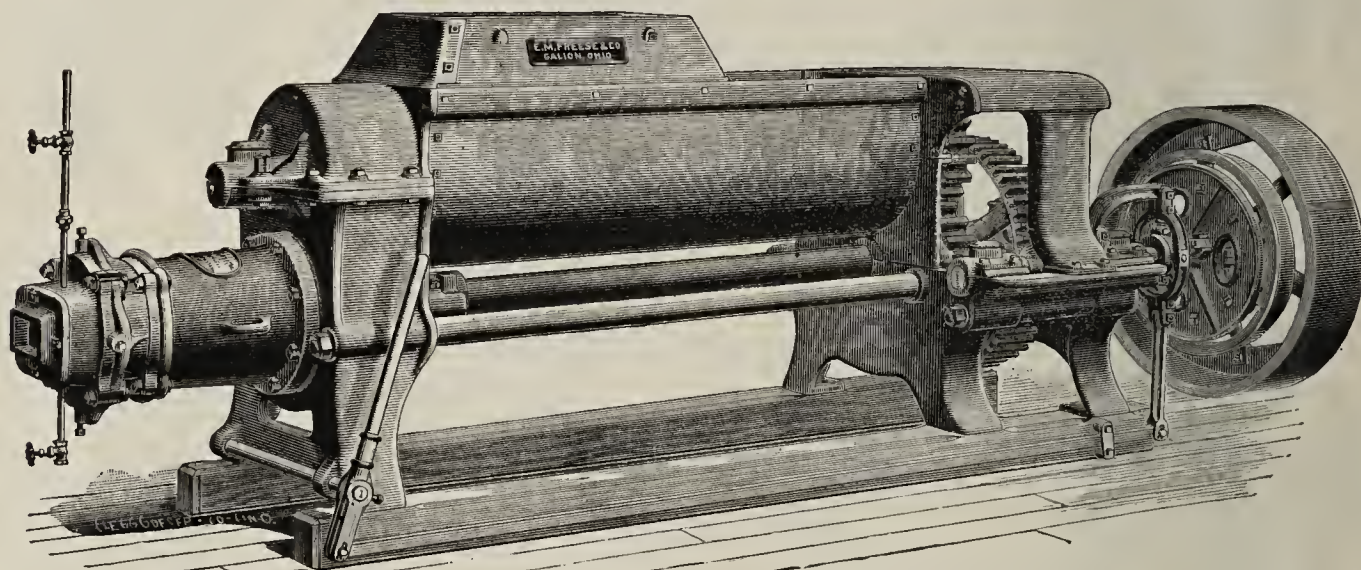


THE
MACHINERY
THAT NEVER
DISAPPOINTS

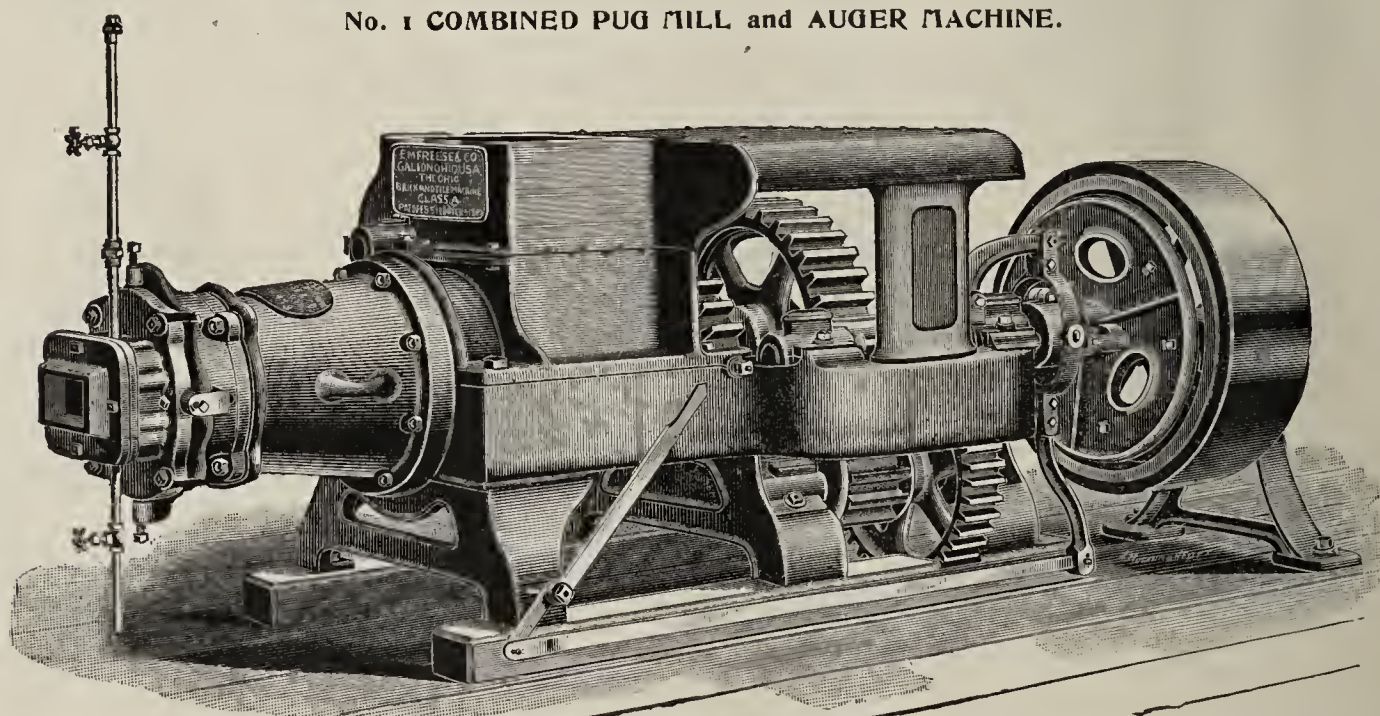
E. M. FREESE & CO., GALION, OHIO.



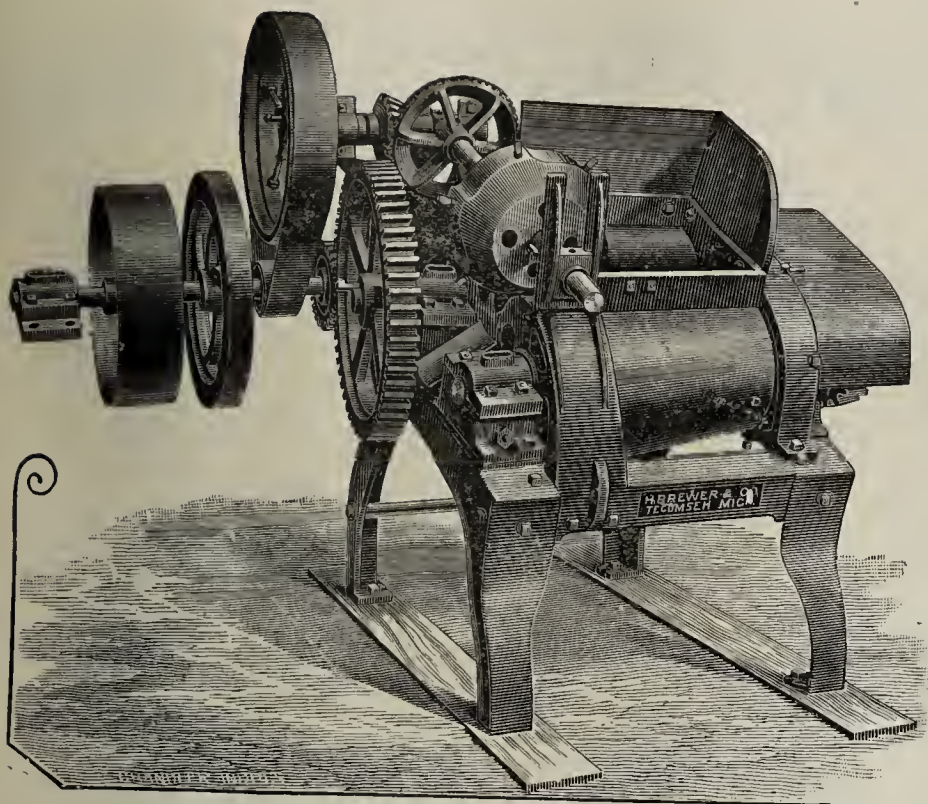
MAMMOTH BRICK MACHINE.



No. 1 COMBINED PUG MILL and AUGER MACHINE.



IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

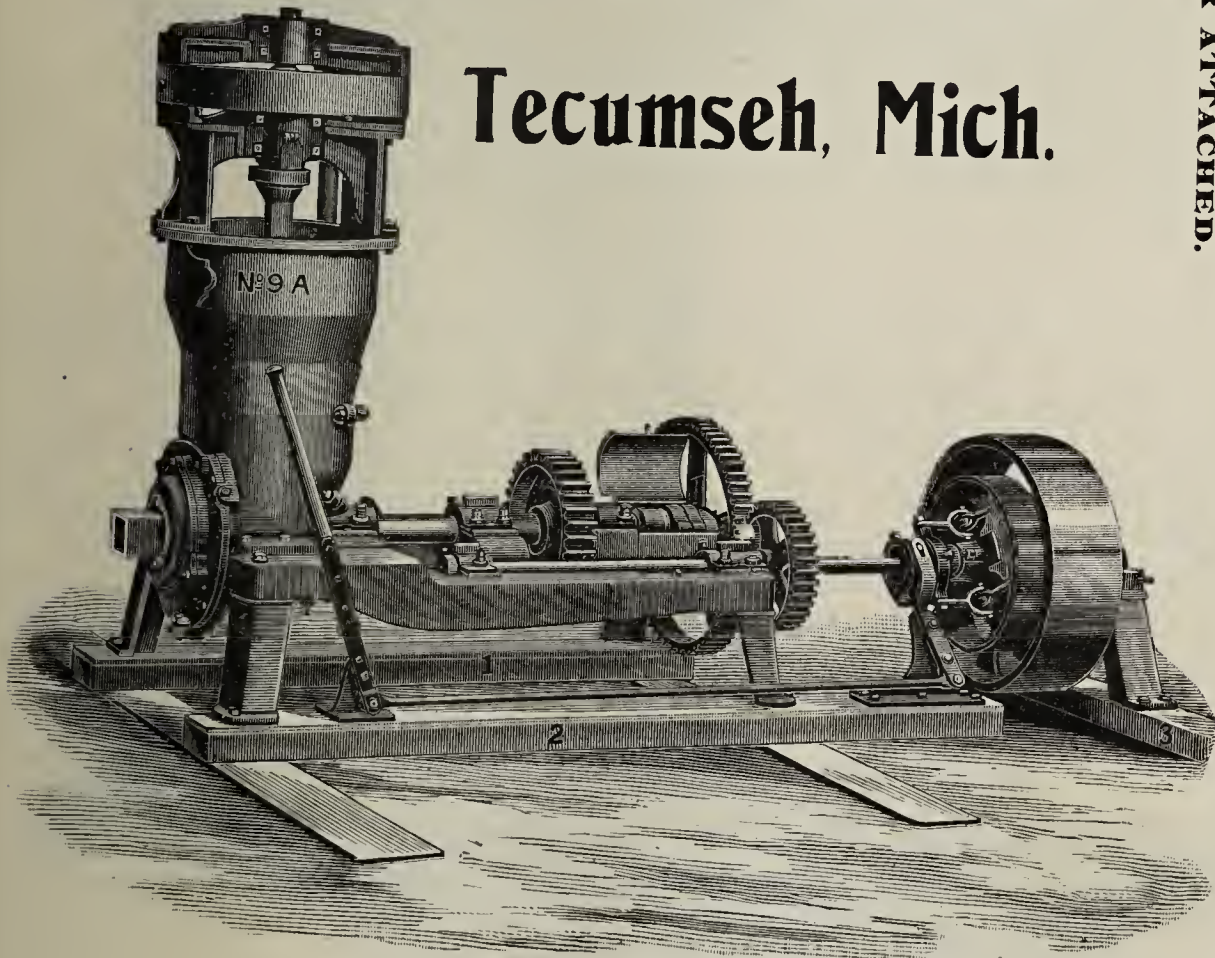


STONE EXTRACTING CLAY CRUSHER.

Manufactured by

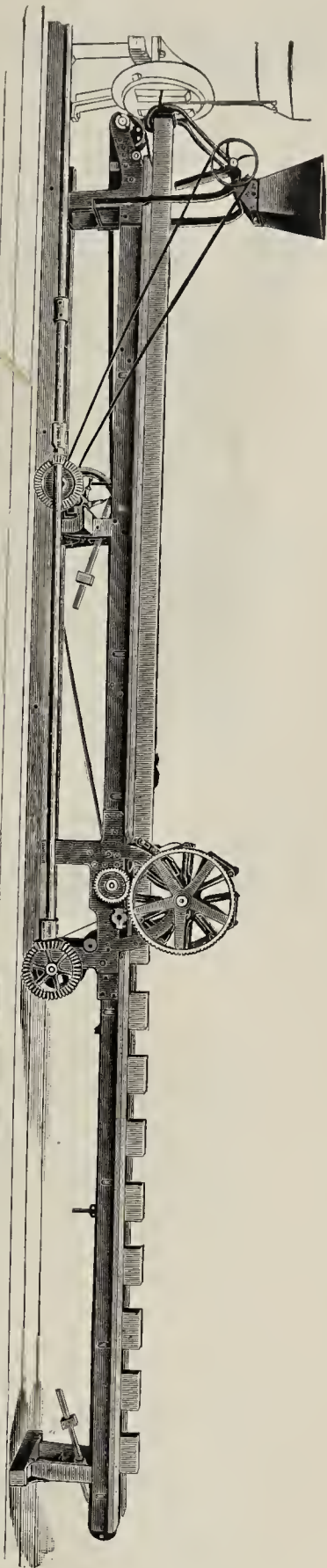
H. Brewer & Co.,

Tecumseh, Mich.

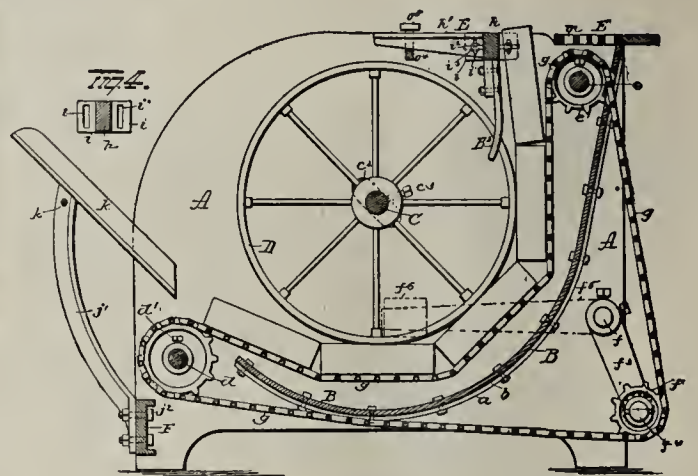
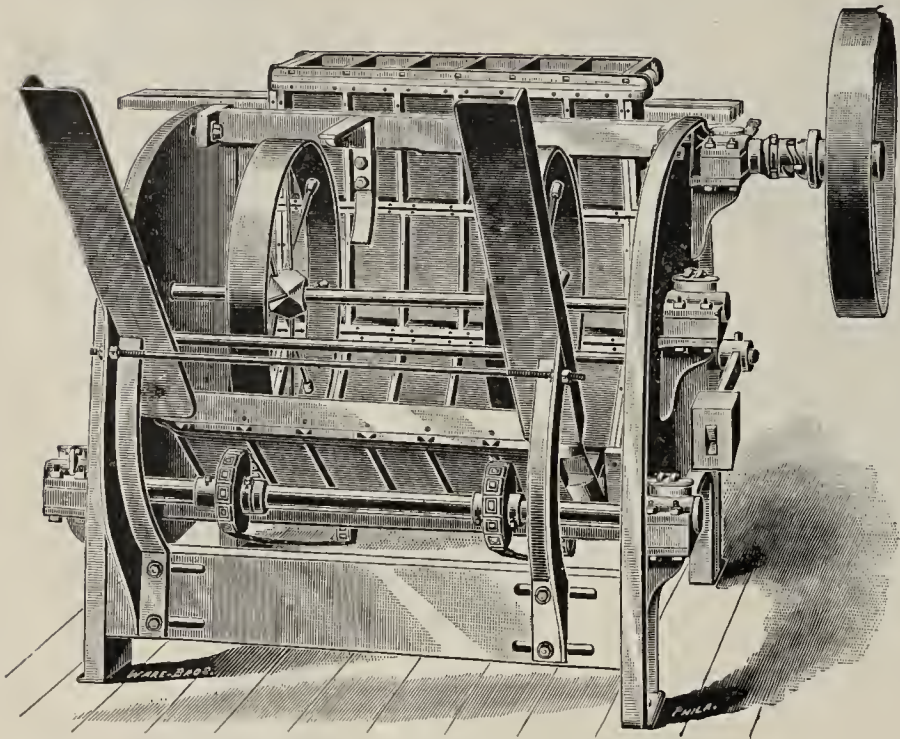


No. 9 "A" BRICK MACHINE.

AUTOMATIC END CUT BRICK CUTTER WITH SANDER ATTACHED.



Horton's Patent Mold Sander.



The only Mold Sander that will sand any size molds without adjustment.

Any Mold Sander manufactured or used with the combination of the main frame, sand box, and a wheel, of an endless chain passing between the wheel and sand box and adapted to receive molds between the chain and wheel and means for automatically applying sufficient tension upon the chain, are Infringements.

The Standard.

OUR line of Clayworking Machinery including Brick Machines, Sanders, Disintegrators, Conveyors, Pug Mills, all kinds of supplies, etc., etc. Is Up-to-date and satisfaction guaranteed. ●●●●

PRICES AWAY DOWN.

For Sale,

At a very low figure:

One Columbian Special Repress, second-hand but practically as good as new.

About one ton of second-hand Grates, from 40 to 42-inch length. A bargain at \$30 per ton.

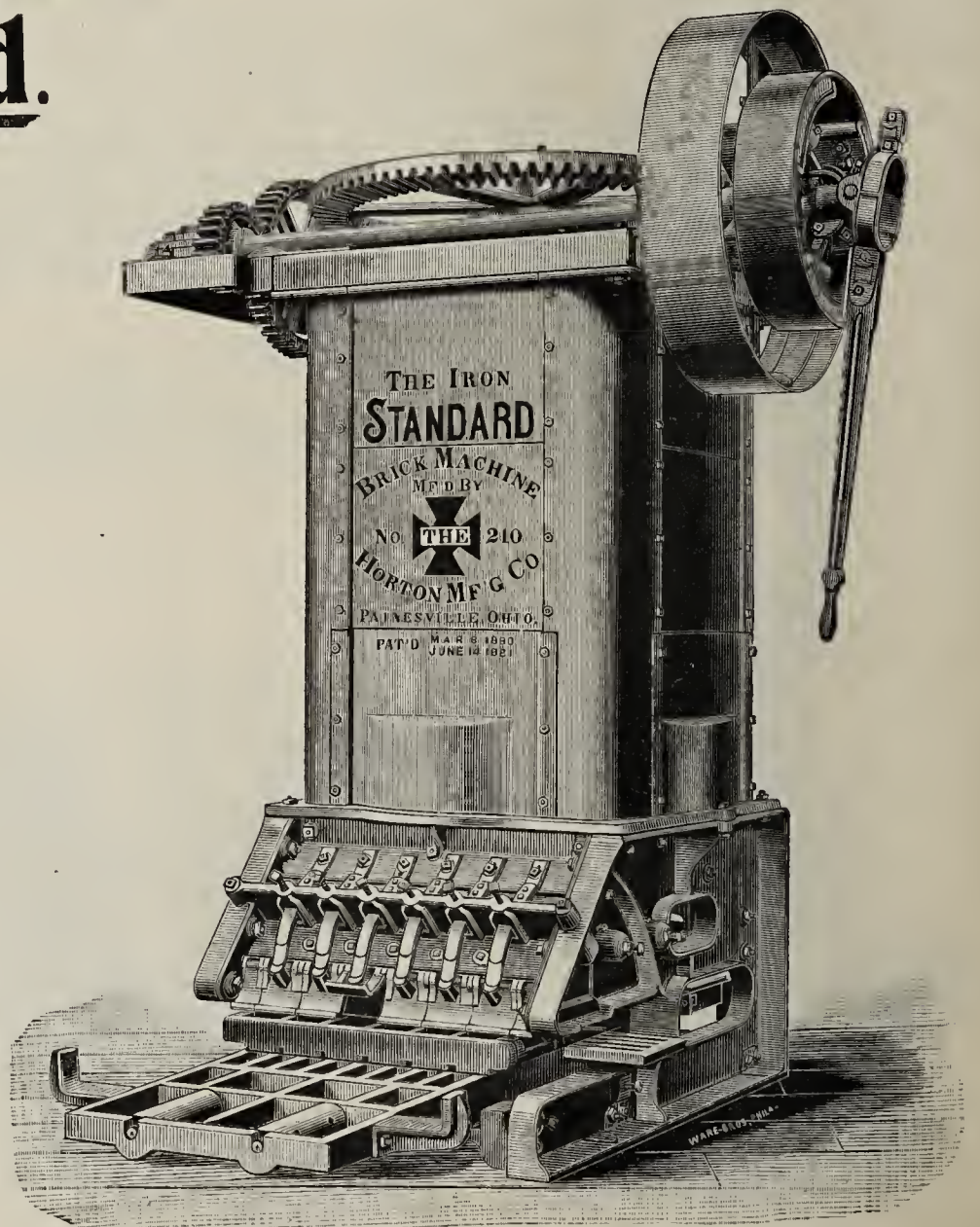
Odd size molds:

5—8 $\frac{3}{4}$ x4 $\frac{1}{4}$ x2 $\frac{3}{4}$

10—9 $\frac{1}{2}$ x4 $\frac{1}{2}$ x2 $\frac{3}{4}$

The Horton M'f'g. Co.,

Painesville,
Ohio.



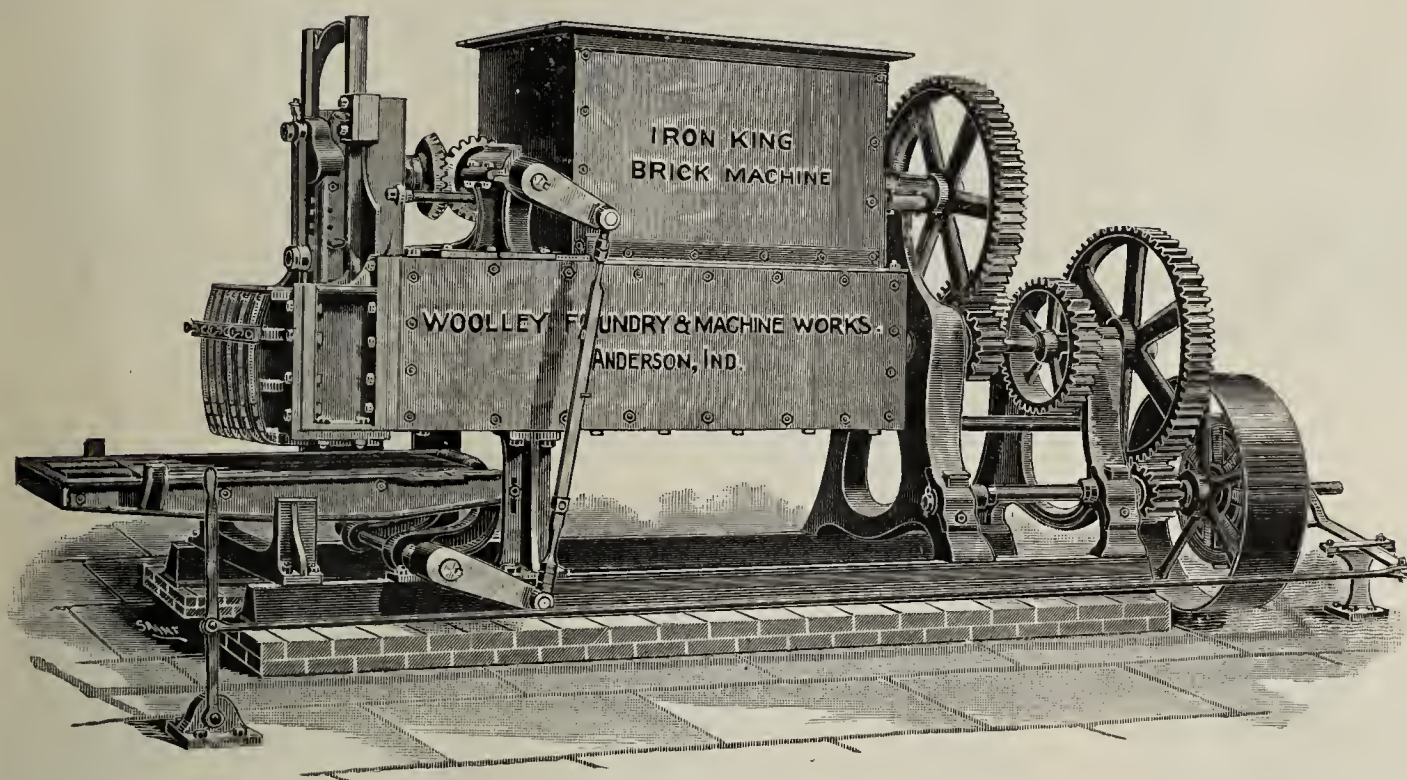
The Iron Standard Brick Machine.

Do You Want A BRICK MACHINE A DRY PAN A PUG MILL?

IF SO, BE SURE AND LOOK INTO THE MERITS OF

The Iron King A BRICK MACHINE that has never made a failure. The Woolley Dry Pan, The Woolley Pug Mill,

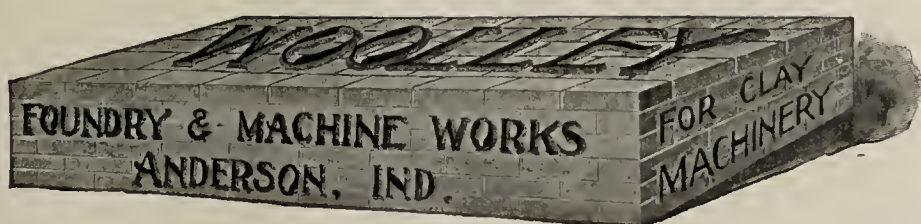
•All of these Machines have proven equal to any and Superior to most on the Market.✶



THIS is a non-breakable machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ability of every part.

We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

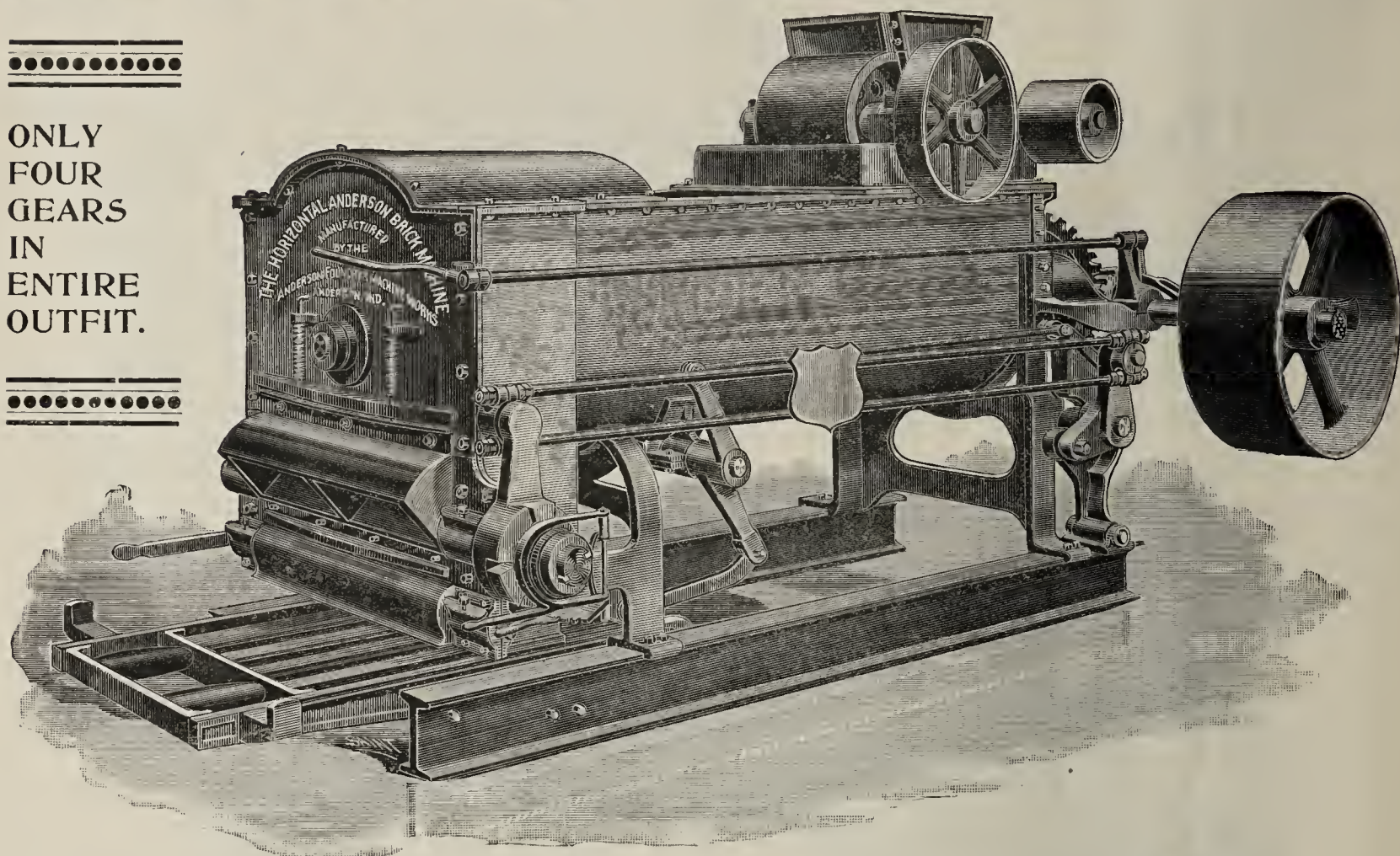
It will afford us pleasure to quote you prices.



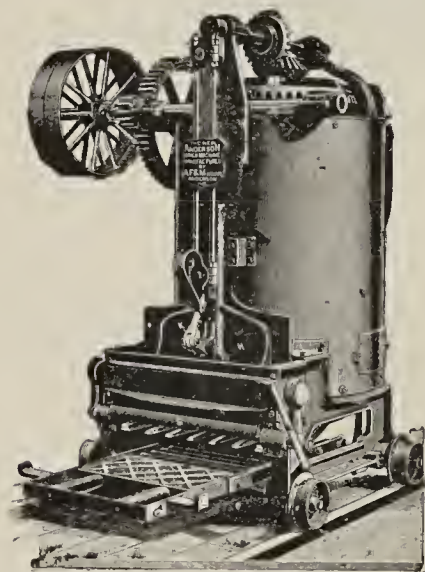
DON'T

Buy a Brick Machine until you Investigate the **HORIZONTAL ANDERSON**. The latest — the Strongest — Greatest Pressure and Pugging Capacity.

ONLY
FOUR
GEARS
IN
ENTIRE
OUTFIT.

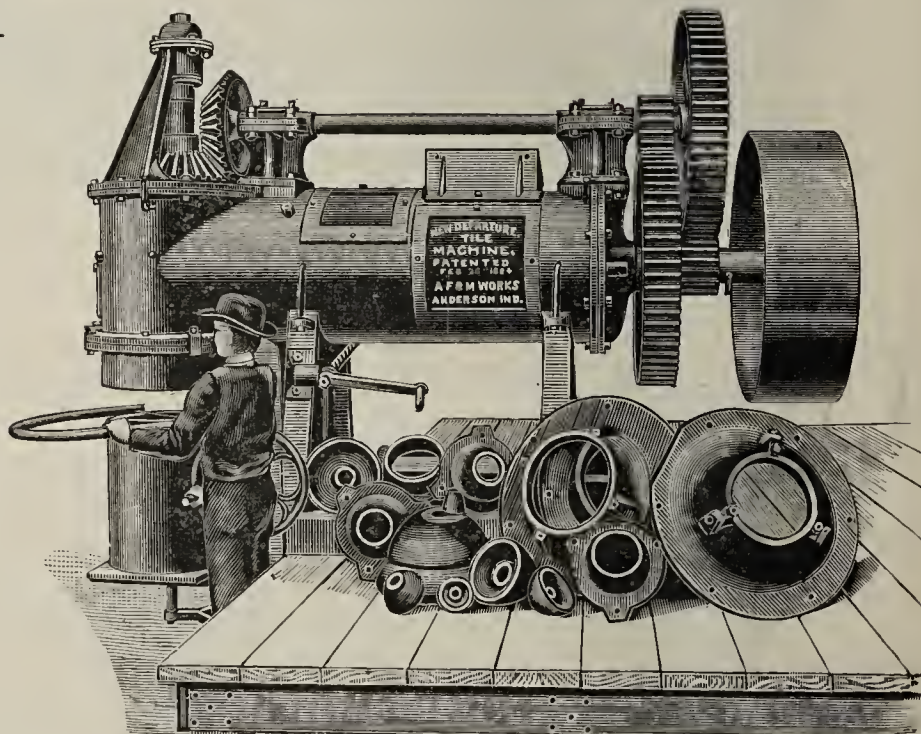


Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

The NEW DEPARTURE TILE MILL.

The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

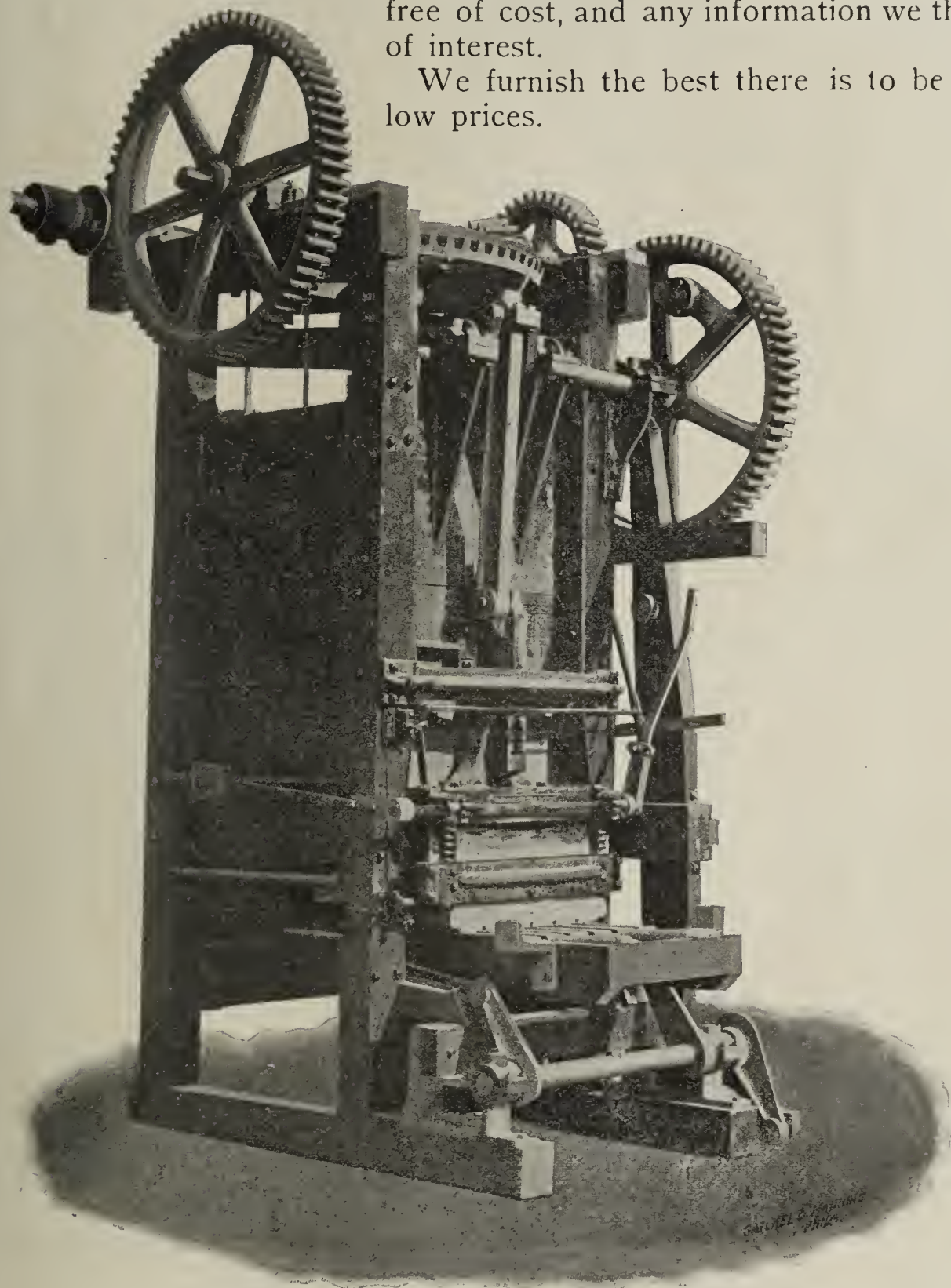
Anderson, Indiana

We Furnish Everything

A Brickmaker Needs.

Let us furnish you with any information you want. We send plans of complete plants free of cost, and any information we think will be of interest.

We furnish the best there is to be had and at low prices.



Letter "A" Weight 10,000 Pounds.

ESTABLISHED 1857.

INCORPORATED 1887.

The Henry Martin Brick Machine Mfg. Co.,

Send for our Illustrated Catalogue.

Lancaster, Penna., U. S. A.

“NEW HAVEN” MACHINES

Are Not Experiments.

Record of . .

One Soft Clay Machine:

One Million Brick a Month

. . . for Eight Years. . . .

Its History Shows that it Has Been Unusually
Successful.

Address —

The Eastern Machinery Co.,

NEW HAVEN, CONN.

WONDER MACHINERY.

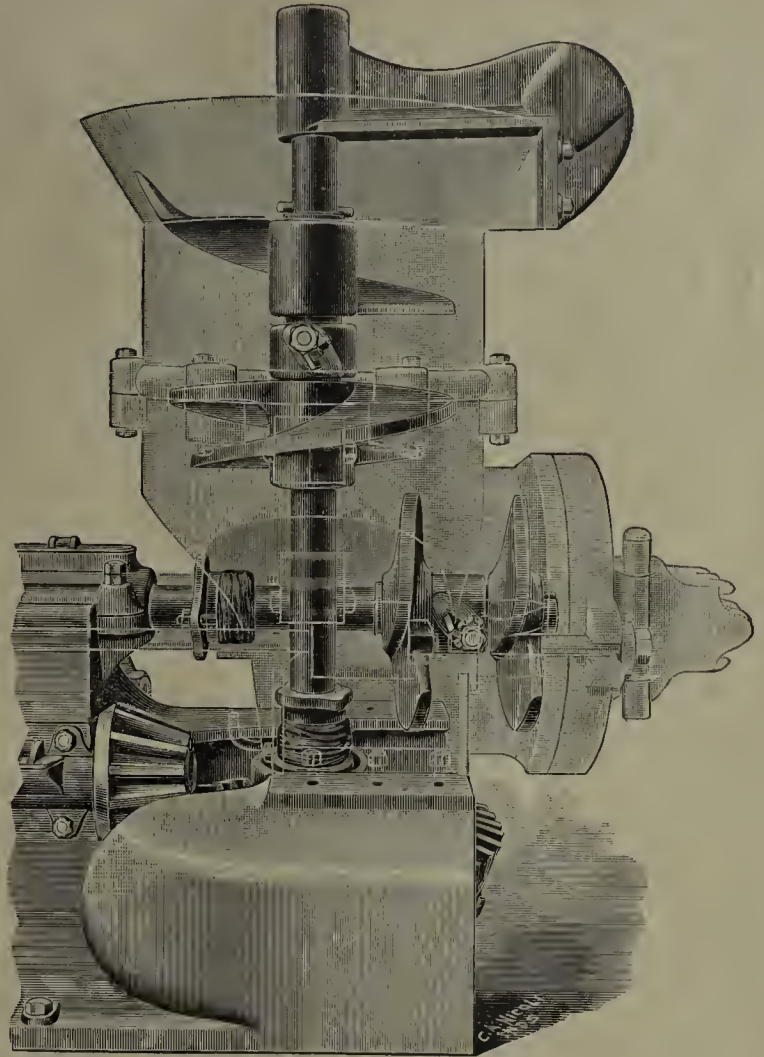
...

Transparent Cut Illustrating Arrangement of Clay Cylinder and Augers.

By this we illustrate a Transparent Clay Cylinder showing the inner construction of all sizes of the Wonder Brick and Tile Machines, showing position the augers and retarding bars occupy, also that there is no journal bearing that the clay can work into and also the means used to prevent the clay from working out of the clay cylinder. By this illustration you will see that we are justified in making the claim that we more thoroughly grind the clay and thereby produce brick with less lamination than can be done by the horizontal auger machines.

Automatic Brick Cutting Tables, either end or side cut, also side cut board delivery and hand brick tables are used with either size of the Wonder machines.

...

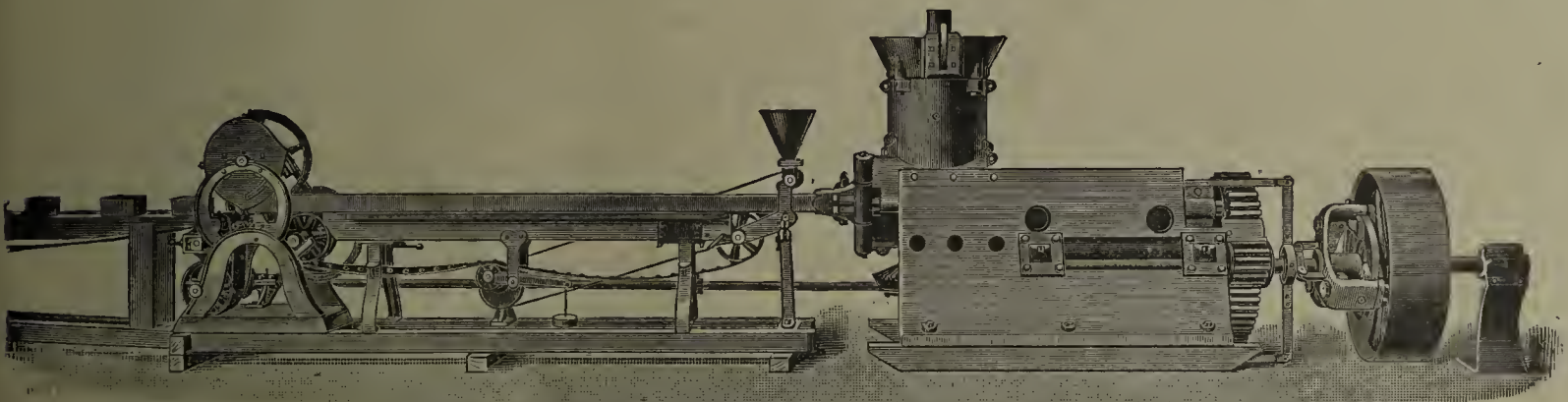


Little Wonder Brick and Tile Machine, 25 M daily capacity.

Intermediate Wonder Brick and Tile Machine, 35 M daily capacity.

Big Wonder Brick Machine, 50 to 60 M daily capacity.

Wonder No. 4 Brick Machine, 60 to 100 M daily capacity.



Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.

AS MANUFACTURED BY

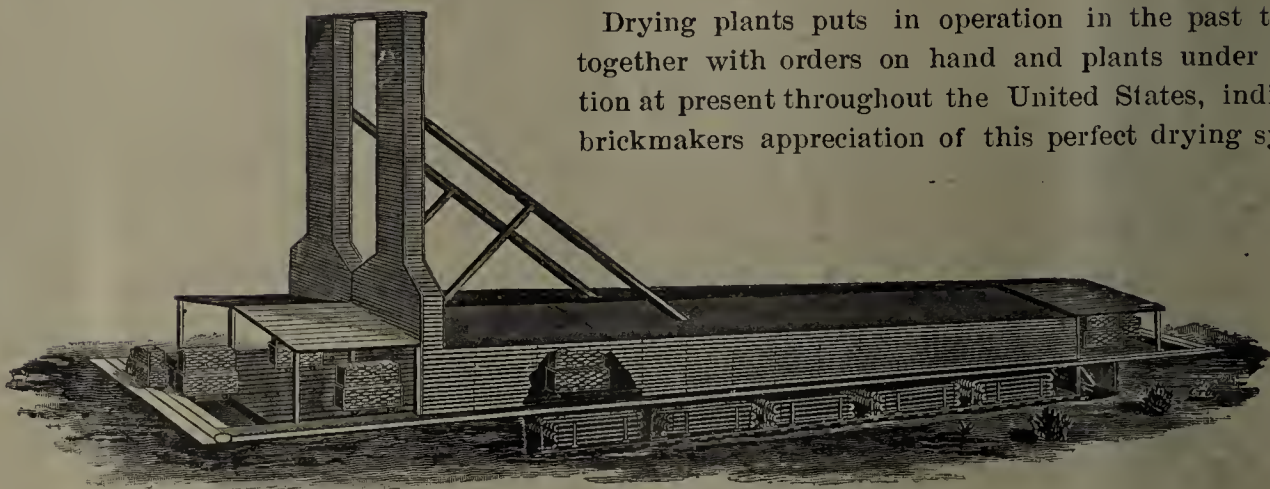
The Wallace Manufacturing Co.,

Send for No. 15 Catalogue for further particulars.

FRANKFORT, IND.

Iron Clad Dryer.....IN THE LEAD

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

•SEE WHAT THEY SAY:•

WM. SANKEY, THOS. SANKEY,
WM. E. SANKEY, F. M. SANKEY,
T. H. SANKEY, J. F. SANKEY.

CAPACITY: 40,000 BRICK PER DAY.

TELEPHONES: { OFFICE, S. S. 11-3.
WORKS, S. S. 11-2.
{ WORKS, E. E. 589.

SANKEY BROS., BRICK.

ORNAMENTAL PRESSED, SELECT STOCK, BUILDING, PAVING AND GUTTER BRICK.

SPECIAL AGENTS FOR MARTIN'S IMPROVED BRICK MACHINE.
RAILROAD SHIPPING A SPECIALTY.

OFFICE: 2101 Carson Street.

WORKS: Head of 18th Street, S. S.
Penn and Atlantic Aves., E. E.

PITTSBURGH, PA., May 3, 1897.

WOLFF DRYER CO., Chicago, Ill.

Gentlemen:—Replying to your inquiry regarding dry house at our east end plant, will say, that it is two years since we equipped that yard. We found the earthy deposit there would make the best quality of stock brick; soft mud process, but would not stand direct heat drying; such as we were accustomed to use, therefore concluded to test this brick in your dryer, resulting in our installing your system, producing results of a most satisfactory nature, proving the excellence and correctness of your system of absorbing moisture from centre to surface by drawing a volume of warm air through the brick, carrying off the moisture and leaving our brick perfect and bone dry, saving us money in burning and producing beautiful color.

Six months experience proved to us that it would pay to install your system at our South side works, which we did one year ago, with equal satisfaction. At this yard, we have shale clay manufacturing soft mud and dry-press brick and was equipped with the best kind of dry floor, heat supplied from natural gas; we sacrificed this and built an Iron-Clad under the same roof. This loss has been our gain; the quality of brick and saving in cost of drying enables us to show a fair profit, which is very pleasing, considering prevailing low prices for brick. We dry all our dry-press brick before setting in the kiln.

Respectfully yours,

SANKEY BROTHERS.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

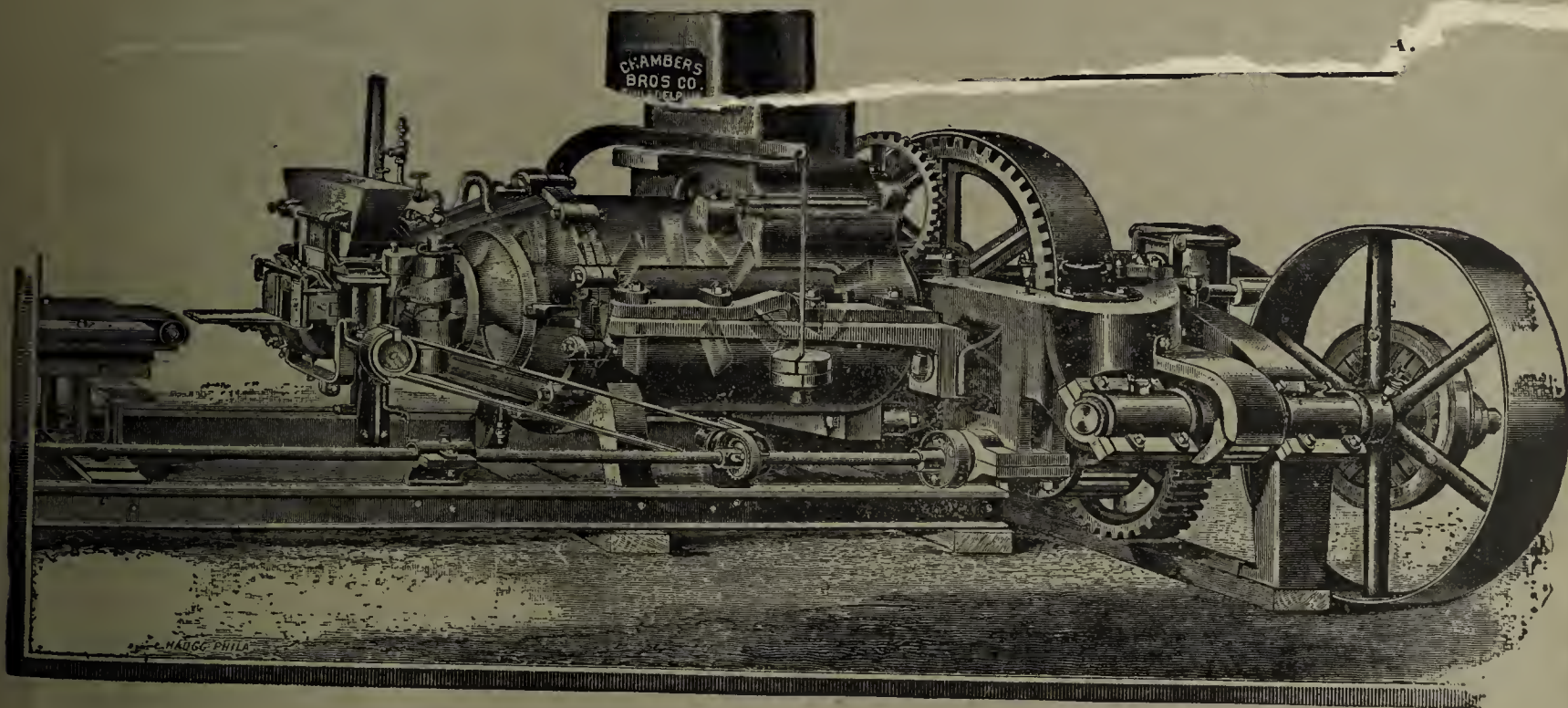
VOL. XXVII, No. 6.

INDIANAPOLIS, IND., JUNE, 1897.

\$2.00 a Year in Advance.

OUR SPECIALTY IS STIFF TEMPERED BRICK MAKING ...MACHINERY.

We aim to Build only the Best in its Class.
It has Paid our Customers to Buy and Use our Machines.
We Believe it would Pay You.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,

171 South Clinton Street.

PHILADELPHIA, PA.

Coming to the Front,

The RICHARDSON REPRESS.

• • • •

We have received recently orders for this Repress from three well-known brick companies—one order being for the second machine.

Two of the companies have been using Represses for years, and know a good thing when they see it.

We make brick presses for every requirement, and molds and dies for ornamentals and special shapes.

We make many other things that you ought to know about.

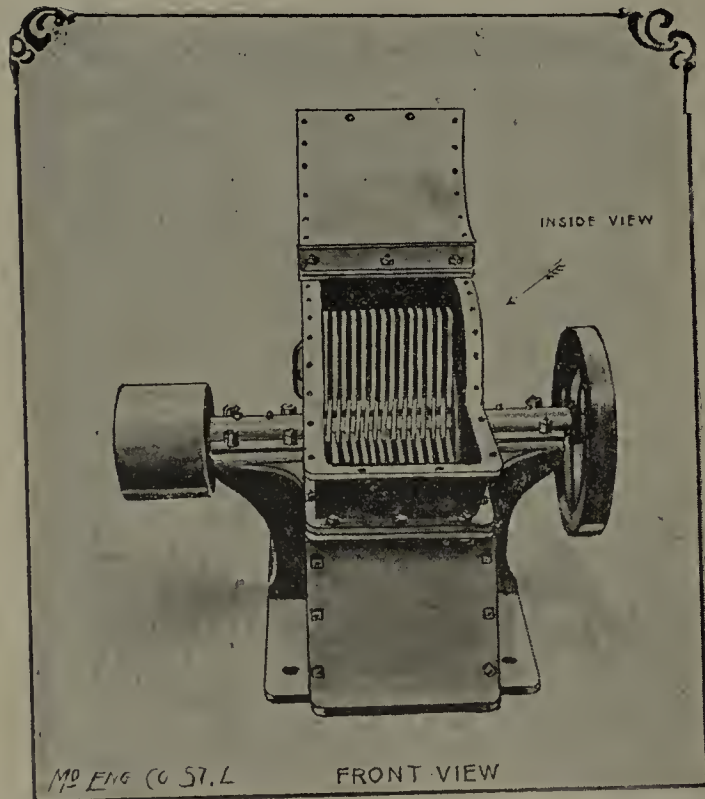
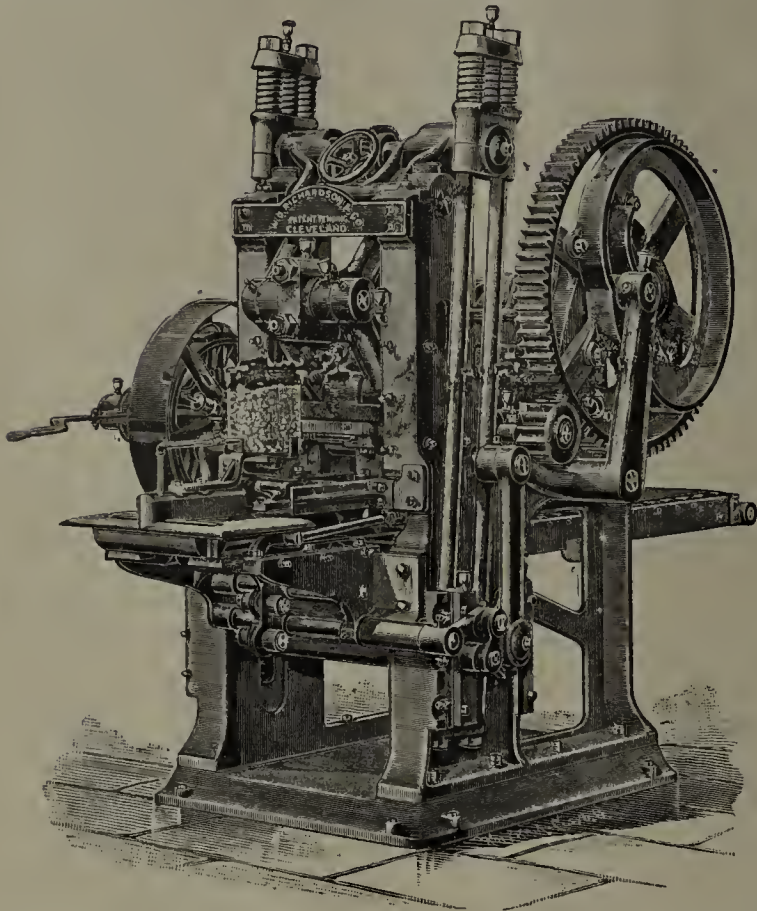
Write for information.

• • • •

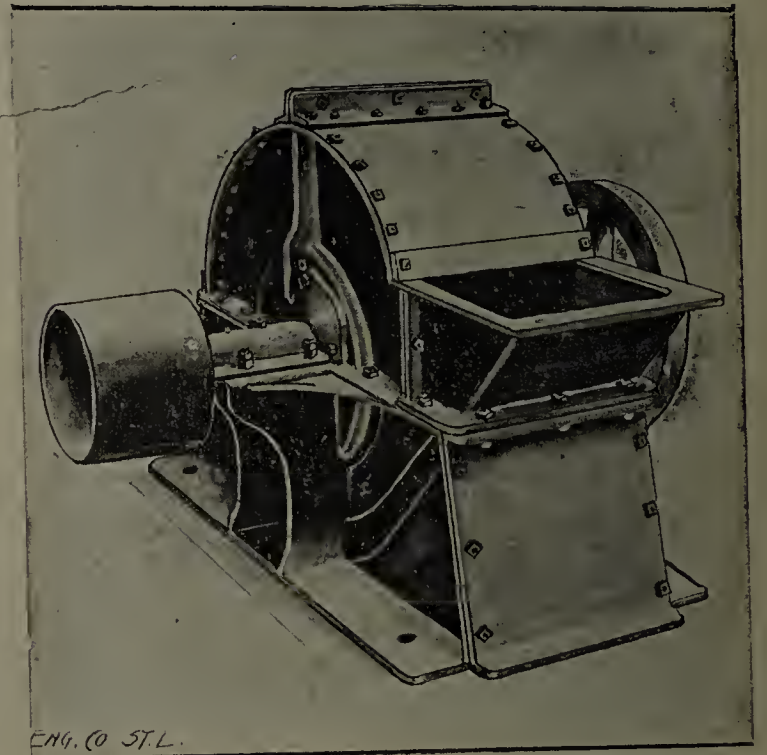
The Ohio Ceramic Engineering Co.,

59-63 Center Street

CLEVELAND, OHIO.



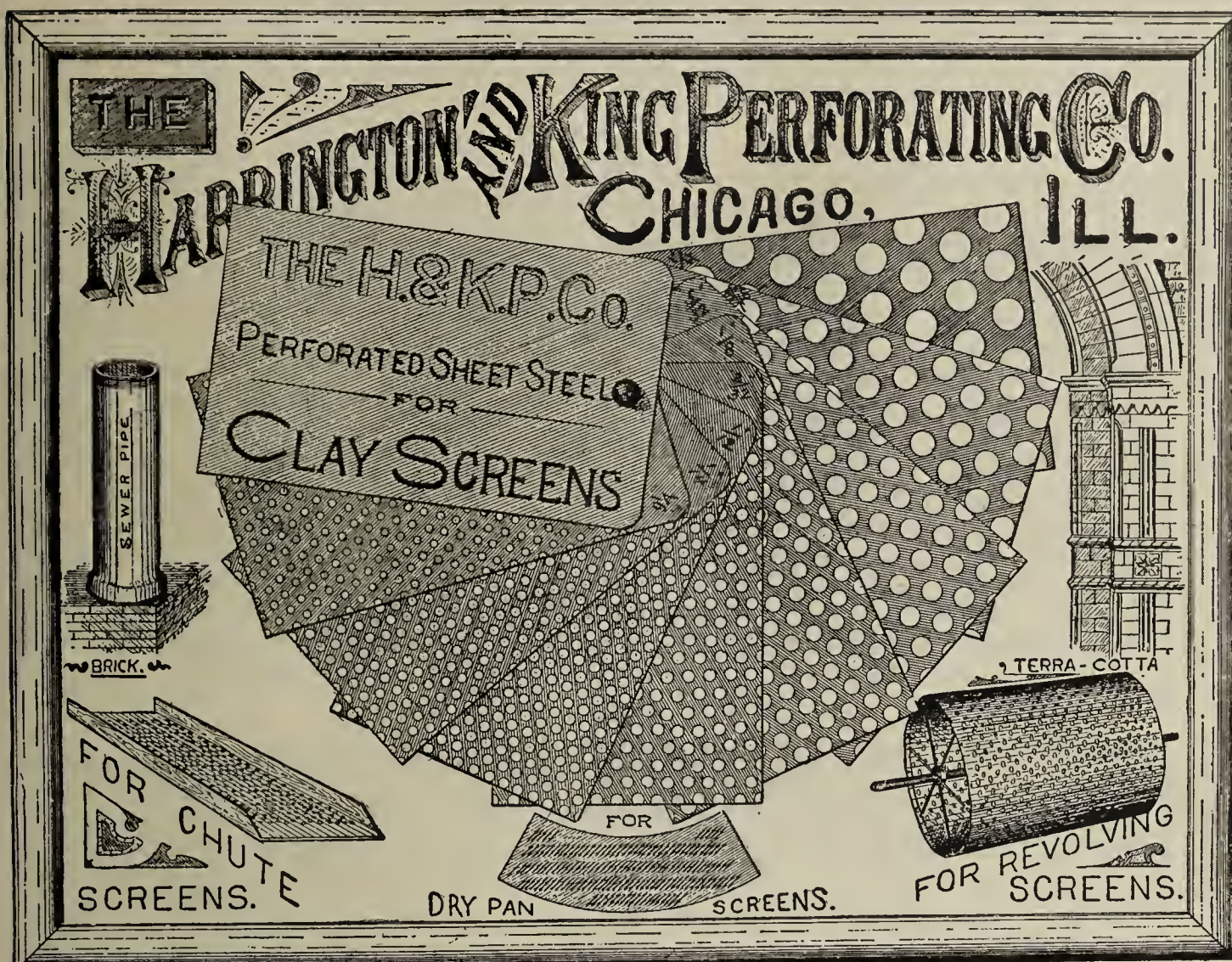
THESE MACHINES are FULLY GUARANTEED.



NEW IMPROVED PATENT LIGHTNING BREAKER AND PULVERIZER.

These machines are far superior to anything of the kind in the market, being provided with our patent self-oiling dust-proof boxes, they can be run at a much higher speed than any other. As the principle of pulverizing is in the momentum, or quick motion of a machine, the advantage can readily be seen. For particulars and prices call on, or address the

SCHOELLHORN-ALBRECHT MACHINE CO., Dealers and Manufacturers of Engines, Boilers, Machinery and Supplies of all Description. 609 and 610 North Levee, St. Louis, Mo.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.

IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

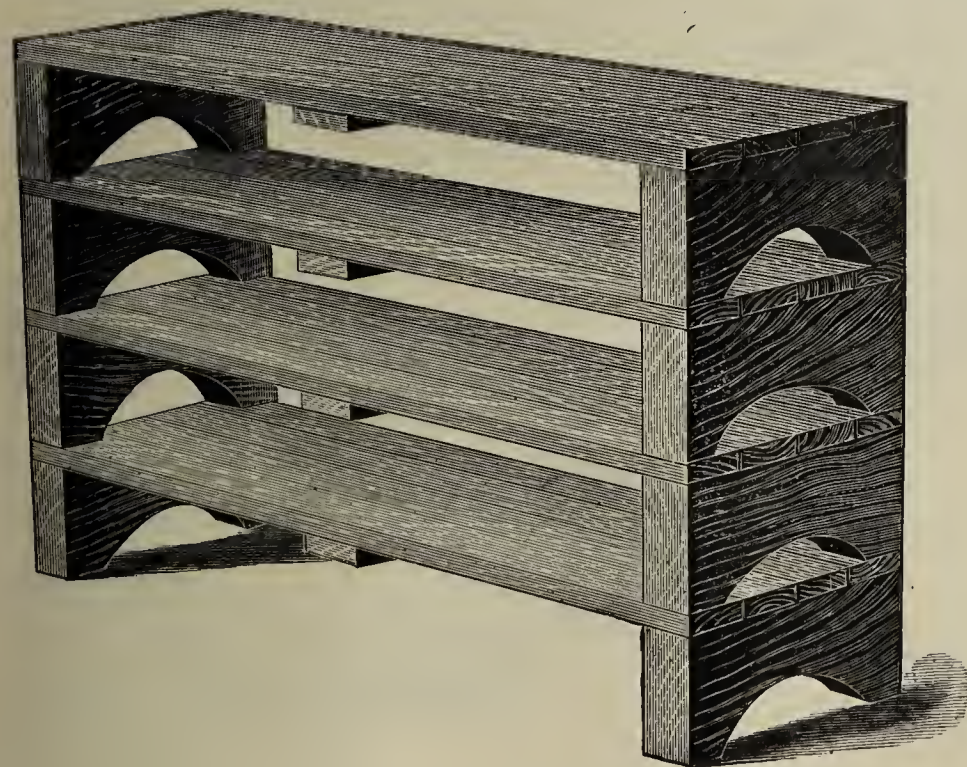
Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.



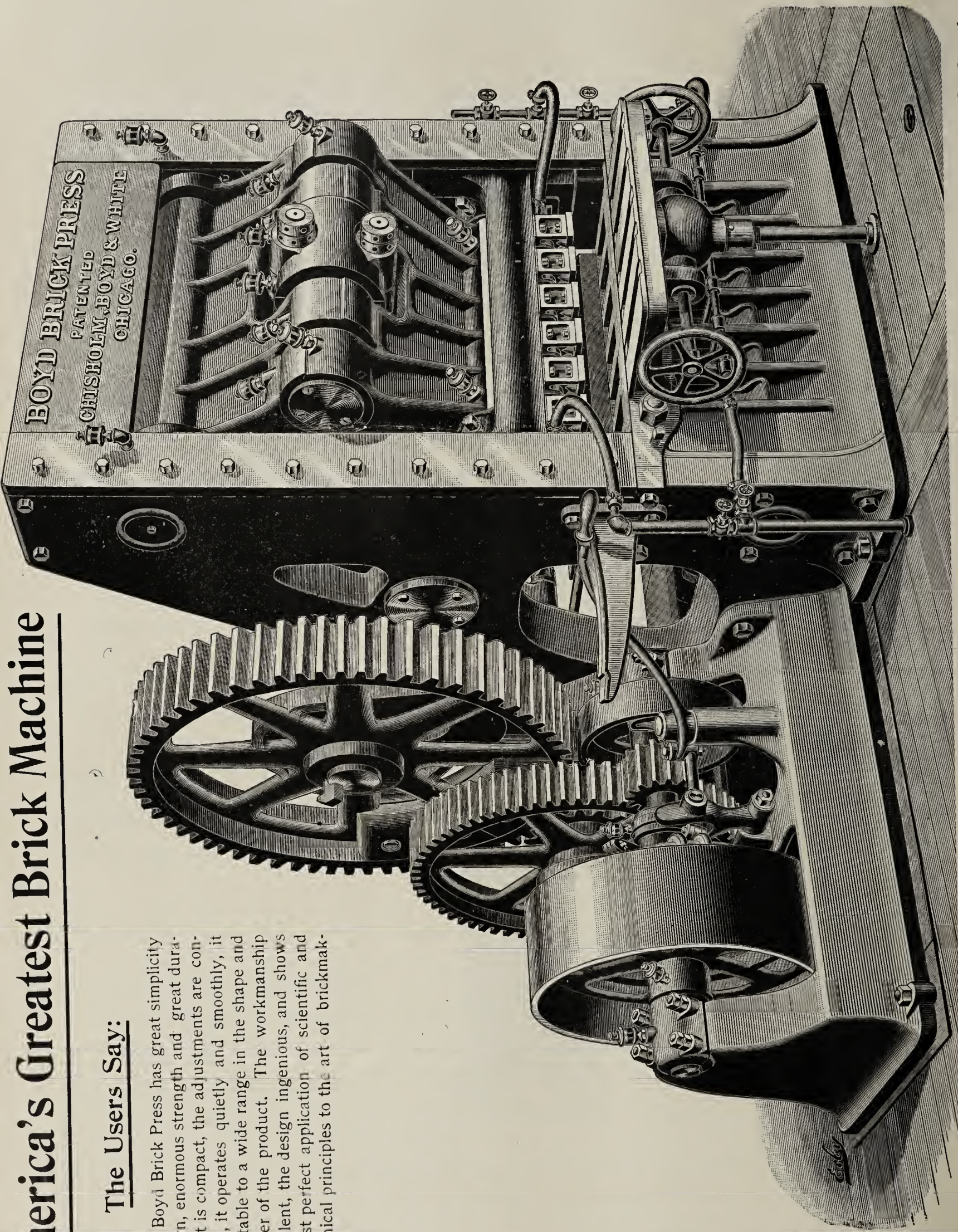
Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., - Saginaw, East Side, Mich.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,
57th and Wallace Streets,

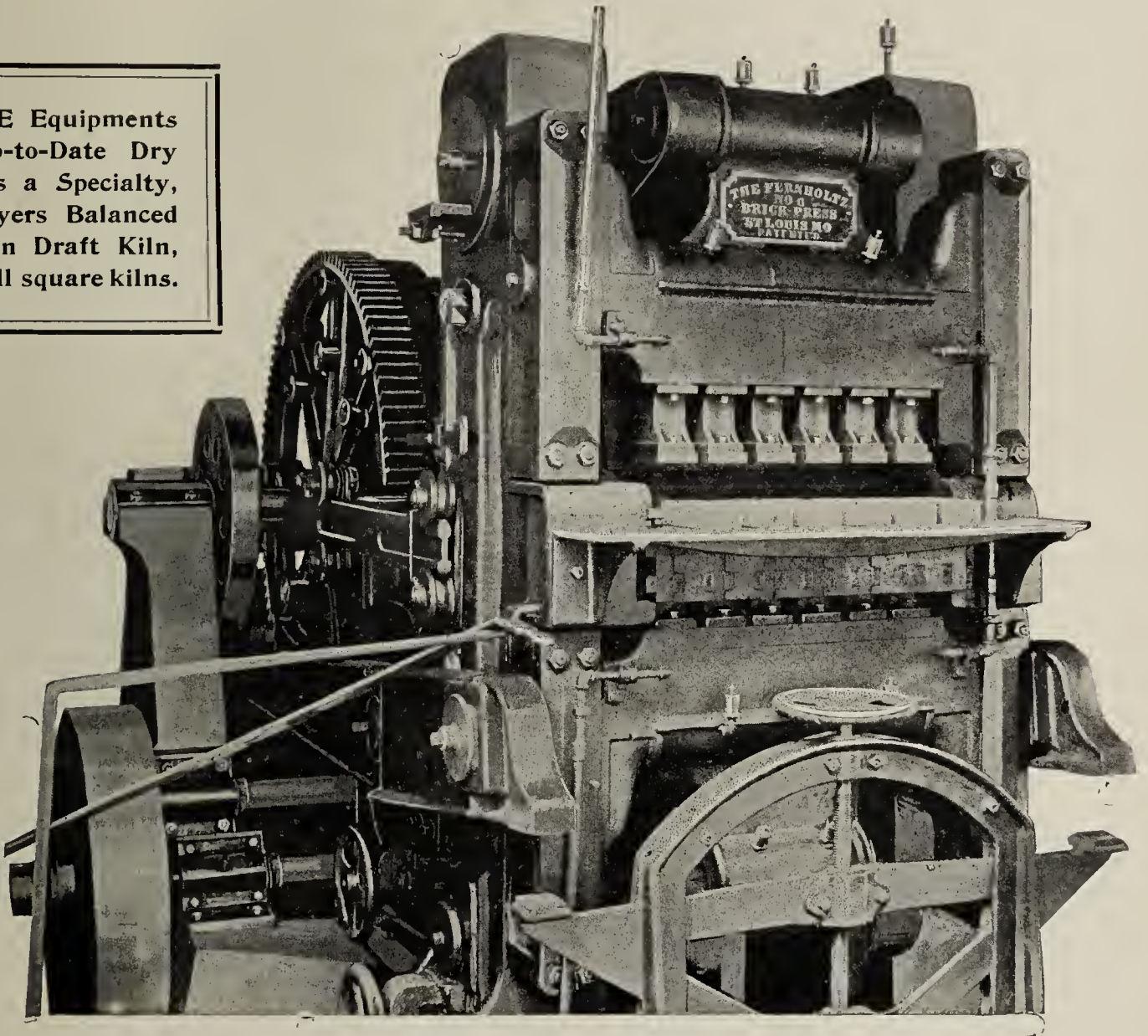
CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequaled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMPLETE Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

1214 and 1216 Poplar Street,

ST. LOUIS, MO.

Announcement.



THE splendid reputation established for our Brick Press has been due to a determination on our part to have a superior machine; one that would give the utmost satisfaction. How well we have accomplished this is shown by its record. This record and the many eulogiums passed upon it prove that it is the **Standard of the World.**

We are making a new dry press and other new machinery, and are starting a new and extensive machine works in Chicago, where we will manufacture a complete line of Clay Working Machinery of every description.

We thank our many friends for past favors and hope we may secure a continuance of their patronage.

Write us for catalogues and estimates.

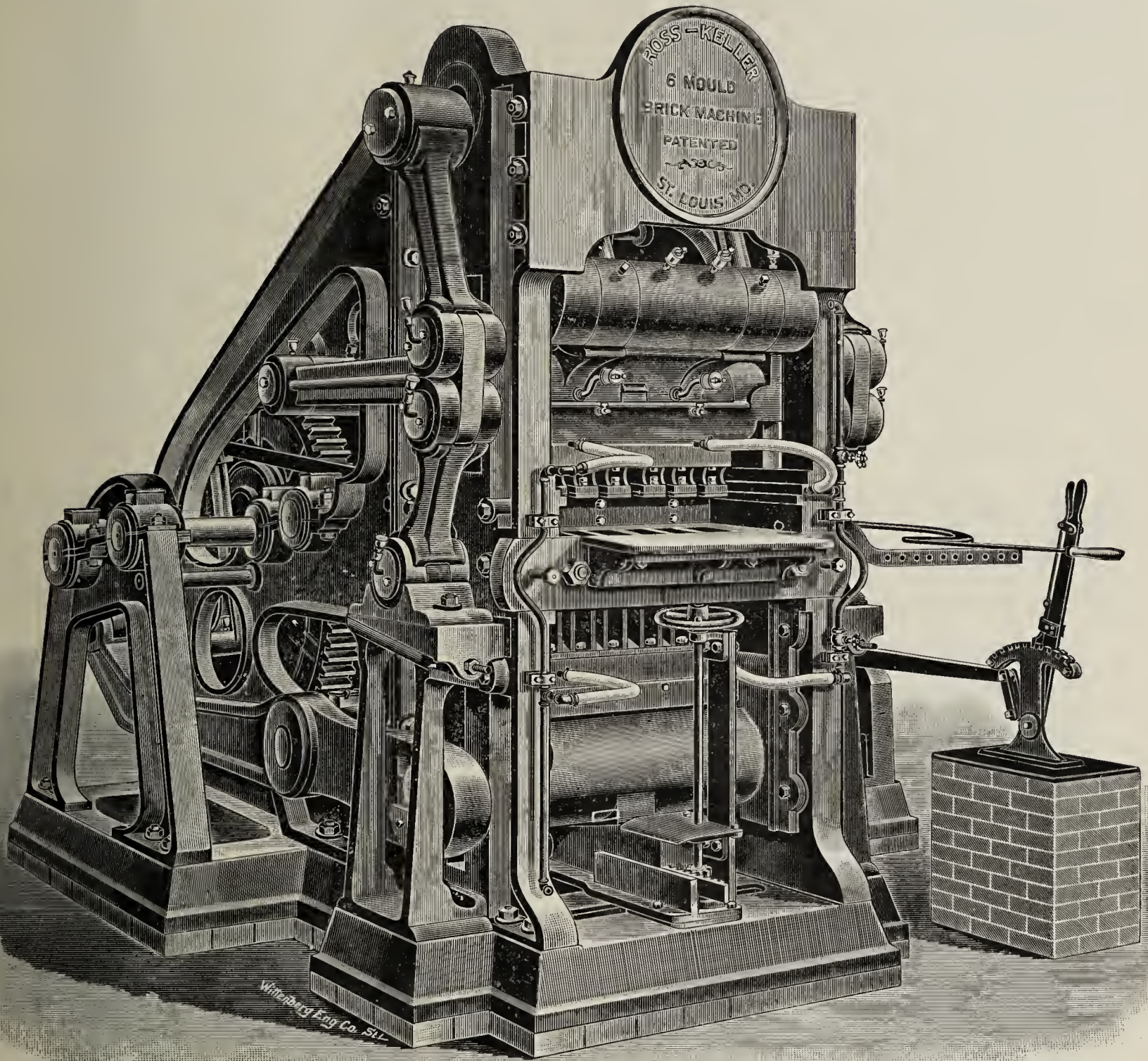
The Simpson Brick Press Co.,
CHICAGO, ILL.

Manufacturers and Contracting Engineers for every branch of Clay Industry.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

ST. LOUIS, MO., U. S. A.

"A Clay Pulverizer of Wonderful Capacity."

SO SAY ALL WHO HAVE USED IT.

Bradford, Pa., May 15, 1897.

Messrs. MILTON F. WILLIAMS & CO., St. Louis, Mo.,

Gentlemen:—We have been running your Shale Pulverizer for about five months, using hard Shale that has to be thoroughly wet all the time in order to make a fine brick, and we can heartily state that the machine will pulverize, either Shale or Clay, wet or dry, finer and much faster than any machine we have ever used or seen; and we therefore consider it the most useful and economical Pulverizer that has ever been placed before the progressive Brickmakers of this country.

The machine will pulverize, of dry Clay or Shale, from 80 to 120 square yards per day. If Clay or Shale is very damp or wet, from 40 to 60 yards. It will pulverize this amount of Clay fine enough so that it will pass through a screen 18 mesh No. 22 wire.

Believing that these are better results than we have ever seen from any other clay-crushing machine, we therefore consider it the most useful pulverizer that any Brick Maker can have.

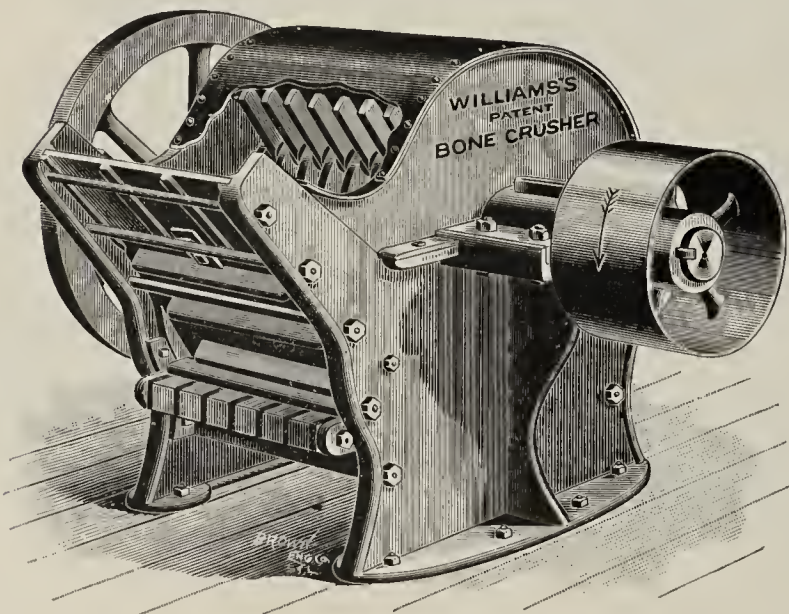
Wishing you every success, we are

Yours truly,
NATIONAL BRICK COMPANY,
P. B. BROUGHTON, Supt.

We can send you many more like this.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

Our Pulverizer is fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.

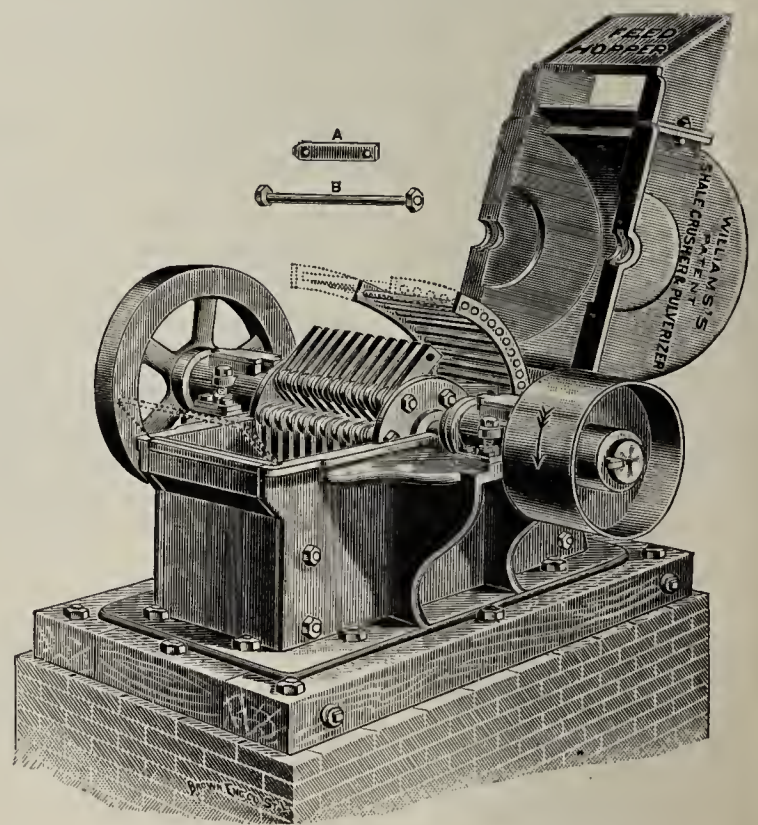


Williams's Shale Breaker.

THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

The Williams Patent Crusher and Pulverizer Co.
2705 North Broadway, - - St. Louis, Mo.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

Columbia Brick Press.

All working parts are made of Steel.

The pressure is exerted from both top and bottom; consequently there is no lateral strain on the machine.

The pressure is absolutely equal on top and bottom of brick.

A brick with granulation cannot be made on this machine.

The liners on mould can be taken out and replaced in five minutes, without removing any other part of the machine.

Any part of the gearing can be removed without taking machine apart.

The mould box can be taken out in a few minutes, without disturbing the other parts of machine.

The "COLUMBIA" presses clay or shale as dry as a hydraulic press, or so damp as to approximate a stiff mud brick, so that the range of products is from building brick to pavers. No other press does such a variety of work.

The "COLUMBIA" is the only brick press on the market that meets ALL the needs of a brick plant.

For circulars and prices, address

H. B. HILGEMAN,

General Agent "COLUMBIA Brick Press,
... and "COLUMBIA" Mould,

306 Oriel Building, ST. LOUIS, MO.

Terrazo Cement Tiles.

Complete Plants furnished for making the celebrated "TERRAZO" Tiles. Used to the exclusion of all other tiles in all floors, halls, etc., of the following among hundreds of structures in Germany:

JOHANNIS CHURCH, ROYAL AGRICULTURAL COURT, ROYAL DEPARTMENT OF THE INTERIOR, DRESDEN; GERMANIA PALACE, BERLIN AND ANHALT RAILROAD DEPOT, IMPERIAL ART AND MECHANICAL MUSEUM, ROYAL MILITARY ACADEMY, BERLIN; IMPERIAL POST OFFICES, DRESDEN, BERLIN AND
..... LEIPZIG.....

Terrazo Tiles, any color, design or size. For circulars, estimates, etc. Address

H. B. HILGEMAN,

General Agent of THEO. WELGE, for the sale of Dr. BERNHARDI SOHN, G. E. DRAENERT, GERMANY, Machinery and Processes for making TERRAZO CEMENT TILES.

306 Oriel Building, ST. LOUIS, MO.

THE ANDRUS DOUBLE PRESSURE 4-MOLD BRICK PRESS.

Produces the finest pressed brick from dry or semi-dry clay at less cost than common brick by any other process. This press is the **Simplest** and the **Strongest** press on the market, and has given **universal satisfaction** to purchasers. We guarantee it against breakage for **5 years**.

Send for descriptive catalogue.

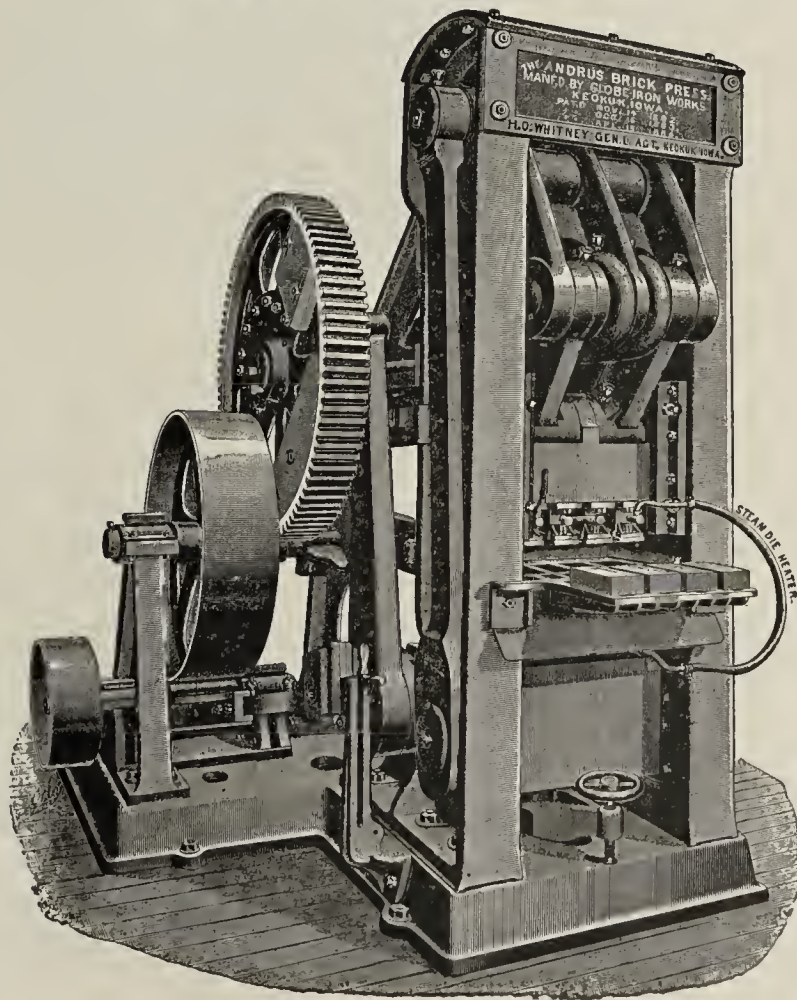
Address, _____

H. O. Whitney,

General Agent,

GEN. OFFICE AND
FACTORY.....
KEOKUK, IOWA.

KEOKUK, IOWA.





BRICK DRIER

Or any article, for that matter, that has no quality other than its cheapness to recommend it, is a pretty good thing to leave alone.

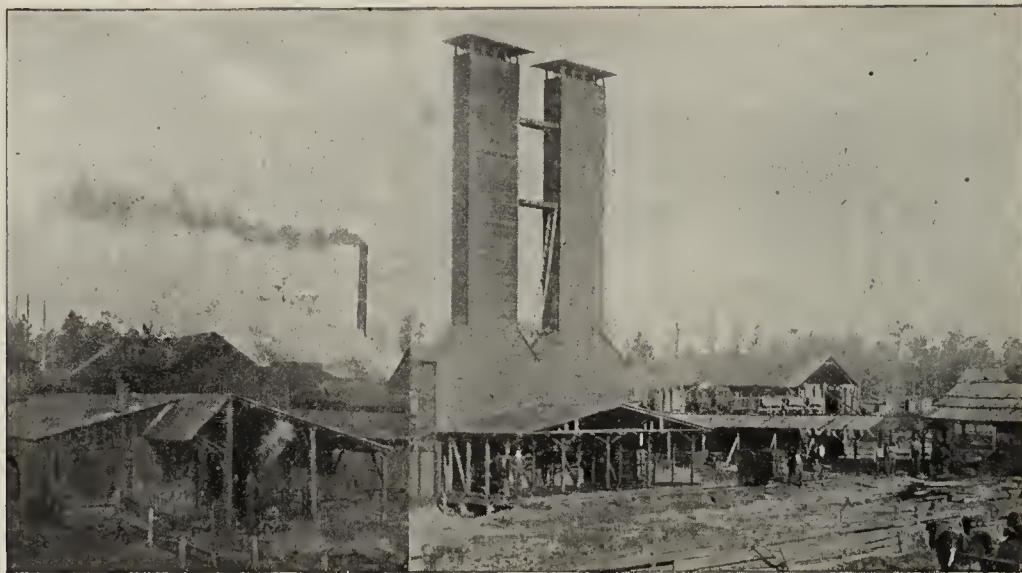
The STANDARD IMPROVED BRICK AND TILE DRIER

does not belong to this class; it has real, genuine merit; it is appreciated for its intrinsic worth; it is acknowledged to be the criterion by which the excellence of all others is judged—hence the expression frequently heard, "Just as good as the STANDARD."

In buying anything, whether a Drier, a railroad or a mule, it is the part of wisdom to consider QUALITY and RESULTS, AS WELL AS PRICE.

On THIS, the TRUE basis of comparison, WE DEFY COMPETITION.

The testimonial letter given below is offered as evidence of the high esteem in which the STANDARD DRIER is held.



OFFICE OF THE SUMMERVILLE BRICK WORKS.

The Standard Dry Kiln Co., Indianapolis, Ind.

Summerville, S. C., December 8, 1896.

Gentlemen—It affords me great pleasure to have the privilege of testifying to the merits of your eight track Drier erected at my works in place of the ——— Drier, which was destroyed by fire last April.

In contracting with you for this Drier I was very particular in making you guarantee to dry 40,000 brick per twenty-four hours. After giving it six months' trial, I have concluded that you could have safely guaranteed 50,000.

Your Heating Apparatus I consider perfect. It is easily kept in order—in fact, I have done nothing to it since its installation. It does its work effectually, drying the output of my Chambers Machine, 40,000 per day, without being forced in the least. I cheerfully recommend your Drier to any one wanting the best and most economical one on the market.

Wishing you much success, I remain,

Very truly,

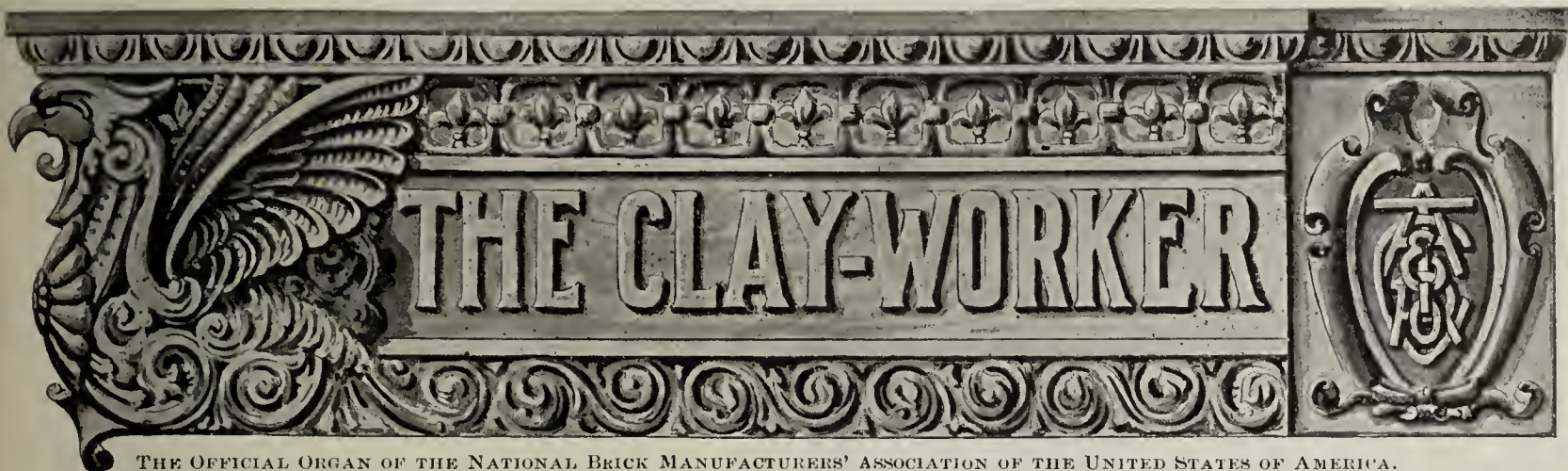
A. W. TAYLOR, Propr.

OUR NEW CATALOGUE No. 35

Contains a great many indorsements fully as emphatic as the above. A perusal of

them will satisfy you, we believe, that every claim made for the STANDARD DRIER is verified by actual work. It also illustrates and describes our Equipment, including our new Steam-Saving Appliance, you will find it profitable reading. If we knew your address, we would send you a copy.

The Standard Dry Kiln Co., 186 South Meridian St.,
INDIANAPOLIS, IND.



VOL. XXVII.

INDIANAPOLIS, IND., JUNE, 1897.

No. 6.

Written for the CLAY-WORKER.

CERAMIC EMBELLISHMENT IN ARCHITECTURE.

BY EDWIN ATLEE BARBER.

THE GENERAL USE of terra cotta ornament in architecture in this country dates from the Centennial Exposition, although several ineffectual attempts had been made previous to 1876, by prominent architects, to introduce an art which in Europe had been established for several centuries. During the past score of years, however, the progress which has been made in the modeling of architectural terra cotta is truly wonderful, and in every city we can find numerous prominent buildings which are monuments to the skill and genius of our terra cotta sculptors, some of the best of whom have devoted themselves to the modeling of statuary, portraits of eminent men in the world's history and allegorical figures. This work, being on a large scale, requires bold and vigorous treatment. The various details and features, which are executed in heroic proportions, must be so correctly modeled that they will appear harmonious and accurate when reduced and softened by distance.

At first a limited number of stock designs were prepared, which could be duplicated to any extent desired and furnished to architects as needed, but the preparation of special designs gradually crowded out the stock patterns, until they are now the exception rather than the rule. The majority of public buildings of any importance now erected are embellished with original and elaborate designs worked out in terra cotta, bearing some special

and appropriate significance. Thus the Drexel Institute building in West Philadelphia has a colossal archway over the main entrance, around which are set large medallion busts of world-famous men who have been prominent in statesmanship, art, science, music, poetry and navigation. One of these medallions, representing government, shows a relief portrait of Thomas Jefferson. They are executed in buff clay to match the yellow brickwork of the structure, being the production of a Philadelphia company.

The New York Architectural Terra Cotta Company has furnished architectural designs for a large number of buildings in all parts of the United States, among which is the new gymnasium at Yale College. One of the designs, which embellishes the tympanum in facade, illustrative of athletic sports, represents the national game of baseball.

But while this now firmly established art was in the transition state, many experiments toward architectural embellishment in other directions were attempted by decorators.

In 1874 a prominent architect in New York City worked out a novel design for the front of a four-story building which stood on Broadway, near Grand street. The celebrated Alhambra Palace at Granada, Spain, suggested the decorations, which were painted by the well-known ceramic artist, Mr. Edward Lycett, on large enameled iron plates, which, when bolted to the iron frame of the store front, formed a finished design, both effective and artistic. The plates were of various sizes,



MOOSAIC TILE DESIGN. COAT OF ARMS OF LOUISIANA. In the United States Government Building at Baton Rouge

some of them measuring more than three by six feet, and these were attached to the face of the building, covering the entire spaces between and above the windows and doors to the top

of the structure. The Arabesque designs were boldly outlined in black on the enamel and filled in with brilliant colors, in which blue and red predominated. The iron plates were produced by the Scott Siddons Enameling Company, of New York.



"GOVERNMENT," in arch of Main Entrance Drexel Institute, Philadelphia.

under the direction of an assistant in the office of the architect. This was doubtless the most gigantic piece of ceramic painting ever executed in America and reflected great credit on the designer and the artist. But the experiment did not prove satisfactory, as the bolt-holes in the corners of the plates admitted moisture, which in time rusted the iron and stained the enamel, so that it became necessary to paint over the entire surface, in imitation of a stone front. I do not know whether the structure is still standing, or whether it has been removed to make room for a more modern style of building.

The horizontal plate that is here figured formed a part of the design near the top, while other panels extended on either side of it. All of these plates were, of course, fired in a kiln after being painted, in the same manner that decorated china is treated. Yet it can readily be understood how great were the difficulties to be overcome before such large plates could be handled and fired successfully in a decorating kiln.

To the use of terra cotta ornament in architecture there are limitations, for where such can be employed with good effect in private residences and certain classes of public buildings, there are other structures, such, for instance, as the "sky scrapers," now so much in vogue in our larger cities, in the construction of which iron is used extensively. These have become too large to permit of an extended ornamentation in relief work, since the projections would be too large and heavy. In such structures plenty of light is required and heavy cornice work would be in the way. Then, again, the large area of glass in the fronts reduce the available space for ornamentation, so that carved work must largely give way to low-relief or flat polychrome decoration. Color must be employed to embellish where sculpture cannot be resorted to.

In order to meet these requirements, the Mosaic Tile Company, of Zanesville, O., is producing a vitreous tiling which is finding great favor among architects for certain styles of buildings. The tile is especially designed for exterior decoration, its main characteristic being the inlaying of the Mosaic designs in colored clays, and these designs can be produced in any size and in any desired variety of coloring, to simulate a painting or fresco work, which is practically indestructible. The first

illustration shows a design in Mosaic tile work of the coat of arms of Louisiana, executed in fourteen different colors, for the floor of the United States Government Building at Baton Rouge.

This style of ornamentation is equally effective in larger structures, and we reproduce here the central figure design from the pediment in the Young Men's Christian Association Building at Warren, Pa., which is inlaid in several colors. The height of the figure shown is four feet.

The possibilities of Mosaic tiling for both interior and exterior decoration are limitless, and amongst its advantages are cleanliness (collecting no dust), durability (offering no relief parts to be knocked off) and economy (the cost being no greater than in fresco painting.)

Architectural terra cotta will continue to be used in certain styles of architecture, where there seems to be nothing to take its place, yet the time will, doubtless, soon come when it will stand for itself, instead of representing what it is not. Thus far it has been used to imitate stone work, and in many instances the very tool-marks of the carved stone are reproduced in it. How much more appropriate would it be if this product of the kiln were to stand on its own merits—should preserve its own distinguishing texture and color—instead of being made to simulate a more expensive material. Then would it command the respect of all lovers of art, where now it is looked upon, more or less, as a "makeshift" in the interest of economy. There are greater artistic possibilities in clay than in stone, and the sooner our manufacturers of architectural terra cotta awaken to this fact the better it will be for them, as well as for the public at large. Instead of endeavoring to deceive by closely imitating, both in color and texture, the work of the sculptor, let them produce an original material in clay which will boldly proclaim its honesty and will demonstrate to the world that the art of the modeler in clay is not second to that of the carver in stone.

But Mosaic tiling will also be used extensively in the near future, wherever heavy relief work may be incongruous, and it will rapidly grow in favor, for, after all, it is the revival of a long-slumbering art, and this is the age of art resurrection.

IMPROVEMENT IN THE FORM OF ROOFING TILES; patented in France by William-Arthur, Cameron-Waller; reported by *Moniteur de la Ceramique*, Dec. 1, 1896.

This new manner of making roofing tiles is designed to make a simpler, more convenient and a more solid jointing. To accomplish this the tile is provided with a number of projections on two sides, these projections being of a special form, which interlock with those of the adjoining tile when the two are fixed in place. Generally speaking, the tiles have the form of the lozenge, with corners raised. Upon the upper part of the tile there are three projecting facets, forming a fillet on the edge, which extends from the upper angle for a distance equal to one side, and two projections very near the side angles. On the lower part of the tile are three projections, which interlock with the projections of the upper section of the adjacent tile, the two thus being solidly fixed. To prevent the water from penetrating between the tiles, a sort of gutter in the form of a



HORIZONTAL PANEL. Enameled Iron Plate.

V (or any other convenient shape) is made in the projections. These little gutters, so to say, extend from one end of the tile to the other, so that the water that may accumulate is rapidly carried off, while this device prevents, also, the effect of capillary attraction.

Written for the CLAY-WORKER.

THE BRICKMAKER'S GRAVEYARD.—No. 3.

BY D. W. STOOKEY.

—Worn Out.—

CLAYWORKING MACHINES are not like "the wonderful one-hoss shay," for they never wear out, and he who places a machine in the graveyard and writes the inscription, "Worn Out," on its tombstone makes a grave mistake. In fact, he has buried it alive. Individual parts may and do wear out, but they may be replaced, and the machine will go on as well as ever. The old lady who knit new feet into her stockings every year and new legs every other year, and insisted that they were still the same stockings, entertained correct ideas as to the utility and efficiency of repairs. I know a machine that has been run every season for eighteen years, and does better service now than it did when it first left the shop. Probably every wheel, several shafts and a piece or two of the framework have been worn out or broken and renewed, and every grinder knife and feed auger many times, but it is still the same old machine, for it has never been replaced by a new

than the amount lost by having the machine running at reduced capacity while a full set of men is in attendance. A new feeding apparatus might give you satisfactory results and cost much less than a new machine of larger capacity.

—Died of Overwork.—

Some people seem to think that because a machine has a pug mill and die or molds for forming brick that no other apparatus for preparing clay is needed. They act as though they thought that the machine should make brick if it is given the raw materials in proper proportions. Just as reasonably we might expect to throw paper, ink and brains into a printing press and have it turn out newspapers. The ingredients must be properly prepared beforehand. When a machine is made with a pug mill attached, it is not to be taken as the guarantee of the maker that it will prepare clay for its own use. Pug mills, crushers, disintegrators and stone separators have their own fields of usefulness and must be required to do their intended work.

Thoroughly prepare the clay before forming it into its intended shape, is a rule that must be followed if good ware is to be made.

While it may not be profitable to expend much in the prep-



TYMPANUM, in Facade of New Gymnasium, Yale College.

one. The owner has so improved and increased the size of the augers that he has very materially increased the capacity of the machine, and by careful study is now enabled to obtain the greater output with considerably less power than was originally required. He starts and operates the machine with confidence, because he is familiar with every part and knows all of its tricks. He understands every symptom of disorder and knows the remedy. He knows just what it will do under certain conditions, and knows with what conditions he must surround it in order to produce certain desired results. Such are the benefits of keeping a machine with which you are familiar, and such are the reasons for being entirely familiar with the machine you are operating.

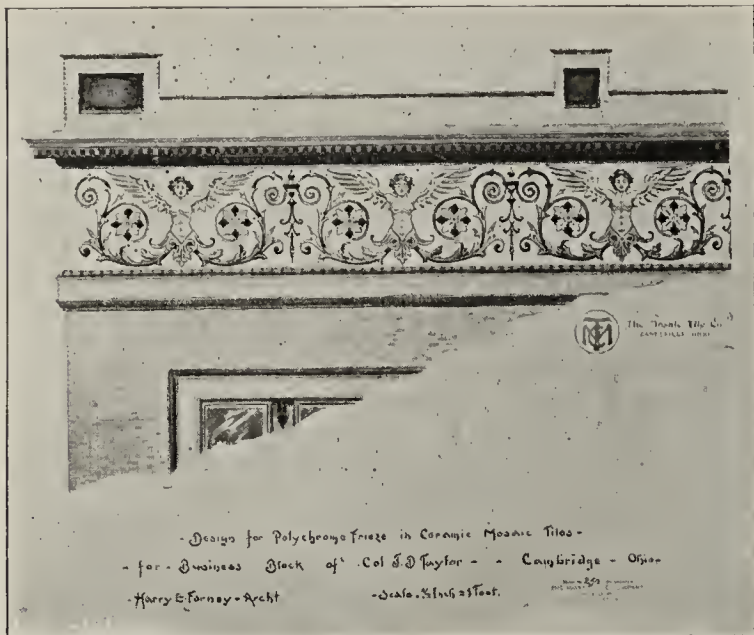
Do not condemn and remove an old machine because its capacity is not what it should be. Examine the feeding appliances. Probably they are badly worn and should be renewed. Investigate carefully and try to discover some way in which the feed may be increased. Do not grant that the maker of the machine had perfected it before he placed it upon the market. May be the shape of the feed could be improved or the size increased. A new set of feed augers costs much less

aration of the clay for brick, it yet remains true that the clay must be in good condition if good brick are to be made. Each manufacturer must decide for himself how much expense he can afford in the preparation of the clay. In this decision he will have to decide upon some compromise between quality and cost.

A machine with a pug mill or grinding department should not be condemned because it fails to make perfect ware of clay as it may happen to come from the bank. Crushers and disintegrators will do their intended work better and with much less power than it can be done in the pug mill of a brick machine. Many machines have been censured and condemned for doing imperfect work and consuming too much power, when more work was required of them than they were intended to perform and their condemnation was unjust. Yet they were hitched to powerful engines and compelled to grind hard, lumpy clay as best they could, and were driven under strains too great for them, until they gave out, not because of any fault of theirs, but because the brain power of the manager was not high enough to understand and remedy the evil.

—Died of Neglect.—

Machines have sometimes been thrown out because some one part wore out or got out of adjustment and the manager



failed to repair the part. I remember once seeing one of the most successful and widely used tile machines pulled up and replaced by another that I have every reason to believe was not as good, simply because one or two important bearings were badly worn, which injured the quality of the tile produced. Instead of having sense enough to make the needed repairs, at a small cost, and thus secure again one of the best machines on the market, the owner allowed an agent, who happened to get hold of him when his worn machine was working unsatisfactorily, to pull it out and sell him a new one of another design.

Any machine will wear and must be repaired at times. The machines that do fine work must be nicely adjusted and kept in order. The man who is not competent to adjust a machine and supply needed repairs is destined to meet imperfect work and unnecessary expenses that will soon destroy the business and deplete his finances. Instead of throwing out his old machine because it does not do as well as it did when new, he had better study it and learn wherein it is different from what it was when new. Knowing this, he will be able to restore the changed or worn parts, and thus make his machine like it was when first started. Having done this, he can reasonably expect it to give him as good service as it did then. He thus becomes master of the situation, and will know how



PEDIMENT, COAT OF ARMS OF U. S. See page 511.

to meet the difficulty when it occurs again. By thus studying his machine and becoming familiar with all its tricks, weaknesses and peculiarities, he makes himself master of it and is

in condition to exact from it the very best results possible. Should he hope to avoid its weaknesses by substituting a new machine he will soon discover, to his chagrin, that the new machine is like the first, in that it will wear and get out of adjustment. He then awakes to a realization of the disappointing fact that he is back to the condition which he sought to avoid when he bought the new machine. He now has the alternative of buying another one or meeting the problem of putting the old one in good repair again.

He who has charge of a machine must constantly know that it is in order. It is not enough to know that it was in good condition and worked satisfactorily when it was set up, nor that it was in adjustment when started in the morning. He must remember that it might get out of order at any time, and when it does or when it begins to change he should be ready and competent to correct the error. Unless such a man is in charge of the machinery, it cannot be operated so as to give the best results. The moment that the machinery gets out of repair the quality of the product is lowered or the quantity



DESIGN FROM Y. M. C. A. BUILDING, Warren, Pa. See page 511.

reduced; oftentimes both suffer. This reduces the efficiency of the plant just so much, and the same per cent. of diminution appears in the profits of the operators.

—Not Adapted to the Clay.—

It is very common to find machines consigned to the grave because they were not adapted to the clay. In these cases the men who sold the machines are at fault. They have done injury both to themselves and to the buyer. In their anxiety to book orders they have allowed their enterprise to outrun their judgment. They have done themselves harm by subjecting their machines to tests in which failure was a certainty. It is not a good policy to bring their machines into disrepute if they want to conduct a successful business in the future. A man who sells a machine to work a clay to which it is not adapted is not himself adapted to the work in which he is engaged. He has mistaken his calling; has failed to prepare himself for the work, or is unprincipled and dishonest. He is supposed to know what his machine will do. The buyer,

who has probably been too trusting, has relied upon the seller's judgment and assurances. A buyer of machinery should satisfy himself before he closes a bargain and makes the payments that he is getting what he wants.

The publication of testimonials as to the success of machines in certain locations has a tendency to lead intending purchasers to buy these particular machines. They lose sight of the fact, or possibly never knew, that a machine's success with one clay is no indication that it will succeed with another. If the clays are very much alike it is probable that the same machine would work both successfully, but it is not positive proof.

Even if both clays worked well in the same machine, it is possible and not altogether improbable that the new clay would not be well adapted to the process by which the first is being worked. The peculiar results developed in drying and burning the new clay might show that it was not well adapted to the same process as the other, although it worked well in the same machine. In short, the success of any machine in

The object in view in writing this was to call attention to failure and its causes with the hope that a knowledge of those things that lead to disappointment would assist in avoiding them. The brickmaker's happiness is largely drawn from his plant and home. If he is successful in his management of them he may be happy if he will.

FIRE BRICK AS THEY ARE MANUFACTURED IN THE COUNTIES OF DURHAM AND NORTHUMBERLAND, ENGLAND.

IN THIS PART of the country the clay lies under the coal and is extremely hard. There is in many of the mines a stratum, commonly called "post," which has about 90 per cent silicic. These clays, as they are taken from the mines, are dumped into two large piles. The oldest of these piles is used first, after it has been weathered with the winter frosts, the spring rains and summer suns. In large concerns it is not a common thing to weather the clay for twelve months. If these

clays were not weathered and were used as taken from the mine, the production would not be half as much, and there would be no comparison in the quality of the brick; and, besides, it would be very hard work for the molders to fill their molds, the clay being so hard it would not spread and fill the molds as freely as it ought to.

I have molded brick myself from unweathered clay when I had to take a clay knife, which is a steel blade about a half circle, with two handles, to cut the clay out. Such clay, if we used no knife, would wear our finger-nails off and make the fingers bleed.

The brick made from the weathered clay would be square with good corners and sharp edges, and would have a good ring to them when burned, while the unweathered clay would have broken corners, buff edges, sagged out of shape on account of the clay being so short, and would have a very poor sound when burned.

Weathering the clay is a great prevention to a large expense bill for repairs to machinery, such as scrapers, plates, tires, crown wheel and pinions; besides, the works have to be shut down two months in the year for repairs.

It also makes it much easier to pick the iron nuggets out that the miners sometimes dig too deep. The men filling the clay at the bank can see these nuggets on account of the rust caused by the water and exposure. The men that work at the bank are paid a certain sum in addition to their wages for picking out these iron particles.

THOS. PICKERING.

GERMAN NOTES.

NOTWITHSTANDING the fact that large quantities of brick and stoneware are used in the chemical industries of Germany, no definite standard method for determining the resisting power of such products to the action of acids has as yet been published. The method used in the laboratory of the Thonindustrie Zeitung seems to be a very practical one. The material to be tested is disintegrated into small grains and



MOSAIC TILE DESIGN IN FRONT OF MOERLEIN BUILDING, Cincinnati. (Design 42 x 25 feet, composed of 2000 six-inch tiles) Made by Mosaic Tile Co., Zanesville, Ohio. See page 511.

working one kind of clay is no assurance that its employment at another bank would be satisfactory.

The buying of clayworking machinery is as uncertain as marrying. There is constantly present the possibility that unforeseen traits will develop. In each case there is the possibility that these new and unexpected developments may be disappointments or pleasant surprises. Fortunately, wives possess a characteristic not inherent in machinery. They are endowed with a wonderful power of adaptability. They readily adjust themselves to their surroundings, if they do not succeed in adapting their surroundings to themselves. While a machine is rigid in its ways and unyielding, the wife is sensitive, pliant and disposed to yield.

As clayworkers have learned that success can only be gained by carefully studying the peculiarities of their clays, so husbands should know that the highest happiness can only be attained by knowing and respecting the individual characteristics of their wives.

Husbands and young clayworkers, please note. This is not as much of a digression as it may seem.

sieved through a 121 and 64 mesh sieve (121 and 64 mesh per square ene.), respectively; the grains left behind on the 121 sieve are used for the determination, and are washed with water, dried and treated with ten times the volume of acid for a certain length of time, the same for each test. The loss in weight, after repeated washing and drying, determines the acid resisting power. It is suggested to experiment with bodies of chemical stoneware in regard to determining what influence feldspar and flint, which are common ingredients of those bodies, exert upon the resisting quality.

THE HOUSE OF ERASMUS—REPRODUCTION OF AN ANCIENT BRICK STRUCTURE.

TRAVELERS IN ROTTERDAM who formerly were taken to the house where it was said Erasmus was born were surprised to see a common-place building of the eighteenth century. Messrs. Polak and Zonen, owners of this realty, and also of the adjacent buildings, were recently required to demolish it in order to enlarge their business premises. Now it transpires that this demolition, instead of being an act of vandalism, has proved, happily, a real benefit to archaeology.

The building demolished had no other merit than that it was erected in the last century upon the site of that in which Erasmus was born in 1467. But Messrs. Polak and Zonen have introduced into the wall of their new building a reproduction, as exactly as possible, of the front of the house of Erasmus on the site where it originally stood, a picture of which reproduction in brick appears herewith, taken from a recent issue of *L'Illustration*. The details of this reconstruction were supplied by Mr. Unger, a noted archaeologist of Rotterdam.

The facade is sloping, according to the style of the fifteenth century, and stands out in bold relief from the wall in which it is fixed. The window blinds are painted white and green, the armorial colors of the city. Upon an oaken panel, similar to that upon which the contemporaries of Erasmus himself had marked the house where, in their day, the pious and cosmopolitan scholar lived, has been painted his portrait. In a little niche is a miniature reproduction of his statue, which stands not far distant from this site, in the central market.

Wherefore Rotterdam may hereafter show to her visitors, without the fear of exhibiting an absurd anachronism, the real birthplace of Erasmus.



THE HOUSE OF ERASMUS.

Written for the Clay-Worker.

ALUMINUM IN CLAY.

THERE ARE CERTAIN far-reaching and popular fallacies that are very long-lived, and among them is the belief that the metal aluminium can be economically manufactured from clay. Almost daily some enthusiastic discoverer rushes into the laboratory with a lump of ordinary clay and whispers to the chemist that he is confidentially informed that this particular sample contains a large per cent. of aluminium. He is making arrangements for the immediate erection of a plant for the extraction of the metal by a special process, invented by Professor B., by which it is claimed pure aluminium can be produced at the remarkably low price of 10 cents a pound. He wants, meantime, a complete analysis of the sample, and is surprised at the calm way in which the chemist accepts so important a discovery. In the course of half an hour he is instructed—always free of charge—that all clays contain aluminium in greater or less amount, and that the name clay implies a mineral composed of silica and alumina combined as a silicate. He is told that all true clays, without exception, contain a large per cent. of this, to him, rare metal, and that this fact has been known to science for many a long year. At first he is sure that this cannot be true, since clay sells at so low a price, and only after considerable opposition to the new idea is he convinced that silicate of alumina, or clay, cannot be used for the production of the metal.

Though this fact is now beginning to be pretty widely known, the reason why clays cannot be so used is not generally understood.

Aluminium is a metal. Alumina is the oxide of this metal. In a true clay the aluminium exists not in the metallic state, but in combination with oxygen and with silica to form silicate of alumina, an insoluble compound. Pure kaolin, or white china clay, is composed of silicate of alumina, and so strong is the chemical combination that it is impossible to break it up by any process commercially profitable. We can extract the alumina by fusion with soda, solution in acid and subsequent precipitation, or by various other chemical methods, all too expensive, but there is no direct process for its extraction from the form of silicate. Therefore, though there is a considerable per cent. of alumina in all clays, ranging from 20 per cent. in ordinary fire clays to 40 per cent. in certain kaolins, since it exists in the form of insoluble silicate it is not available for the manufacture of the metal.

We must, then, look beyond the clays for some mineral containing the alumina in a soluble state or in some other form than the refractory silicate. This we find in the mineral bauxite, which contains often as much as 60 per cent. of alumina in the form of a hydrated oxide. This peculiar mineral, though much resembling clay in appearance, is a wholly different substance, showing, upon analysis, the following composition:

Water.....	29.00 per cent.
Alumina.....	60.00 per cent.
Silica.....	5.50 per cent.
Oxide of iron.....	1.00 per cent.
Titanic acid.....	4.50 per cent.

100.00 per cent.

The high alumina, the extraordinary amount of water and the low silica constitute a mineral differing wholly from clay, but the chief difference lies in the fact that the alumina is in a free state—not combined with silica—and therefore soluble and readily extracted by roasting with soda ash and lixiviating with water. Pure alumina is thus obtained, from which the metal is reduced by an electric bath.

Though bauxite is not a common mineral, and is at present confined to few localities, the deposits are large in Georgia, Alabama and Arkansas, and the price of the crude mineral less than \$6 a ton.

Silicate of alumina, as it occurs in clays, is a most refrac-

tory material and will stand a temperature of over 3,500 degrees Fahr. without softening. It is this that gives to the best fire clays their high melting point and makes them serviceable for glass pots and tank blocks. Impurities, such as oxide of iron, lime, magnesia and alkalies, render the clay more fusible, seeking to form with the silica and alumina a fusible glass which melts at lower temperatures. Hence the importance of knowing exactly what these impurities are before exposing a clay, or the bricks made from it, to a heat for which it was not intended.

The alumina, then, which exists in the clay in combination with silica, though it is of great importance as a resisting material in the furnace, is of no value as a source of the metal, and the sooner the fact is known to all, the less money will be foolishly blown away by the metallurgical adventurer.

W. M. CHAUVENET.

THE DISCOLORATIONS OF FRONT BRICK BY SOLUBLE SULPHATES AND THE WEATHERING OF CLAY.



UNDER THE ABOVE HEADING Mr. Hoernecke writes an interesting article in the *Thonindustrie Zeitung*. Most of the discolorations and efflorescences of brick burned under normal conditions are caused by soluble salts, sulphates, in the clay.

This fact is not generally appreciated, for usually the phenomenon of "whitewashing" is attributed to the influence of the sulphuric and sulphurous acids of the combustion gases in the kiln and drier upon damp or wet brick. Accordingly, various means have been used and suggested for preventing this great source of trouble to the brickmaker, with varied and often only apparent success. It is now pretty well known that the injurious salts contained in the clay are either soluble sulphates or insoluble sulphur compounds, like pyrites, which, under the influence of air and moisture, are changed to the soluble form. The more time elapses in the preparation of the clay and the more thoroughly it is worked, the more of the sulphur compounds are changed into soluble salts, which can be removed only by a thorough washing process. Likewise, the slower the drying of the ware is conducted the more of the soluble salts are dissolved in the body and are carried to the surface by the evaporating water. This explains why brick, during the slow drying periods of winter and spring, show the most efflorescence. Those surfaces and corners of the ware from which most water is evaporated, owing to a greater exposure to air currents or to roughness of surface, are whitewashed to the greatest degree.

The sulphur compounds may occur in all kinds of clays and sands. Usually they are distributed very irregularly. It often happens that in summer, when the clay is worked rapidly, no efflorescence appears, while in spring and winter it shows to an annoying extent.

At places where front brick and terra cotta are dipped into a slip (engobe) in order to obtain a uniform color the salts often show through this cover, and where they appear before the engobe is applied the seum prevents the latter from attaching itself to the body. This, of course, causes a peeling off of the slip after burning, unless the ware is burned to vitrification.

The efflorescence may be composed of other compounds than sulphates; for instance, those of vanadium, which give rise to greenish discolorations. The latter compounds cling to the brick most tenaciously, for even fire brick, after having been burned up to cone 14 or 16, were found to be covered with the greenish seum. In order to remove them the ware must be vitrified. Terra cotta, which undergoes a very thorough preparation and is dried slowly, is very liable to show efflorescence, due to the causes indicated above. The plaster molds may, perhaps, also contribute a share of the soluble salts.

In order to derive benefit from a chemical determination of the sulphates and other soluble salts, it is necessary to thoroughly sample the materials so as to include all the strata worked.

As far as weathering is concerned as a cause of efflorescence, the writer found by actual experience that a clay containing considerable quantities of sulphides and sulphates was rendered unfit for the manufacture of front brick by weathering, and he was compelled to store the clays for winter use in well-covered sheds, and even then the results were not satisfactory, while during the summer, when the clay was worked direct from the bank, no efflorescence was formed. He also

aimed to work the clay, which ordinarily had to be run through a pug mill four times, as little as possible in the plastic condition, and hence the clay was dried, pulverized in a disintegrator, sieved and tempered by passing once through a pug mill. But even with all the possible precautions, the brick made in spring and winter were more or less whitewashed.

In the assumption that the air was the chief agency in oxidizing the sulphides to sulphates, Mr. Hoernecke took some clay from the bank, passed it through the disintegrator and stored it, tightly packed, in a cellar. But even under these conditions sulphates were produced in a few months' storing, showing that moisture alone was sufficient to produce the change.

The writer also made extensive experiments with dry pressed brick, and found that by dry pressing he could always produce brick free from efflorescence out of material containing sulphides and soluble salts. He also experimented on trying to remove the soluble sulphates formed by a thorough weathering process, by providing for drainage and letting the rain accomplish the solution and removal of the salts. In this he succeeded, but the process was too slow to be of any practical value, owing to the toughness of the clay. Loose, sandy material might, perhaps, be treated successfully in this manner.



F. H. S. MORRISON, Sales Manager Powhatan Clay Mfg. Co.,
Richmond, Va.

Various means are employed for preventing whitewash. In the manufacture of terra cotta the ornamental surfaces are often covered with paper, which, of course, causes but little evaporation to take place at those parts; this means that only small quantities of salts are liable to be brought to the surface. The writer covered the surface of terra cotta with a layer of fine sand. The consequence was that the salts brought out by the evaporating water were left in the sand, which was brushed off afterwards.

The chemical means of preventing efflorescence are the carbonates and chloride of barium. The latter is cheaper, but if an excess of it is added it may cause efflorescence itself on account of its solubility. Barium carbonate, however, is a sure cure for whitewash, and has never been known to fail. Summing up, the writer says:

"Many discolorations of front brick are due to the sulphur compounds contained in the raw material. Sure means of preventing efflorescence are dry pressing and the use of barium carbonate. Fast drying lessens the danger of discoloring. Weathering of the raw material increases the tendency to efflorescence, but non-weathering does not entirely prevent it. Often it is advisable to obtain the advantages of weathering in regard to the structure of the clay and to prevent efflorescences by the methods suggested above."

Written for the CLAY-WORKER.

WAY DOWN IN MAINE.

BY B. J. DUNN.



IT IS AN OPINION, rarely expressed, but pretty generally entertained, that a close connection with the brick manufacturing industry is not conducive to a long career for a business firm. This opinion, no more beautiful, but a little more emphatically pretty general, is more often expressed in the Northeast than anywhere else, perhaps. The Northeast is more emphatic upon opinions of historic import than most sections of the Union, for New England lays claim to being the birthplace of the brickmaking of the Union, as it was of the Union. New England is not at all modest sometimes, particularly when it comes to quoting history and laying claim to foundation stones of commercial and social structures, and New England speaks generally as a privileged character upon all such subjects. And now New England puts forward its claim to possessing the oldest brickmaking firm in

in Bangor in 1824, when John Hellier assumed sole management of the firm. The yard then was situated where the buildings of the Bangor gas manufacturing plant now stand. This was close to Main street, the principal business thoroughfare of the city, and the city has grown in and over and far about the place where the tread stood and the little kilns grew and disappeared. The yard burrowed further and further into the hill, growing more vigorous with each succeeding year, and receding slowly from the approaching buildings. It is now located in a ten-acre field at the junction of Fourth and Warren streets, and some of the most comfortable residences in the city surround it upon all sides.

The present proprietor is Walter S. Hellier, the son and successor of John. He is one of the most pleasing types of the practical brick manufacturer, a man of about sixty years of age, whose life has been passed in looking after an extensive business, in which wonderfully rapid changing conditions required the watchfulness of an Argus and the foresight of a statesman. Mr. Hellier assumed charge of the concern in 1857, and it is since that time that the most remarkable changes have come about in the brickmaking industry throughout the country, and it is a compliment to him which needs no finger



GENERAL VIEW BANGOR BRICK WORKS, Bangor, Me.

the Union—that is, the firm with the longest continuous record in brick manufacturing—and that concern is located, of all places in the world, in the northernmost point of Uncle Sam's domain, in the center of Maine, where the wild Penobscot dashes and hears no sound save the song of the sawmill and the river drivers, chanting their latest ditties from the winter's musicales around the deacon seats of Aroostook logging camps. It is the only brickyard in the city of Bangor, and has enjoyed the blessing of being the only brickyard in a thriving city, along with the glory of being run by father and son continuously since almost the first brick house was built at the head of the tide; and more than this—now let your Western machine makers and inventors mark well and file exceptions, if they dare—it claims to be the first brickyard in which a dry press brick machine was tried and worked with any sort of success.

It is known to-day as the Bangor Brick Works, and it was known by that name nearly a century ago, when John Hellier and James Hellier, two sons of a sturdy English brickmaking father, set up their first kiln and offered their wares for sale in competition with the material of the lumber kings of the Penobscot and the Kennebec. There were not many buildings

mark to emphasize that he has managed to keep in the van with all the improvements and inventions of the time. There didn't seem to be much of worry or anxiety in Mr. Hellier's tone as he sat in his comfortable office in sight of the yard, and talked with the writer of the past and of the future. It is a remarkable fact that while throughout the Union, with few exceptions, the brick manufacturers, in referring to the season of 1896, speak of it as a season of loss and disappointment, Mr. Hellier regards it as one of the most successful for many years. It was all the more pleasingly successful from the fact that the cry of hard times and the wail of distress had long been heard in Bangor, and yet of the 3,000,000 bricks manufactured, 2,500,000 went at profitable prices before fall, leaving but 500,000 to supply the demand this spring. These are now nearly gone, and the crews were sent to work Monday, April 26, making ready to start the three Martin machines as soon as possible, in order to keep pace with a demand which is surprising the Manager.

The history of brickmaking in Maine is epitomized in this plant. We made a careful but fruitless search to discover the date when John Hellier went to Portland to look at the first brick machine known in this section. It was what is known

as the Hobbs, a soft mud machine, still very common in Eastern yards. The horse grinds the mud into a press box, and the mold is filled by a foot treadle operating a plunger in this press box or trunk. That was the end of hand molding in this vicinity. The Hobbs did its work well and increased the output. Mr. Hellier operated several Hobbs machines for years. The first attempt to improve upon that process was made about forty-five years ago, and a Bangor machinist was the inventor. Was he the first? His name was Bartlett. He was employed in the machine shop of the Muzzy Iron Works, in Bangor, and was sometimes called in to repair machinery at Hellier's yard. He went to work upon a scheme to press bricks without the bothersome soaking and pugging. He contrived a crusher and a plunger, which fed into dies in a revolving table. The machine made good bricks, but it stirred up trouble in the crew. It worked the men too hard while it was in operation. At the end of a fortnight the machine's digestive organism was hopelessly destroyed by a feed of hard stones, carefully and surreptitiously administered.

The dastardly deed discouraged the inventor and the proprietor, and a new scheme soon displaced the brick machine in Mr. Bartlett's mind. He invented some sort of arrangement for floating sunken wrecks. It proved successful in many undertakings, and Bartlett, in company with others, went to the

The demand is almost wholly for common bricks, and is confined to the city. It is nearly ten years since the Bangor Brick Works shipped a considerable cargo of brick. At one time the output of this yard was much sought for in the Boston market, and for years the Eastern provinces and St. Johns, N. F., took as high as several millions a year. There were also many shipments to the South, and the West Indies were good customers. Ten years ago Mr. Hellier sent his last cargo—a 300,000 lot—to St. Thomas, Mart. Since then New York and other yards have ruined the field.

Not the least remarkable thing about this remarkable concern is the manner in which its employes remain with it. There are several men who have worked for the Bangor Brick Company for more than forty years consecutively; several others have worked there for from thirty to forty years, and Mr. Hellier counted no less than a dozen from his books who have been with him for twenty years or close to it. The secret is in the fact that Mr. Hellier regards his men as a family. His watchfulness never takes the form of spying, and his reprimand is the more impressive because of its kindness. His men love him, and there is a loyalty to each other that is wonderful. Drunkenness is unknown, and very little bickering is ever noticed.

The roll of honor of the Bangor Brick Works is as follows:



WORKS AND WORKMEN BANGOR (Me.) BRICK CO.

Black sea to raise the hulks of the Russian fleet sunk there in the Russo-Turkish war. He was reasonably successful, but in a great storm his outfit, with every man, including himself, were sunk.

Fragments of his first brick machine were in the Muzzy Iron Works up to within a few years ago, but they have since disappeared. The bricks made by this first dry press machine were laid in the chimneys of some houses belonging to the Bangor Brick Works, and last week Mr. Hellier sent a mason to repair some looseness in the chimney tops. The mason found these bricks and inquired their origin. Mr. Hellier remembered, and two of them are now in his office. They are very creditable samples after more than forty years in the exposed position of a chimney top in a rigorous climate such as Maine's.

The present Mr. Hellier was the first to add machinery which displaced the Hobbs machines. For a long time the builders objected to sand struck brick, and once, to please those who would insist upon having the old soft mud brick, two Hobbs machines were worked. It took about a year to satisfy the sticklers for the old style that sand struck bricks were preferable.

William Connell, Patrick Milan and John Mooney, forty years' continuous service and still at work. Others of long continued service are: Patrick Leonard, John Albert, Turner Hanson, H. F. Stoddard, Barney McQuaid, Patrick McRae and William Blake.

Mr. Hellier was always a union advocate. He has been intelligent enough to see the ruinous effect of the policy pursued by the brickmakers here, and often appealed for a better understanding among local manufacturers. His advice being fruitless, he did the next thing possible: he maintained his prices, so far as he could, at a living profit. He is respected universally for fair dealing.

REPRESENTATIONS TO SUBSCRIBERS TO STOCK COMPANY.—Statements made to a party by one who procured his subscription to a fund for the erection of a factory that the profits would be large are matters of opinion only, and, even if false, do not constitute a defense to an action to enforce payment of the subscription. (Davis vs. Campbell, Supreme Ct. Iowa, 61 N. W. Reporter, 1053.)

Written for the CLAY-WORKER

SOMETHING ABOUT SEWER PIPE.

ANTON VOGT.

THIS ARTICLE IS DESIGNED to convey to readers of the Clay-Worker, particularly to those who have never visited a modern sewer pipe factory, some knowledge of this branch of the business. The best material for the manufacture of sewer pipe is a mixture of clays. The mixtures are, or should be for best results: Silica, 60 per cent.; alumina, 15 per cent.; oxide of iron, 8 per cent.; lime, 2 per cent.; magnesia, 3 per cent.; potash and soda, 6 per cent., and neutral impurities, organic matter, etc., 6 per cent. Clay, in these proportions, will make first-class sewer pipe. Of course, more or less of one or the other of these elements will give good results by the use of good judgment. If too much alumina is present in the clay the pipes will crack while drying. Silica acts as the best corrective for this defect. The more silica there is present in the clay the less is the shrinkage and the more free is the clay from cracking. Both the silicate of alumina and silica are practically infusible, and possess the greatest refractory power when pure. The less amount of other ingredients found in a clay the higher is its refractive power.

—The Influence of Iron.—

Some so-called experts have claimed that the existence of iron in the clay is injurious to it for pipemaking, in that the iron is sometimes consumed entirely by the intense heat necessary to vitrification, leaving small holes in the body of the finished pipe, but my experience of fifteen years justifies me in asserting, without fear of successful contradiction, that a small proportion of iron, thoroughly ground and distributed throughout the mixture of clays, is, when the pipe is properly burned, not only a great advantage, but positively necessary to produce the best results, for the iron, properly mixed, adds materially to the toughness and strength of the pipe, while pipe made of clay entirely free from iron is always brittle and easily chipped and broken in shipping.

—The Influence of Lime and Magnesia.—

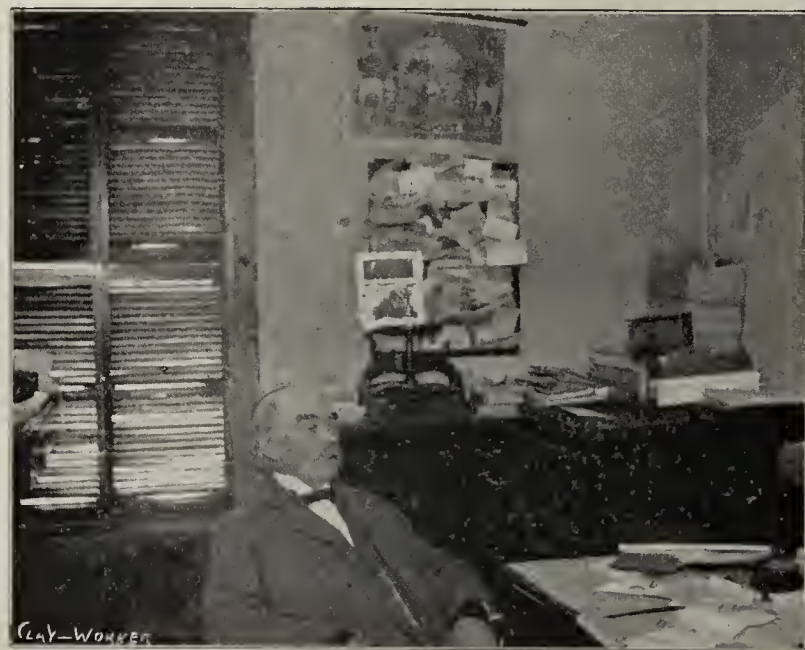
Lime and magnesia, if existing in a finely divided and thoroughly disseminated condition, act as a flux at high temperature. They have also the peculiar property of uniting with the iron. If lime occurs in lumps, the clay must, with the lumps, be ground fine. The lime cannot, in coarse condition, unite with the other ingredients of the clay, except on its outer surface, and hence burns into caustic lime, and on acquiring moisture expands and often bursts the material of which it forms a part. The presence of lime and magnesia in a pipe in reasonable quantities is not detrimental to the pipe, if it exists in a finely divided state.

—The Fluxing Power of Various Ingredients—Potash and Soda, Etc.—

The most powerful fluxing agencies common to clay are potash and soda. They fuse at a lower temperature and unite more readily with silica than iron, lime or magnesia. In a general way, it is found that, to vitrify, a clay should contain at least 3 per cent. of potash, 3 per cent. of soda, or 5 per cent. of lime and magnesia, or 8 per cent. of iron, or a combined proportion of any or all of these fluxes equal to these amounts. An appreciably less amount of these fluxing elements will leave the material more of the nature of fire clay. It is a mistaken idea that fire clay alone will make good pipe. Fire clay proper will not vitrify. The body of the finished pipe will be porous and will not take a good salt glaze. A greater proportion of potash and soda is desirable, and will make the clay more easily vitrified at a less heat, and is, to some extent, a measure of its economic manufacture, as a lower heat, and consequently less fuel, will be required for burning. Too great an amount of these fluxes, amounting, perhaps, to three times the quantities above mentioned, will render the clay hard to han-

dle on account of too great fusibility. Such clay will not stand up under fire, but melt, destroying the pipes. I pity the burner who has to handle such clay; it would be better for him had he never been born. It is a general rule with manufacturers that they blame the burner, when, by examination and analysis of their clay, they would find the real cause of the trouble in the clay bank.

The mixing of the clay is one of the most important of all the various steps in making sewer pipe. To thoroughly mix the clay a steam shovel should be used. Why? Because, by the use of these machines, a much better pipe can be made from the same material, beginning, as it does, at the bottom and working up the bank, mixing thoroughly the different strata of clay. I mean clay that contains about the same percentage of the different ingredients as before mentioned, which are absolutely necessary for best results. The Marion Steam Shovel Company manufacture a very good machine. (I saw one in operation in the clay bank of H. B. Camp, of Cuyahoga Falls, O., for whom I worked five years, burning sewer pipe and most any kind of clay products.) That machine gave entire satisfaction, and better pipes were made by using it than before, when the clay was blasted with powder. Mr. Camp now operates a large factory at Aultman, O., where he manu-



JOHN HELLIER, in his office at Bangor, Me. See page 518.

factures, in connection with sewer pipe, etc., electric conduits (his own invention).

In some sections of the globe, I don't know whether in the United States or not, the clay does not need any mixing, as it is mixed already in proper proportion by nature's perfect work, and when you ask the proprietor of such a clay bank, he will answer: "The Lord mixed our clay for us ages ago, and has been holding it in reserve all these years for His chosen people, and we are making it into sewer pipe just as it comes from the bank, without adding anything to it or taking anything from it."

Manufacturers of sewer pipe experience great trouble to get the clay mixed in the proportion for best results. The proper place to mix clay is in the clay bank, and not in the clay house, and a sewer pipe manufacturer should make it his duty to visit his clay bank the first thing in the morning (as Mr. H. B. Camp has done for years), and see that the clay is mixed properly. He should not keep a man in his employ who does not obey his orders. The man in charge of the clay bank should not presume to "know it all," when, in fact, he knows no more about clay than a cow knows of a nutmeg.

If I were a sewer pipe manufacturer I would hire a chemist to take charge of the clay bank and analyze the different veins of clay as they appear, and to give instructions how to

mix the clay. Great would be my reward. Clay is clay, they say. I do not believe it any more than that coal is coal. It takes the presence of different ingredients in the right proportion to produce a first-class article of both. A burner can't burn first-class pipes unless he has both—good coal and good clay. Nobody can. Even the late Professor Herrmann, the wizard, would not be able to do it, if he were alive. "Ce vrai ca," says the Frenchman.

As to the mixing of the clay in the factory or in the clay house, I will say this: that disaster will surely follow, unless the men who are to do the shoveling into the dry pan are strictly honest and reliable. I have seen men who were told by the manager to shovel two shovelfuls of one kind of clay and one shovelful of another clay into the dry or grinding pan. The men did just the reverse. Why? Because one pile of clay was some distance from the grinding pan and the other pile was near by and convenient to shovel. There was no visible difference in the pressed pipes, but they did not stand up under heat and were spoiled in burning, especially around the fire bags, where the heat was greatest. If such things happen and go on for some time, the burner becomes an old, gray-haired man before his time. It's no use for him to call the attention of the manufacturer to the trouble and the cause of it; no excuse; he had the kiln overburnt, notwithstanding the fact it was overburnt with a heat that would make good clay just about redhot!

Written for the CLAY-WORKER.

IN DEUTSCHLAND. No. 14.



IN THE LINE of the Berlin-Hamburg Railway, near Friedrichsruhe, the home of Bismarck, there is located a well-known clayworking establishment, the Friedrichsruhe Clay Works, which was visited by the Clay-Worker scribe. We found the factory situated amid a typical northern scenery, characterized by dense, fragrant pine forests, such as are loved by Germany's great statesman.

As usual, we were well received, and the factory was visited under the guidance of the superintendent. An imposing-looking establishment it was, its stacks extending high above the surrounding forests. The products are common and front brick and roofing tiles, manufactured out of a tough, marl-like clay, very difficult to work. The material is taken to the factory in dump cars, and is first stored in an extensive shed, in which there are two tracks bringing in clay, one on each side. Between the tracks, some six feet deep, there is a pit into which the clay is dumped, and where it is soaked. The pit running all along the shed, about a hundred feet long, holds a great quantity of clay. It also gives the material ample time to soak, for while one end is being filled clay is taken away from the other end. The removal of the clay is accomplished by means of a conveyor, running along the middle of the pit and flush with the floor, so that the work of shoveling the clay on to the conveyor involves no severe manual labor; in fact, a man with a hoe can keep one machine in clay very easily. The conveying arrangement is of a very interesting construction. It is made up of steel pans, with two hooks at each end, one on each side, which link into each other, like the links of a sprocket chain; in fact, it is virtually a link belt, in which the pans represent the links. The sheaves at each end of the line are hexagonal. At frequent intervals idlers are arranged, which take the weight of the conveyor. This apparatus is claimed to be a very satisfactory one in every respect.

From the soaking pit the clay is taken to a three-foot roller crusher, from which it goes to the pug mills and brick machines. Two vertical auger machines and a horizontal one are in operation, a machine for each department; one, the horizontal, making front brick, another one common brick and the third

one turning out roofing tiles. The front-brick tiles, as usual, are not repressed, but in order to give them a cleaner edge than is ordinarily obtained with one cut, the cutting is done by two wires; the first one does the cutting proper, being immediately followed by the second one, which simply recuts the brick, thus removing the rough edges to some extent.

The roofing tiles are of the interlocking type, with longitudinal joints only, and leave the auger machine complete, so far as shape is concerned. In order to secure as much lightness as possible, and to reduce the tendency to warp, the tiles are made hollow, the hollow space being one-quarter of an inch wide and divided by several partitions. That important part of a German roofing tile, the "nib," by means of which the tile is hung on to the laths of the roof, is likewise affixed in the one operation, the details of which take place as follows: From the die of the stiff-mud machine, corresponding to the cross-section of the tile, with the two joints and a center rib from which the nib is to be cut, the stream issues on to the cutting table and is cut into the required lengths. At the same time the rib at the middle of the tile is removed, leaving only a short piece at the one end; this makes the "nose." The tiles are now taken up by the operatives, who seal them up at one end. After this has been done they are trimmed with a knife and sponged. At the end which is sealed up a number of small holes are left, about six, a simple but very important precaution, for by this means any



THE FRIEDRICHSRUHE CLAY WORKS. North side.

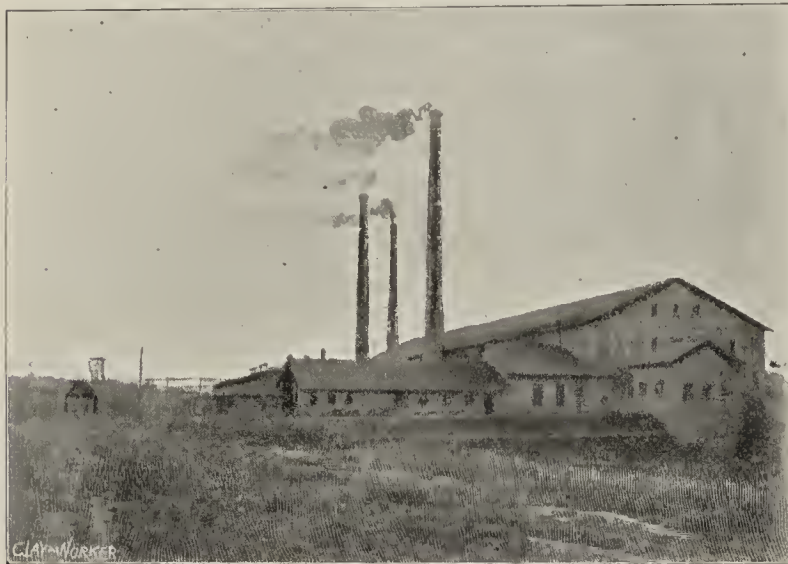
water which might collect on the inside of the tile can escape, otherwise the freezing water would injure or break it. A cutting table is being sold now which partially closes up both ends in connection with the cutting operation, thus saving the extra labor required for this part of the operation. Beside the decreased tendency of warping claimed for the hollow tile, there is another advantage derived from it, better interlocking joints, owing to the fact that they can be made deeper than it is possible to do in the ordinary solid tile. The finished tiles are taken to the drying room by a fine conveying belt, fully 360 feet long, running down the center aisle of the drier, which is equipped with the ordinary racks.

The burning is done in two continuous kilns, a large one of fifty chambers, each holding 7,000 brick, German size, and a smaller one, in which the chambers are built zig-zag fashion. The latter kiln is an awe-inspiring burning appliance, with chambers dark as midnight and full of corners where the writer, to his sorrow, did not expect to find any. The surprising part of it is that this kiln was ever built.

All the roofing tiles are glazed with a transparent lead-glaze, through which the body shows in its natural color, a very nice red. The glaze, however, is applied onto the burnt tiles, which are then again burned in small glaze-kilns, ordinary down-draft kilns, holding about 3,000 tiles each, and being built together in a row. There are twelve of these, and it takes twelve hours to make a glaze-burn.

In connection with glazing, the question arises as to the difference between glazing the green and the burned body. At this concern preference is given to the latter process, while at the majority of factories visited by the writer the former is applied. A number of advantages are claimed for either, and it will perhaps not be amiss to cite them for each side.

For the glazing of already burned ware it is claimed that less glaze is required, that the burned body takes the glaze better; that it is much easier to produce faultless glazes, with



THE FRIEDRICHSRUHE CLAY WORKS End view.

but little danger of failure, and that, finally, a more even color and a better gloss is obtained. This is disputed by the makers who glaze their tiles in the green condition. Their points are, less cost of manufacture, a more even layer of glaze, less glaze used and a better adhesion to the body. In considering the advantages claimed for both methods, it seems as if the glazing of the green ware was the better one. This is also borne out by the fact that in the majority of cases it is the process in use.

The Friedrichsrue Clay Works, at present, are under the management of an energetic superintendent, whose efforts are directed towards the introduction of all modern improvements. The works show the systematizing, painstaking and orderly spirit so peculiar to most of the German brick plants.

—The Mendheim Kiln, with Semi-Gas Firing and Heat Regenerator.—

Mr. George Mendheim, whose gas-fired continuous kiln has been described in a preceding paper, has constructed a kiln which deserves the attention of American clayworkers, inasmuch as it is a down-draft kiln, in which it is endeavored to economize the fuel as much as it is possible to do in a periodic kiln. In the ordinary down-draft kiln, unlike the continuous kiln, the air for combustion is admitted cold, and the combustion gases, after escaping through the floor, carry off heat which is lost to all practical intents and purposes. This waste heat Mendheim utilizes to some extent by transferring it to the air used for combustion during the hotter stages of the burn. This he accomplishes by means of a comparatively simple arrangement, as shown by the cuts. The kiln represented is a small, square down-draft kiln, with four fire-boxes—*k*—which communicate with the bags; *l*, the fire-gases escaping through the holes; *m*, in the floor, into the main flue. Now, the gases in this part of the kiln strike an obstruction, which extends throughout the flue—a system of small flues built up tightly by means of shape brick and tiles, in zig-zag fashion. This flue system, of course, absorbs a considerable portion of the heat coming through the floor, and it is the object of this arrangement to impart this heat to cold air coming in from the outside, the hot air produced to be used for combustion. The bundle of flues, or heat regenerator, as it may be called, is nowhere open to the combustion gases, so that there is no chance for the air to become contaminated with the gases, nor for its leak-

ago into the main flue. The heated air rises through a flue—*l*—into the bag, where it mixes with the fuel gas. But let us now follow the burning process. During the watersmoking period firing proceeds as in any ordinary down-draft kiln; the difference comes in as soon as the kiln is getting hot. It will be observed that the fire-box is quite deep, with slightly inclined grate-bars, and is constructed like a small gas producer, which, in fact, it is. Two fire holes are provided, one at the side and one on top. As soon as the heat has been raised high enough, to a slight red heat, enough fuel is charged through the top fire-hole to cover the fire completely, in order to stop the evolution of flame, and gas is now given off. At the same time the flue *f* is opened, permitting the air to flow into the heater or regenerator, where it is heated and from which the now hot air ascends to the bag. Here it meets the combustible gases coming from the furnace, which are prevented from burning only by lack of sufficient oxygen. This is supplied by the air, which intermingles with the gas, and combustion takes place. The flow of air is easily regulated so as to produce oxidizing and reducing conditions in the kiln at will, the former by admitting plenty of air; the latter by cutting down the supply below the required amount.

It is important that the furnaces be built large enough to hold sufficient fuel to finish the burn, with little or no raking of the grates. This gives another advantage over the ordinary way by avoiding the loss of heat which always accompanies the frequent cleaning and raking of the grate-bars. Thus the advantages claimed for the Mendheim regenerating furnace are:

(1) Saving of fuel, and better combustion by the use of heated air.

(2) Better regulation of firing conditions during the important period of the burn.

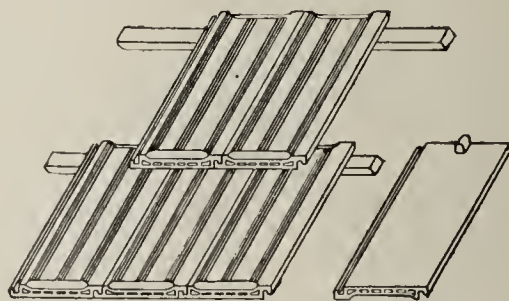
(3) Avoiding the frequent cleaning and raking of the fires.

The advantages of the regenerating apparatus become the more marked the higher the required temperature of the kiln, as for refractory ware, paving brick, etc. The construction of the same does not entail much expense, and it may be installed in small as well as large kilns.

For the cuts we are indebted to the courtesy of Mr. Mendheim.

—The German Stoneware Industry.—

In previous papers some space was devoted, first to the earthenware industry, representing the lowest grade of pottery; second, to the stone tile manufacture, which is, to some extent, a branch of pottery, but one requiring a greater technical skill than the former; and now some brief consideration will be given to the stoneware industry. Here the writer will endeavor to point out the lines along which it would be profitable



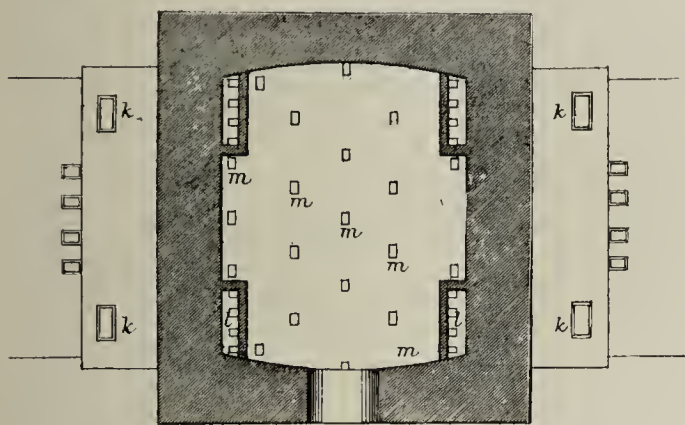
Hollow Interlocking Roofing Tiles with Longitudinal Joints.

for the American stoneware potters to follow the German craft.

We all are acquainted with the characteristics of stoneware, its dense body due to incipient or partial vitrification, its gray color and its universal salt or slip glaze. Specimens of common German stoneware are quite frequently met in the United States, appearing in the shape of mineral water bottles, jugs, ink bottles, etc. More of it is seen in large chemical laboratories and manufactories, where we find stoneware condensing pots and worms, pipes, holders, syphons, etc., most of them "made in Germany." Sometimes a piece of German ornamental stoneware is met with, usually decorated with hard-fire colors,

in a quiet, unassuming style; it may perhaps be a vase or a beer mug. The writer is obliged to state that his personal observations, especially among the chemical stoneware factories, have not been very extensive, owing to the fact that the manufacturers of this class of ware are averse to admitting strangers into their establishments.

One of the German stoneware centers is to be found near Coblenz, a district in which this branch of pottery has been carried on for centuries. The foundation of the industry is a



Mendheim Down-Draft Kiln with Semi-Gas Firing System and Heat Regenerator. Ground plan.

most excellent clay, combining all the qualities of a good stoneware clay, plasticity, high contents of silica and refractory power, modified by contents of alkali averaging about 2½ per cent., which permits the clay to vitrify to a hard, dense body of a gray color, if burned under oxydizing conditions—brown, if reducing conditions prevail during the burn. The clay is mined in rather a crude fashion, somewhat similar to the mining of kaolin at Gruenstadt, made mention of in a previous paper, a vertical shaft twelve or fifteen feet deep being sunk down to the stratum of the clay, which is then dug as far as it is convenient to reach. The material is raised to the surface in buckets. As soon as the hole is thus superficially stripped of its clay it is abandoned and another shaft is sunk. However, some mining is being done now under the direction of mining experts in a more systematic and more profitable manner.

In the villages comprising the stoneware district, pottery is the principal occupation, and the staple articles are the ordinary stoneware pottery, stoneware sewer pipes, chemical utensils, artificial whetstones and tobacco-pipes. Surprising as it may seem, the bulk of the manufacture of pottery is carried on by master potters, each having one or several journeymen, so that potteries are found scattered through the villages. The manufacture of sewer pipe and chemical appliances is generally conducted in factories. Nature has provided for this region a clay so homogeneous in its structure that it almost seems to be in a condition ready for use. For this reason its preparation is very simple, it being soaked and tempered in vertical pug mills, from which the clay comes ready to be molded into the different products. In the manufacture of pottery the ware is usually hand-turned in the smaller shops, while the factories, being supplied with machinery, employ the jolly method (turning the ware in plaster molds), in which cheaper labor can be used, to some extent. In the former such great dexterity is shown by the workmen that really the difference in cost between turned and jollied ware is not very great. This is due to the fact that each man has one or two shapes which he turns throughout the year. The wheels are generally worked by hand, except, of course, in the factories. Owing to its density and hardness, stoneware is not suitable for uses where it is subjected to sudden changes of temperature; hence for cooking ware grog is added to the clay in order to make the body more porous. Of late years a line of decorated stoneware pottery has been developed in which the artistic possibilities of stoneware are brought out prominently, including vases, mugs, bric-a-brac, etc., in which the background is executed in blue, with

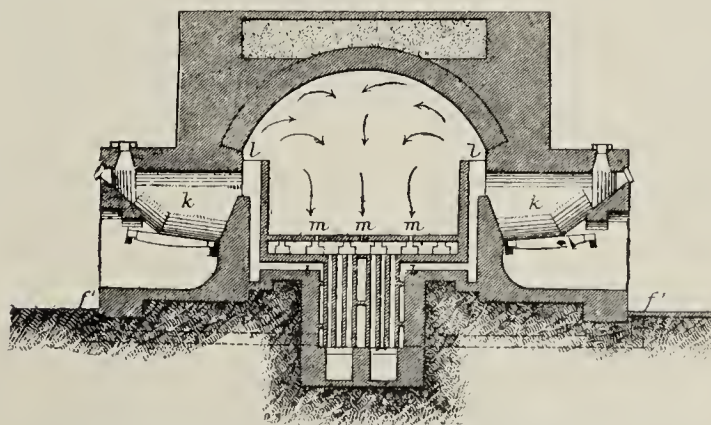
relief ornamentations maintaining the pearly gray of the salt-glazed body. Various other decorations are on the market, such as unique designs traced in the manner of pen-drawings by scratching the lines with a pointed tool and filling out the spaces between them with colored slip, usually a blue one. Some of the stoneware is glazed with an opaque white glaze, similar to our Bristol glazes, which covers the gray of the body. The color decorations are then applied like on white ware. But, by thus covering the stoneware color, the typical character of this kind of ware is lost.

The chemical stoneware, in its many shapes, is, in part, turned on the wheel, in part pressed in molds, depending, of course, upon the size and construction of the pieces. For instance, acid carboys, which are sphere-like in shape, with a short neck, are turned in halves, which are then united and thoroughly welded together, while the neck is likewise made as a separate piece. In manufacturing the different kinds of retorts, pans, worms, etc., very careful work is required, for the slightest crack may render the entire piece unfit for use, also the inventive genius of the maker is taxed in the fitting of the complicated pieces.

Little need be said in regard to the manufacture of stoneware sewer pipe. The ware is most carefully made, the traps, basins, branches, etc., being almost perfect in shape, but the machinery used in the making of the straight pipes is inferior to the American as far as capacity is concerned. The presses are always vertical ones, direct steam presses, however, being found only in the largest establishments. Most of the presses are worked by transmitted power, and the clay may be forced through the die either by an auger, a pair of strong rolls or a piston. In the latter case power is applied by hydraulic pressure or by a power screw. In neither one of the types does the capacity approach that of modern American sewer-pipe presses.

All the different kinds of stoneware made mention of are, as a rule, burned in either horizontal or down-draft kilns, the latter being the more satisfactory. The process of salt-glazing, which is too well known to need description, is part of each burn, it being executed during the last stage. A few of the more prosperous firms are operating continuous kilns, but the smaller concerns are compelled to retain the small, awkwardly-built horizontal draft kilns, with their attendant large consumption of fuel and uneven burns. The stoneware region, indeed, presents a strong contrast to the other branches of the German clay industry, where the use of the continuous kiln has reached its highest development.

It will appear from the above that there are two lines of



Kiln and Regenerator of the Semi-Gas Firing System. Section.

the German stoneware industry, which it would be worth while for our stoneware potters to follow—first, the manufacture of chemical stoneware, which is yet in its infancy in this country, but which is an important factor in the development of the American chemical industries; second, the production of ornamental as well as useful wares, such as vases, mugs, ice-coolers, filters and various other articles.

Written for the CLAY-WORKER.

THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.

BY E. G. DURANT.



UNDER OUR FIRST PROPOSITION we have discussed only the strength of blocks, but this proposition included also "protection against weather conditions." Let us now inquire how hollow construction will compare with solid in this regard.

The great majority of block walls that have been constructed, to date, have been single course, the exceptions being heavy factory structures.

Our observation leads us to say that these single-course walls have been largely of blocks $8\frac{1}{4} \times 8\frac{1}{4} \times 16\frac{1}{2}$ inches in size, with walls approximating one inch in thickness, as shown in Sketch 1. These are the blocks made and most largely used in eastern Ohio and western Pennsylvania, Canton, O., being the center of production.

At Brazil, Ind., a block of the same size, but with a web, as shown in Sketch 2, has been the favorite. The walls of this block are but $\frac{3}{4}$ inch thick, instead of 1 inch, and they weigh perhaps 6 per cent. more than the Ohio blocks.

It is apparent that the mortar joints must be very perfect

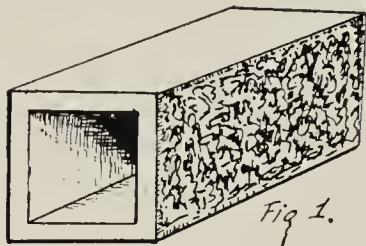


Fig. 1.

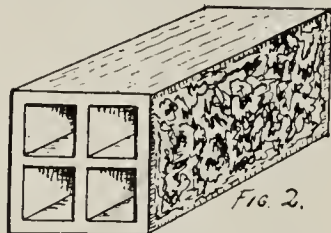


Fig. 2.

in either of these blocks, to be entirely safe against weather conditions, when plastering is laid directly upon the inner face of the walls formed of them. So far as we have been able to ascertain, however, the block has been much more satisfactory as a weather protection against either dampness or cold than an 8-inch brick wall similarly treated.

These blocks may be taken as representing the minimum of security afforded by hollow block construction, while yet pronounced superior to an equal thickness of brick wall treated in the same way.

—A Long Step in Advance—

Has been taken in the introduction of a "lap joint," as shown in Sketch 3. The blocks are provided with longitudinal inner ribs, about one-quarter of an inch in cross section area, located about three-fourths of an inch from the inner face of the front wall of the block. A joint piece—also shown in Sketch 3—receives mortar on its face, and, being inserted in the end of a laid block, it also is made to enter the next block as it is laid, and that block, being forced to its position, in the process, by means of the inner ribs of the block acting upon the beveled

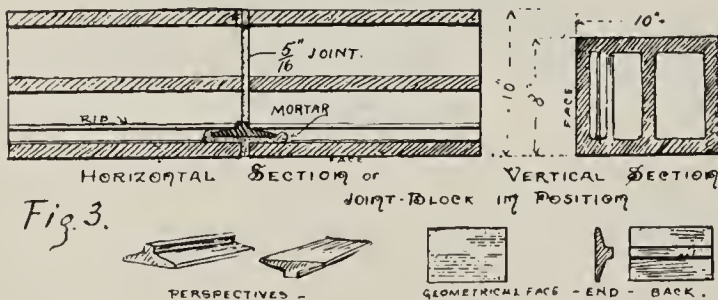


Fig. 3.

surfaces of the joint strip, it is forced towards the wall of the block, and a compressed mortar joint, as shown in the horizontal cross section of two blocks, is the result. A mortar joint of four inches is thus made to take the place of a joint of a

single inch, or less, in width. The joint pieces are readily made in such quantity as to add very slightly to cost, considering the result attained. We give in Sketch 4 an end view of



Fig. 4.

a block, two streams of which issue from a die at a time; every six inches or less of the streams make eight joint pieces. The blocks are scored at

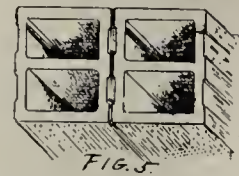


Fig. 5.

the corners in passing from the machine, and, after burning, a gentle tap causes them to divide into the required single pieces.

There still remains another step which, taken, adds to the

—Perfection of Protection—

Sought, and which, while not adding to the cost of the blocks, is deemed, from several points of view, to have special value. This feature is illustrated in Sketch 5, which is an end view of two blocks laid. It will be seen that the top and bottom of these blocks are slightly chambered, leaving at each edge of the block a rib two and one-quarter inches in width by about one-eighth of an inch in height. On these ribs the mortar may be laid, and, as the blocks are seated, the mortar will be compressed inwardly, as shown, forming a key, and at the same time leaving a chamber in the joint about one-half by four inches. The points secured by this simple device are several and each important.

First. The continuity of the mortar joint is broken, and hence it cannot carry dampness through the wall, and saves the possibility of the discoloration of any interior wall finish.

Second. The top or bottom of a block may sometimes be found rounded outwardly, and, in laying, two results may follow—first, the necessity for a thicker joint, destroying uniformity in thickness of joints; and, second, throwing the weight of the wall upon the horizontal instead of the vertical walls of the block. Besides this, the small amount of mortar required will encourage the use of a better character of mortar, which we take the opportunity of saying should, in block-laying, be made of hydraulic cement and lime in equal quantity. As not over one-sixth the mortar is required which would enter into the

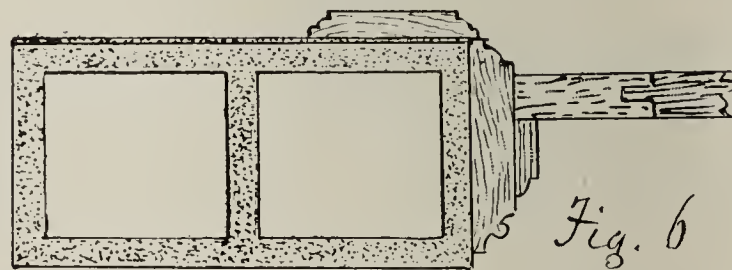


Fig. 6

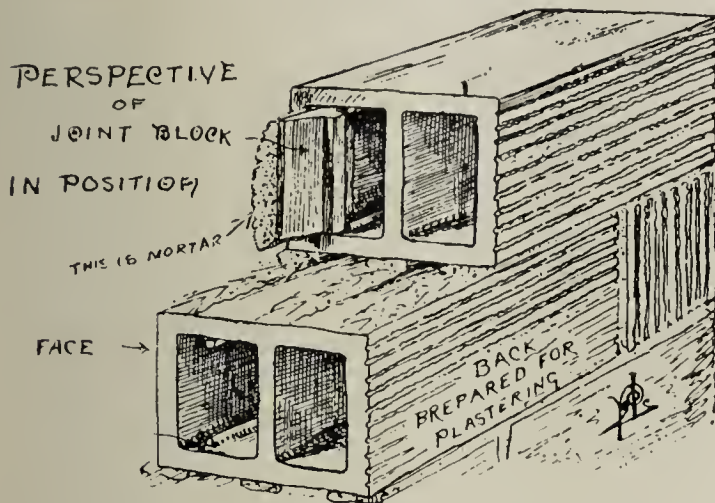
construction of a brick wall of equal thickness, this will be deemed no burden, and it is well known that such a mortar joint has about double the strength of a common lime mortar.

All persons intelligent in building matters know that it is never admissible to finish the interior of a brick wall by plastering directly upon it, and those who live in a region where months of ice and snow prevail know that a rain, followed by extreme cold, will certainly result in forcing the dampness which bricks absorb so largely through the wall, and that a mortar joint, being more porous still than brick, will contribute more than its quota of dampness. We may, then, with confidence, call the attention of all intelligent parties to the fact that hollow blocks, with chambered joints, are a perfect remedy against such troubles. It is also well understood that just the qualities in brick which permit them to transmit dampness will also, in equal degree, transmit cold or heat, and that just the opposite facts are true of hollow construction.

Discussing this matter at one time with a skillful and intelligent contractor in a Northwestern State, he referred to a certain business block which he himself had erected and stated that, while the brick walls were two feet in thickness, he had

been able to discover the mortar joints of the wall through the plastering which was laid on it.

We have not yet reached the limit of security, however, which may be afforded by hollow block construction. As another step, we refer to the double-chambered block, shown in the perspective sketch of a wall corner which is seen below.

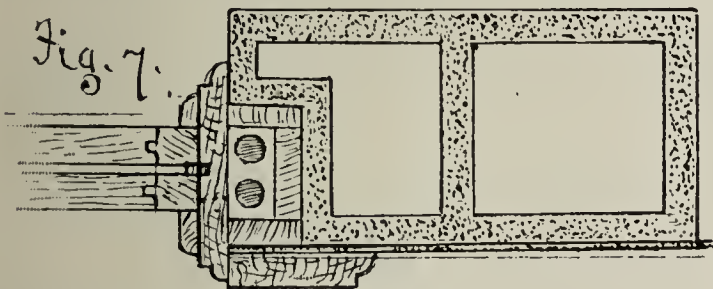


But we need not stop here. If there are any so skeptical as to require it, other steps may be taken that shall not be burdensome, until the most exacting shall ask no more. We have so far referred to walls built of but one course of blocks. To our own mind a double-chambered block, as last referred to, and shown in wall sketch, should meet the requirements for the walls of any dwelling and for three and four-story structures generally.

Where buildings are of such character as to require great lateral strength,

—A Double Course of Blocks—

May be employed, and even more if desired. An ornamental facing block of four-inch thickness, with a six or eight-inch plain block as a backing, would seem to cover nearly all requirements, but ten and twelve-inch double-chambered blocks may also be used as a backing, if the building is of such a



character as to require it. The blocks of the backing course should, of course, be made to break joint with the facing course.

It is not enough that the wall itself furnish needed protection against the elements; the question naturally includes the making of secure joints about window and door frames. The time has been, until recently, when this objection could be urged as fatal to a good wall construction of blocks.

When we commenced exploiting this field it was common to set a window or door frame against the open end of a block. A better way was sometimes employed by the setting of a frame against a block having a vertical chamber, such blocks as are commonly used for corners. Such a door-frame setting is shown in Sketch 6. Still another method was employed by a more painstaking company, a special block being used, shown in Sketch 7—the recess being expected to receive a box window frame.

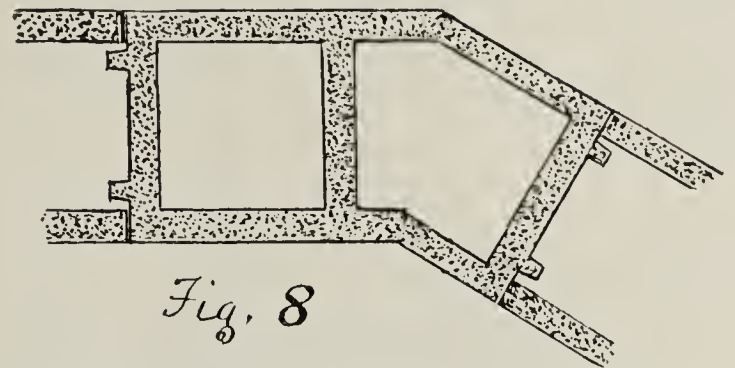
The first method, while it afforded opportunity for wedging the frame in position, necessarily furnished a poor joint against the weather. The second was better in this regard, but the seasoning of the frame was quite sure, sooner or later, to de-

velop a crack between frame and block, through which wind could enter; and both the second and third methods were faulty, in that neither furnished a backing to hold the frame against the disturbing action of a high wind, which would eventually loosen it.

—At Corners and Angles—

Of the walls, also, where a vertical-chambered block is made use of, the joints made were, at the best, second class, presenting to the weather only two thin mortar joints.

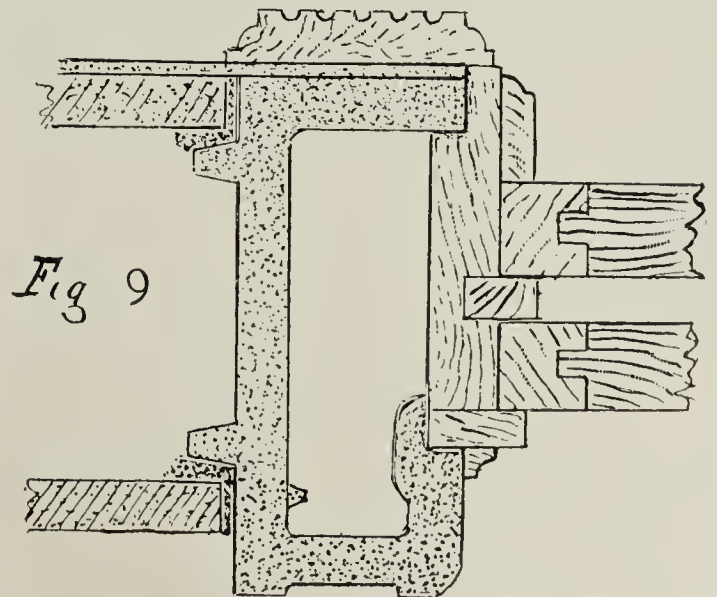
These lacks have all been fully provided against, so that it may now be said a lap joint may be had at every point where a joint occurs. A few illustrations will make plain how this is accomplished. The first shows a window-casing block, which it will be seen receives the window frame in a recess of the block, provides a weight chamber, and by flanges projecting from its back locks into and insures a lap joint connection with the open end of the wall block. The corner and angle blocks



are similarly provided with flanges or ribs to enter the ends of the horizontal chambered wall blocks, as shown in the three sketches immediately following, the first being an angle block as used in wall of bay, and the second angle block used as an angle window mullion in a bay, receiving and holding a window frame on each side. The next figure shows a corner block, with flanges to interlock and furnish a lap joint, whether connected with a wall block at side and at ends, or, as shown in sketch, a door frame at one end and a block at the side.

This general principle of lapping joints, modified as the case may demand, insures not only a good and sufficient weather joint in each case, but at the same time, by the interlocking of block with lock, adds to the stability of construction.

We have as closely as possible attempted to confine ourselves in this paper to the special matter in hand, which the reader will remember is "protection against weather conditions." We have therefore left for future consideration many things that might have been introduced relating to the architectural



and ornamental features pertaining to some of the block forms which have been presented. These will be brought up in a later paper.

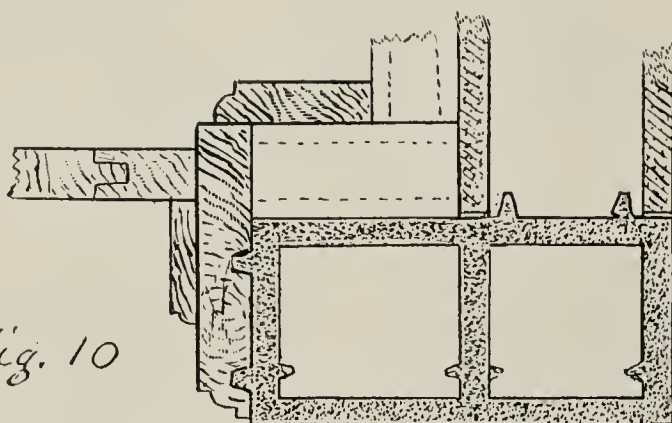
Before leaving the matter of methods of wall construction, however, we will add that it will be evident that an eight-and-

one-quarter-inch-thick block may be employed for the face and body of the wall, and a light three-inch partition block be used as a backing and on which to lay plaster. Such a wall will be very effective and will cost less than the double course of heavy blocks already recommended, but will not possess the same lateral strength. These light lining blocks, being accompanied with a suitable number of halves and quarters, will be well adapted to ready laying.

Before leaving this branch of the subject, we should refer to

—Block Foundations,—

As involving to a greater degree than any other material used for the purpose, protection against external influences. It was in this field that glazed hollow blocks first acquired a reputation. Foundations for a superstructure of eight-inch blocks may be considered ample if made of twelve-inch two-chambered blocks. For a ten or twelve-inch walled building the foundations may well be made of two courses of eight-and-one-quarter-inch blocks. In a large number of cases the annoyance from damp basement walls is very great; in fact, the annoyance is common wherever drainage is not perfect. A damp basement



means, generally, dampness through the house. Rusty furnaces that suffer more from summer idleness than from winter use are common. Freezing basements—where there is no artificial heat—are also common. The glazed hollow block and a cemented floor are a cure for these evils—a bright, clean wall at all seasons, without cost of plastering—a wall that never sweats or discolors, and that never has a frost coating. These features furnish only a partial list of the excellencies of blocks for the purpose named.

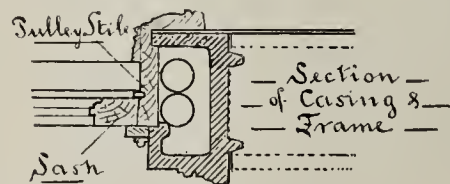
Written for the CLAY-WORKER.

CHEMISTRY FOR CLAYWORKERS. No. 53.



IN CONCLUDING this series of papers for young clayworkers I would remind them that the series is by no means complete, nor the subject anything approaching being exhausted, for the real facts of the case are that any section of chemistry furnishes ample fields of investigation for the natural period of man's life, and a life so devoted would only be able to obtain a glance of the foreground, with a faint suggestion of what lies beyond in the dim and undefined background. Such a view I must admit is not very encouraging; it takes on the appearance of a hopeless task, an endless, job, etc. Fortunately the gloom and sadness lies in the background, and the unspeakable pleasure derived from contemplation of the foreground overbalances the disappointed craving for a look beyond. Aside from the gratification afforded by the knowledge gained on any subject, have any of my young readers been benefited practically by a study of chemistry? Has chemical affinity solved none of the problems of drying and burning clay? Has it not informed us why bricks cannot be thoroughly dried in the drier, but must be finished off in the kiln by "watersmoking"? Does it not play a delicate but very important part in burning red bricks for color? Is it not associated with every change from the clay-

bank to the finished kiln? Nay, further, it is by the overpowering of chemical affinity that clay is made. Decomposition of rocks is only the result of overcoming chemical affinity, that force that holds them together as one substance chemically, no matter how finely divided mechanically; that force that baffles human description. Think of the force necessary to extract the combined water in clay, as in watersmoking. We will suppose, for example, that 100 pounds of coke or hard coal are used hourly for this purpose; that is only one and two-thirds pounds per minute—but what does it mean? It seems

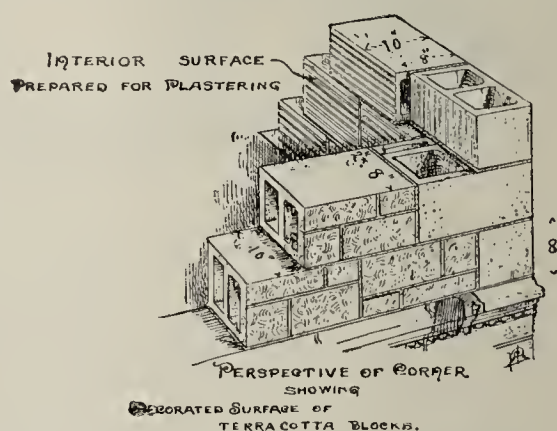


ridiculously incredible to those unaccustomed to look on burning coals as generating immense force, or those who are only impressed by the

warmth they receive, when we assert that the burning of one and two-thirds pounds of coal per minute represents a force of 565 horse power! Now, this is the force generated by burning that weight of pure coke, coal, or any other form of pure carbon, in a minute; no matter whether it is burned in a kiln for watersmoking, under a boiler for generating steam, or in the kitchen stove for cooking dinner, that force is expended. Imagine, then, the force required to watersmoke a kiln, burning fifteen to twenty tons of hard coal for that purpose. This, then, is the power or force we must expend to overcome the affinity of water for clay, and, let me add, water of combination is held by a comparatively weak affinity. In other words, the force which holds combined water in clay and other minerals is very much less than the force by which oxygen is held by silica and alumina.

I would also like to know if the rising generation of clayworkers have derived any practical benefit from a study of "latent and specific heat?" I am perfectly aware of the apathy and even the aversion of some of my much-respected and successful old-timers to chemistry and science in the brickyard and drain-tile factory; they will admit its usefulness in the pottery and finer classes of clay ware, but they have no use for it in the brick and tile works. I will make no attempt to disturb their established faith and bias in old methods, but it must be obvious to all that their successors must move on higher planes, and to them I address myself.

In these days of overproduction and the ensuing disastrous competition, when the most rigorous economy is forced into



every department of manufacture, and the busy brain is planning labor-saving devices, fuel economy and other means of cheapening production, it is indispensable that there should be no uncertainty nor guesswork in the devices and methods adopted for producing the desired results; otherwise the very opposite of our expectations may occur. It is a very easy matter, and an every-day occurrence, to be deluded by an active and unrestrained imagination.

For several years there has been a justifiable desire to economize in fuel, and many meritorious plans have been tried and adopted, while many others, apparently good, have been a source of loss and disappointment. Why? Because failure in such cases is nearly always the result of confiding in opinion

and guesswork. I frequently read in this magazine of schemes to draw the heat from the cooling kiln, or kiln just burnt and ready for cooling, this heat to be utilized in watersmoking and warming up another kiln containing green bricks.

—The Use of Waste Heat.—

Ignoring, for the present, whether such a method of cooling off a kiln is judicious or not, let us see what amount of heat we can get from a brick heated to, say 2,000 degrees Fahr., and for this purpose we will cool another brick of the same weight down to zero, and place this cold brick upon the hot one and assume that no radiation, conduction or convection can take place outside these two bricks. After a certain time they will be found to have the same temperature—not 2,000 but 1,000 degrees Fahr. None of the heat has been lost, but it has been divided by the two bricks. This is clearly the highest result that is possible, even when surrounded by impracticable and next to impossible conditions. I feel rather dubious when I see the phrase, "draw the heat from one kiln to another," especially when the kiln to be drawn from has been carefully closed up almost air-tight. Most of the readers of the Clay-Worker are aware that heat of itself cannot thus be drawn; it is not susceptible to any suction or force by fan, pump, or any other machine. Its transference from one position to another is limited to three modes, namely, radiation, conduction and convection. In the case of transferring from one kiln to another, convection is the only available method, and air is the only available conveyor; but, to carry out the above example and to further illustrate the transference of heat, let us carry, or convey, one of those heated bricks to a kiln of green bricks, just set, and place the hot brick between two cold ones. For the sake of simplicity, we will assume that the hot brick lost none of its heat while being conveyed to its place in the kiln, and, further, that it transferred none of its heat to any other thing but the two bricks between which it was placed; then, when the three bricks have become equal in temperature, we find them at 333 1-3 deg. Fahr. This, I presume, is clear enough. Now let us abandon assumptions and impossible conditions and examine what takes place in practice. First, we substitute air for brick as the conveyor of heat, and we must submit to a large percentage of loss by radiation and conduction. Then, again, the conveyor can only absorb half the heat presented to it, as in the case of the brick mentioned above. It cannot leave the kiln hotter than the bricks in the kiln from which its heat was derived, nor can it absorb heat from the bricks without cooling them. The air in the flues, and the walls of which they are made, must be heated up before any substantial heat can enter the kiln of green bricks, and a certain percentage of heat must be sacrificed for draft, or, if the current is forced, heat is still the moving power behind it. Again, the conveyor of heat, no matter whether it is air, water or some solid, can only give up half its contained heat to an equal weight of the same substance, or a proportional weight of another substance, depending on the specific heats, or capacities for heat, of the substances under consideration.

While writing this article my attention has been called to the method in use at the A. O. Jones Brick and Terra Cotta Works, Zanesville, O. The simplicity of the method will commend itself to all who are desirous of using the waste heat from a cooling kiln, and may be described as a line of large sewer pipe, with one end connecting with the central opening in the crown of a round kiln, and the other end with an exhaust fan in the basement of the drying room, where the heated air drawn from the kiln is allowed to escape and rise through the floors above. Just what is gained by this method is not stated, but we are informed that no harm is done to the cooling ware, as is evidenced by "the surprisingly small quantity of culls." Now, let us not be hasty in drawing conclusions about the culls. Those in sight when the kiln is drawn may perhaps be supplemented by others that will break by ordinary rough handling through their brittleness, due to a chilly cooling, but we are further told that the kiln is allowed to cool for about three days before they begin to draw on this surplus heat, or they

commence taking a portion of the heat "when the red heat has gone." Even then they allow a considerable portion to escape through an opening of several inches between the sewer pipe and top of kiln; eventually they make a close joint and commence taking the remaining heat. By this time you will perceive that more than half the heat of the kiln has been allowed to disappear, and less than one-fourth of what remains is available for other purposes. It would seem questionable if there really is any advantage in it. However, if the cooling ware does not suffer by such treatment, and the comparatively small quantity of heat that is available covers expenses and adds a little to the exchequer, my criticism cannot affect it.

I have long been an advocate for transferring the waste heat from burning kilns, but am not yet convinced of the propriety of robbing the cooling kilns. When we realize that less than one-fourth of the heat in a cooling kiln is available, and that the heat of a brick five pounds in weight, heated up to about



A House Built of Hollow Block.

1,200 degrees Fahr., and that heat transferred or conveyed in the same way as at Zanesville, would only evaporate about three ounces of water from a moist brick in the drier, we cannot avoid grave doubts as to the advantage of such schemes. I have not yet referred to the diminishing temperature of each succeeding increment of heated air drawn from the kiln, but, I presume, that to meet this contingency, or, rather, this self-evident fact, the quantity drawn from the kiln is gradually increased. Without saying more on this subject just now, we would be pleased to see a communication from Mr. A. O. Jones, the father of the scheme, with a candid statement of facts connected with it, and whether the fuel necessary to run the fan, if consumed properly in the basement, would not do as much good.

I am just in receipt of a letter and a ballot sheet from Mr. T. A. Randall, which I have filled out. My regrets are that scientific investigation is not more encouraged by clayworkers. However, a start has been made, and I venture to predict a

growing desire for more of it. It has paid handsomely in every department of industry where it has had any encouragement, and will do no less by the clay industry. Yes, scientific investigation ought to be the motto of future clayworkers, not less the present; but a poor and defective training has been the lot of many, very many, of the past and present workers, and hence defective and wrong conclusions have been reached.

If my son wishes to be a violinist, would I advise him to learn by ear? Certainly not. I would say: "Commit to memory the names of the notes and their positions on the staff, accustom your ear to the sound of perfect fifths, for by these sounds you tune your violin; then look carefully over the scale or gamut of your instrument and commence playing slowly from bottom to top of scale. When by dint of hard practice you can play the scale ascending, try it also descending, trying all the time to make your tones truer and smoother. Now commit to memory the time table, then go on to exercises on intervals, to exercises on time; then study up the half-tones, usually called flats and sharps. Not only remember the different flats and sharps, but why they have to be used when playing in different keys. Now try and acquire celerity and smoothness in playing chromatic scales, both ascending and descending; now study up the major and minor keys and never rest until you can explain and illustrate on your instrument what constitutes the difference."

I need not carry this illustration any farther. You will observe that my son has not yet reached a tune on his violin, but his Cousin Ned—who got a violin at the same time—plays six or eight tunes, which he picked up by hearing and seeing his father play and being coached and told how to finger each tune separately. To a vast majority Ned is clean ahead and out of sight as compared with my boy, whose sensitive nature feels keenly the apparent humiliation, but is still quite aware of his own superiority. He knows Ned cannot play a chromatic scale if his life depended on doing it; nay, further, he knows Ned's father cannot do it, although passable as a fiddler at a country dance. The preparatory scales and exercises my son has labored so hard to master now stand him good service in his introduction to tunes; he finds ordinary tunes or music easy compared with those scales and exercises he labored at so long and patiently, and consequently can play them "at sight," while his ear has been trained to a delicacy in musical sounds that Ned's ear can never appreciate nor comprehend under such a training as his father gave him. Just so, then, with the clayworker, the ironworker; in short, with any worker; he is handicapped in proportion to his ignorance—he can only play by ear. His training, education and ambition have been, chiefly, to imitate well.

Many of my old friends, I am aware, think that I am too persistent in my claims upon the attention of the clayworker for chemistry and science in general, and all that sort of useless bosh. Well, if they will point out to me some other branch of science that is more intimately connected with clayworking than chemistry, I will submit and take a seat further back. It, however, chemistry is too irksome and dry for you, and you tell me you only want as much chemistry as pertains to clay, I can only warn you that your inclination is to play by ear. It reminds me of a fellow workman who saw me calculate the weight of a large armor-plate once in the Atlas Works, Sheffield, England. He was so struck with the ease and accuracy with which I did it that he said he would give anything to be able to do a trick like that. Poor Sam had had no schooling; he could add and subtract in his head, but could not use figures. He struggled awhile with addition and subtraction, but the endeavor to commit up to twelve times twelve "by heart" floored him. He was turned forty and thought he would never live long enough to get half through the arithmetic, and he never did. He always mistrusted me when I told him a small boiler-plate, five-sixteenths of an inch thick, was more difficult to calculate than the large armor-plate.

Now, my young friends, in conclusion, let me say you cannot jump over arithmetic to mensuration; you cannot know any-

thing of music if you sing or play by ear, and you cannot get a knowledge of chemistry but by going carefully and conscientiously through the elements or first principles.

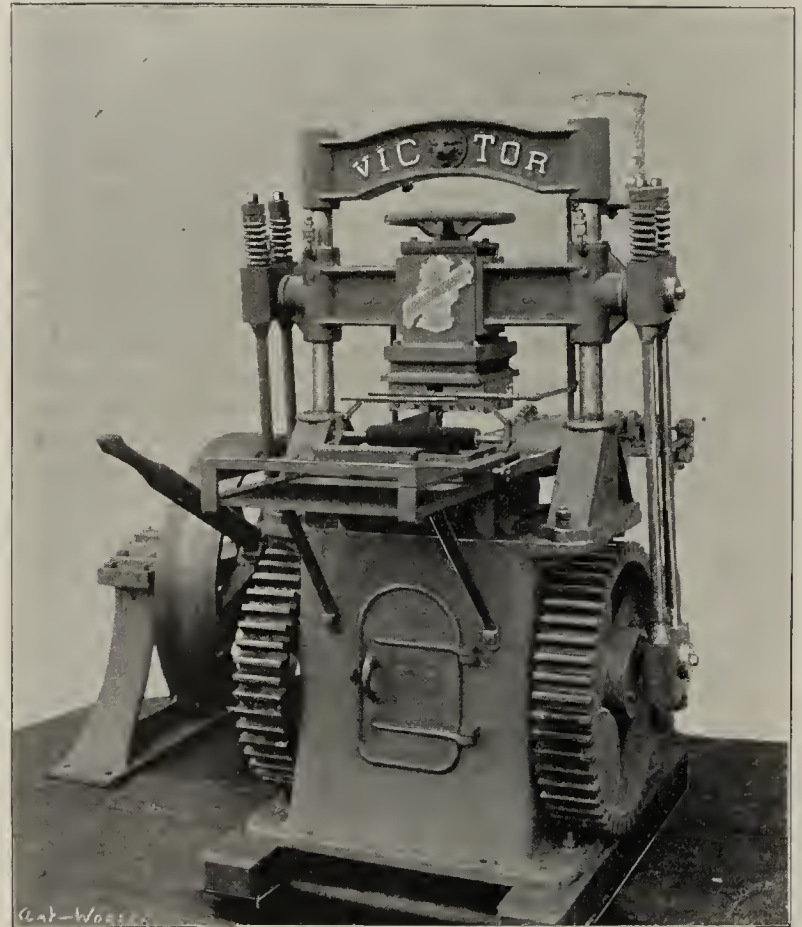
WM. WAPLINGTON.

THE NEW RAYMOND-VICTOR REPRESS.

WE ASK THE ATTENTION of every prospective purchaser of a repress to the illustration of the new Raymond-Victor shown herewith. We believe the most hurried glance will convey a very fair idea of the many superior features embodied in it.

We especially call attention to its few and simple movements, its unique design and unequaled solidity. It is built by C. W. Raymond & Co., of Dayton, O., and will doubtless command more than passing notice.

In 1885 Mr. C. W. Raymond claims to have built the first successful power repress, which claim, we believe, is undis-



The New Raymond-Victor Repress.

puted. The firm, therefore, has had varied experiences in the manufacture of represses, not only for brick of various kinds, but also for shaping almost every form in plastic material—their new Raymond "Victor" being their sixth design in power represses alone. That this machine combines the necessary qualifications for repressing brick rapidly and successfully goes without saying, as the long experience of the builders in this particular line must enable them to attain the most satisfactory results in construction and in the application of the machine to its work. The inventors claim for the machine various features of superiority and originality, which it is not our intention to detail in this article. They are, however, not among those who let the grass grow under their feet, and their latest production in this line is certainly worthy of the most careful consideration of the brickmaking public.

TRUTH IN POETRY.

"We may live without poetry, music and art;
We may live without conscience, and live without heart;
We may live without friends," we may live without fads,
But business to-day cannot live without ads.

—Ad Sense.

Written for the CLAY-WORKER.

PENNSYLVANIA ACADEMY OF FINE ARTS—CLAY-WORKING DEPARTMENT.

BY W. P. LOCKINGTON.



FOREMOST AMONG our institutions of the fine and kindred arts stand the Pennsylvania Academy of Fine Arts and the Pennsylvania Museum and School of Industrial Art. The former, located on Broad street, above Arch, within a stone's throw of the City Hall and the main depots, was founded in 1806, and is consequently in its ninety-first year, and the oldest institution of its kind in this country. Without entering into the details of its birth and growth, let it suffice that we give the introduction proper through the portals of this, the mother institution at a period of thirty years ago, when, with a curriculum which embraced all the facilities for art study, the doors were thrown open and the entry of Mother Earth signalized the efforts of the committee to broaden the interpretation of art.

Modeling in clay at that period found little response. The city possessed practically nothing in the form of domestic sculpture. Terra cotta enrichments and details were unheard of; therefore the use of clay found no great outlet beyond the call of the building world for hard, stretcher and salmon brick.

The Centennial of '76 undoubtedly gave the impetus and brought about an awakening necessary for the introduction of native talent to perpetuate in clay and bronze the silent homage of a patriotic people, and forward from that time the Academy was able to introduce to the old world such men as John J. Boyle, Alexander S. Calder, George Aikin, Charles Grafly and Samuel Murray. To these men belong the honor of having surmounted the obstacles generally attendant upon a new departure, obstacles that are two-fold, since there are efforts to be made in his native element and others to be overcome in the learning of a foreign tongue when that pupil enters the studio of his master in Paris or Rome.

New forms, cultivated ideas and precious rules have to be memorized and old themes discarded before the student can breathe and infuse into his dumb but malleable material the essential form satisfactory to his master.

The modeling department of the Academy to-day represents a hive of intelligent workers, made brighter from the influence brought to bear by instructors possessing the key to the closet of past experience, able to assert, without fear of contradiction, the prescribed lines set forth by such men whose work signalizes not only attempt, but positive success.

The curriculum of the Academy embraces two terms of seventeen weeks each, in which the students work from 9 a. m. to 5 p. m. daily, and from 7 p. m. to 10 p. m. in the evening. The classes are divided into two grades, one working from the cast and fragmentary details, the other from the antique and life. As they progress the change is made from the antique

heads to life, and then the stern reality of working on the human figure in life size forces the material and innate faculties of the students into a realization of their dreams to become sculptors.

Application for admission must be based upon the students' ability to give to the faculty signed specimens of their work, drawn from the solid object and executed expressly for the purpose by the applicant. Admission to the life and head course is determined by the faculty only after an examination of the students' work in drawing, modeling and anatomy.

Two concours are held during the year, the first in January and the second in May.

Being liberally endowed, the Board of Directors, through one of its members, has been enabled for the past six years to offer a traveling scholarship of \$800, providing one year's study abroad. Annual prizes are also given for the two best studies of animals in the Zoological Garden.

The departments for clayworking are large, spacious, well lighted and ventilated, and the collection of casts, figures and ornamental details embraces nearly every obtainable form of the classics. The instructors are William M. Chase for figure drawing, Henry Thouron for composition and Charles Grafly on modeling from figure.

Under the able management of Harrison S. Morris the



Modeling Room of the Pennsylvania Museum of Industrial Art.

Academy has forged ahead in all the departments, and to-day carries upon its books no less than 310 students, one-third being men and two-thirds women, all skillful manipulators of clay.

—The Clayworking Department of the School of Industrial Art.—

The Pennsylvania Museum and School of Industrial Art first obtained its charter in 1876. Imposing in Graeco architecture, it occupies a space of 200 feet facing Broad street and on Pine street to a depth of 400 feet. Its floor plans are such as to afford the students ample room, well lighted and ventilated. Not, however, until 1880 was the clayworking department opened for the better and more practical form of instruction. Under the present instructor, Paul Lachenmeyer, over forty students lend their exertions daily to the malleable possibilities of clay. The equipments are first-class. The drawing and modeling

rooms run nearly the whole length of the building on the first floor of the north side, while in conjunction the students have the benefit of the basement for casting, firing and finishing. Within these two lofty and spacious departments the students are given every opportunity to apply themselves assiduously to every form of industrial work that can be applied through the medium of clay.

Wood work, leather, architectural details, embracing panels, gargoyles, pilasters, columns, frieze and cornice work, all come under the heading of the curriculum; in fact, everything that permits of a consistent parallel is worked in clay.

The life class is one of the features of the school, with the extra advantage of working without limitation as to pose.

The broader mind and more magnetic influence of the principal, Leslie W. Miller, is seen in the interior surroundings and the accomplishment of so much good work. His well-balanced theories and suggestions are conveyed directly to the minds of the students by the following apothegm: "Recollect that a thing once done, and well done, is twice done." The rational sequence is that the students apply themselves happily and work to maintain the tenet of the school, i. e., all work shall have an industrial purpose.

Working in low relief, in the round, and eventually in life size, the classes obtain a beneficial grounding in the technique of both clay and terra cotta work, striking their own casts, and, with the aid of their twelve-foot Dutch up-draft kiln, their own firing.

An established rule of the institution is that one sample of the student's work is always retained and applied to decorate



Terra Cotta Panel Modelled by Mary E. Slater.

the walls. These pieces are not composed of odds and ends, but take the more practical form of building up and facing of an open fireplace, thus calling for columns, facings, panels, frieze and detail work, necessary to the absolute completion of a first-class work.

Under the head of Class "C" the curriculum is as follows:

1. Studies of ornaments from casts.
2. Details of human figure from casts.
3. Animals from casts.
5. The living model.
7. Original designs for ornamental terra cotta.
8. Designs in clay for work in wrought or cast metal.

This last has a good commercial value, since form in the clay can be applied to so many industrial channels, such as designs for wood carving, embossed leather and metal work.

Fine sketches in clay of ornament from cast or print, the anatomy of the human figure and papers on the principles of design as applied to sculptured objects are from time to time prepared by the students for examinations.

Much interest has been evinced by the Principal, L. W. Mil-

ler, in the Ohio school of Professor Orton's, and for some time past he has endeavored to awaken the latent interest of some of our public-spirited men to the necessity of opening at least a department of ceramics, but without success thus far.

Written for the CLAY-WORKER.

CHEAP BRICK.

BY J. W. CRARY, SR.



READ IN THE Clay-Worker that the price of common building brick in the larger markets ranges from \$2.50 to \$5 a thousand. Perhaps these prices are fair, because so large a per cent. of the brick are low grade. Why should the brickmaker be satisfied with this? Why not have 80 or 90 per cent. of his brick first-class? It costs as much to make a low grade brick as to make a high grade. True, there must unavoidably be a few second quality brick. There will be a few overburned and a few underburned, but the well-qualified, true brickmaker will, if he tries, turn out 95 per cent. good hard brick.

—Brick Setting and Burning of Primary Importance.—

We may vary the processes of manufacture and kinds and qualities of clay in making brick, but we cannot vary the treatment in the use and degrees of heat. It is of little importance as to what kind of kiln we use, provided the combustion of fuel is perfect. The up-draft, the down-draft or continuous kilns may all be used with the same effect, provided the controlling skill and attention is the same. Some brickmakers will contend that brick cannot be perfectly burned in any but the down-draft kiln; they have no reason or facts for the assertion, only that they do better with down-draft kilns than they did with up-draft kilns. This is because they never knew how to set and burn brick in an up-draft kiln. They were taught to set brick in the old way, which was to set their arches so as to prevent sufficient draft up through the kiln. They never learned how to get out of the old error in setting, so they prefer a kiln that will suit their education, which was to set brick in the arches so that one brick would cover over the space between two. There would be plenty of open space for draft between two brick, but the spaces would be covered, so that all the openings in the arch were the same as ovens. There was not enough draft to get the heat up through to top of kiln. The result was that the bottom of kiln was too much burned and the top too little, which gave about five to six grades of brick. For instance, "arch," "clinkers," "dark stretchers," or paving, "light stretchers," "dark salmon" and "light" or "pale salmon." The dark and light stretchers were the only high-priced brick. Now, all this came from bad setting, but it just suits the down-draft idea. In the down-draft the fire goes to the top first, that being left open, "three over three," set transversely, of course; the heat readily descends to bottom of kiln, and if there be "dark hard" they are at top, and, if any "salmon," they are at the bottom.

—Well-Managed Down-Draft Kilns Will Effectually Burn Brick,—

And, with emphasis, we can assert the same for up-draft kilns. It is all in the setting and management of the heat. The course of the heat has nothing to do whatever with the effect or efficiency of it. Heat is heat, it matters not what direction it takes. If the same quantity of fuel and oxygen is consumed in a given time, the heat generated is precisely the same, and its intensity is not in any way affected by the course it takes, and all matter exposed to it is affected alike. If a brick be confined over heat it is heated a little quicker than if under the heat, because the heat naturally rises, but if the artificial pressure of the heat

downward is equal to the pressure upward, of course, the effect is the same.

—To Generate, Control and Diffuse Heat Best and Cheapest Is What the Brickmaker Should Study in Burning.—

If we can manage the up-draft, open-top kiln to burn brick as well as in the down-draft, then good economy would suggest



Figure of an Angel, designed by Students. See page 529.

the up-draft. The up-draft can be built much cheaper than the down-draft. Then the brick can be set in and taken out of the up-draft kiln much cheaper than with the down-draft. If, however, there is more uniform certainty in burning first-class brick in down-draft kilns than in up-draft, then the down-draft should be preferred by those who think so.

—Real, True, Expert Brick Setters and Burners Are Scarce.—

Some have the theory without the practice, some have the practice without the theory, and some, that have both theory and practice, have not that peculiar make-up needed for a real, true brickmaker. So far as my experience and observation goes, I have not found 10 per cent. of so-called brickmakers that come up to No. 1. I think Professor Orton will turn out some good brickmakers after they get the needed practice.

I have no quarrel with anybody about brick kilns or brick machines. Every one that is advertised has some merits. An expert brickmaker could operate any of them with success. It would be pitiful to see any one man selling all machines and kilns ordered. But I believe that there are those who would try to do everything that is to be done if they could monopolize the business and pocket the profits. They would risk the losses, with a good bankrupt law in sight.

—We Want More Small Brickmakers, Well Skilled.—

"Diffusion and segregation" is the rule with God and nature. "Exclusion and aggregation" is the rule of man. Concentrate, gather and control is the purpose and ambition of all aspiring

business men and despotic rulers. Modest and meek as brick-makers claim to be, I think one could be found in each State who would, if he could, make and sell all the brick that might be used in his own State, and try to invade the markets of others. Fifty well-skilled small brickmakers, that make only 2,000,000 brick every year, are ten times better for the material growth and just fifty times better for the moral and social growth of the community. It takes a smart, intelligent, respectable man to make a first-class, well-skilled brickmaker. Are the men who make brick over the 100,000,000 mark this sort? Suppose they are. Would it not be better for them, and much better for the community, if they would help fifty well-skilled, poor brickmakers to start and make brick? It would pay them much better to furnish fifty brickyards and get a fair royalty than to run one yard on their own account.

—With Plenty of Well-Skilled Small Brickmakers Brick Building Would Largely Increase.—

If a man desires to build a brick house, and there is only one or two brick plants in the place, he must pay their price and take their brick, be they good or bad; but if he has the option offered by fifty good brickmakers he can get just the brick he may want, not only at a fair price, but have his order promptly filled. If he has to depend on large brick plants they can fix their price, and if a small brickmaker tries to compete he is "cut under" and starved out. The only protection the small brickmaker has against the big one is in his skill and economy. He hires no high-priced skill or help; he pays no large premium for risks; he has no overseers or clerks; he gives his personal attention to every part and detail of his business; he is ambitious to excel in quality of brick, not in quantity. And when a wise man or a competent, honest architect or builder wants brick he will call on the well-skilled brickmaker. If a man wants a good building, good brick are of prime necessity, and he will not spoil his building with low grade brick at any price. There are those who look only for low-priced brick. They are the "shoddies," or what is called in Philadelphia "bonns builders." They make the fronts look very nice, but the internal structure is generally inferior. But the time has come when good building with the best brick only will be demanded and tolerated.

A SMALL BEGINNING MAKES A GOOD ENDING.

T. A. Randall & Co.:

We are starting a handyard to supply a very handsome retail trade. Expect to make 350,000 or 400,000. The prospects are good for a railroad in the near future, and should we get



Modelled by Sarah H. Atkinson. See page 529.

one we would perhaps enlarge so as to work our shale deposit. We appreciate your Clay-Worker very much, and would not like to be without it. We have been interested in the clay industry fifteen years, and with our practical schooling your journal is very interesting.

G. N. VARNER, Blackwell, O. T.

Written for the CLAY-WORKER.

THE CLAYWORKING INDUSTRIES OF VICTORIA, AUSTRALIA. No. 4.

BY F. A. CAMPBELL, C. E.



PROPOSE IN THIS PAPER to give a brief description of one of our oldest pottery works, the only one at the present time working in the vicinity of Melbourne. It is situated at Brunswick, not far from the Hoffman Brick Company's works, which I described in my first paper, and is known as Cornwell's Pottery Works. An exterior view is forwarded herewith, showing one aspect of a portion of the works, the building in the foreground being that devoted to the manufacture of sewer pipes and glazed earthenware. In the building in the distance the terra cotta work is done. A small brickmaking plant existed for some years on this spot, and this business alone was carried on previous to the property being purchased, in 1859, by the late Alfred Cornwell, who gradually extended the works, adding a plant for the manufacture of earthenware and terra cotta.

The brickmaking was, after being discontinued for a time, revived, with a new plant of the latest type, a few years ago, when along with the other brickmaking factories about Melbourne this department was vigorously carried on until the fall in prices about 1892 was such as to render it advisable to stop this branch of the work.

Under the direction of James Allard, who has for several



Cornwell Pottery Works, Brunswick, Australia.

years had the sole management of the works, the earthenware and pottery departments have been continuously carried on and still further developed. Mr. Allard, whose portrait is forwarded herewith, is a good representative of our suburban citizens, being an energetic man of business, taking at the same time an active and intelligent interest in the affairs of the suburb in which he resides. He has acted on the municipal council of Brunswick for some years, occupying during part of the time the position of Mayor.

At the present time the work done at Cornwell's pottery is of three kinds—sewer pipe, earthenware and terra cotta. In regard to the first, the methods adopted are similar to those previously described in my former papers, and do not require any detailed description. The plant consists of dry-pan, crushers, pug mills, elevators and steam presses, the latter capable of turning out pipes from 3 inches to 24 inches in diameter. The building containing the plant is 360 feet by 100 feet, having an upper and lower floor. The kilns, of which there are six, down-draft pattern, are arranged in a line along the center, so that their heat is utilized to dry the green pipe stacked upon both floors before being burnt. Another part of the premises is devoted to the manufacture of earthenware, in which a high degree of excellence has been attained. The articles made include

teapots, jugs, jars, basons, dishes and other such useful wares for domestic purposes. The glazing is done in a first-class manner, fully equal to the imported article. Vitrified stoneware, such as jars, demijohns and bottles, are also made, all of first-class quality.

The clay used for these manufactures is a blend of that obtained on the property with a clay brought by rail from a distance of forty miles. It is carefully prepared by passing it through a horizontal pug mill, where it is well mixed with water, added as required. It then passes through a sieve and flows out in a liquid form upon brick beds, where it lies for a time exposed to the weather. After this it is put through a filter press, and, the superfluous water being got rid of, it is removed and stacked ready for the potter's use.

Most of the articles having a spherical form and a plain body are turned or thrown upon the wheels, which are usually turned by a boy. If the surface be ornamented, the articles are made in plaster of paris molds. These, after drying sufficiently by standing under cover in the vicinity of the kilns, are stacked in the kiln in the ordinary way and lightly burned into biscuit ware. They are then dipped for the glaze and receive the final burning. The general methods adopted in this department are in accordance with the English practice. The kilns, of which there are four, are of the up-draft glost pattern, circular, 18 to 20 feet in diameter, and the fuel used is small coal, from the neighboring colony of New South Wales.

The terra cotta works are in a separate building, removed a short way from the other. The whole of the clay for this department is obtained on the premises, being that layer of brown clay which usually, in this district, overlies the brickmaking shale. It extends from the surface to a depth of fifteen feet or so. It is passed through a pug mill, and thoroughly mixed and sieved when it is ready for use. The chief articles made here are flower pots, which are turned out in all sizes from 2½ to 21 inches in diameter, and are of good quality and color. They are thrown upon old-style kick wheels, in which style of manufacture we do not appear to have advanced much during the last two or three thousand years. After drying they are burned in circular up-draft kilns of the same pattern as those used for the earthenware. The price obtained for them at the present is very low, being about one-half that of four years ago. Six cents a dozen for three-inch pots does not leave much margin for profit. However, these kinds of prices, it is to be hoped, have not come to stay, but will be followed by a revival which will, with fair wages to the laborers, yet give fair profits to the manufacturer.

Written for the CLAY-WORKER.

THE NEW YORK MARKET.

WELCOME THE COMING, speed the parting guest," is one of the maxims of the world. The coming month of June will be heartily welcomed by the brickmaking fraternity, if it does nothing more than give us better weather. The month of May has been very wet. Those who have made a start at making brick will have quite a large percentage of washed brick in the first kiln. None of the yards here began early in the month, still the first pits were washed as well as several others. The rain may be a blessing in disguise, in the way of curtailing the output. A few drops early in the morning will cause the order not to mold to be given.

As the advance agent of prosperity which the spellbinder last fall proclaimed from the platform was sure to be around has not made his appearance in the brick trade, rather his opposite—adversity—has had the call. Smooth, square and well-burned brick have the call, and the price will create no surprise by the amount returned. The indications for the summer months are far from rosy for remunerative rates—what the fall may do, time will tell. Of one thing there is a certainty; that is, that there will be less brick made this season than for some time past. First, a late start—in many cases a month later than the previous years; some of our yards made their first brick

on the 19th of May. Second, there are a number of yards that will not turn a wheel. There are idle yards enough in Haverstraw to take fifty millions of brick off the market. In Hackensack there will be at least from twenty to twenty-five million less made. In one case the yard will not run and on another yard the output will likely not exceed ten million; and this yard has usually turned out over three times that number. There is another yard at Dutchess Junction which puts fifteen million or more on the market, and others that would turn out as many more, and so on, up the Hudson. The idle yards reach the number of brick made. Will the trade feel it to any extent? Of course, the answer is simple, though not definite, and depends on two conditions—the ability and the willingness to hold the brick under the sheds, and, last, but not least, the state of the real-estate market as well as general confidence in what the future has in store for speculative, as well as investment, building. There may be another cause that might upset the best-laid plans for a fall market. If all the brick manufacturers should get the notion in their heads that the outlook is good, and slash them out and mold late in the fall, they would thereby take away the prop that would sustain any advance that might accrue from a shortage in stock.

The tide-water brickmaker of to-day is hard to understand. He will talk early and late about what the trade wants, and wants bad—less brick made. He, without doubt, wants a return for his investment, and if the cry for less brick should bear fruit, that result would be reached. Your readers will see how the Haverstraw brickmakers went in for making less brick as well as reducing the expense of making same. Consistency is a jewel. Does it exist in the brick trade?

—The Excelsior Company,—

Of Haverstraw, was the first yard to mold at that place—or, rather, I should say, was ready to mold when they informed the men that there would be a reduction of fifteen cents per day in wages, and they were going to add another row of brick to each yard. The men refused to go to work. The company then told them that they would replace them with colored men from Virginia. In the meantime other yards were ready, and the same scale of wages, as well as the increased number of brick, were made general. The men, of course, had to fall in line. The Excelsior Company turns out about twenty million each year, and it has a contract for its total make for the season at \$4.62½ per thousand delivered. They also claim that the rate of wages paid does not exceed \$1.35 per day all through, with at least from two to three thousand to each machine more than any other yard, or 26,000 to each yard, or about 2,000 to each man employed around the machine.

—The Increase—

Of each yard at Haverstraw this year by putting out another row does not seem great, but when the cold facts of figures are in evidence it will represent about the output of three yards. The average length of the rows is 300 molds, with six brick to the mold, or 1,800 to the row. Take, as an average, two machines to a yard, and each day means an increase of 3,600 brick to a yard—or, if they molded, say 125 days, about 18,000,000, from forty yards in operation. How is that, in face of the cry for less brick made?

—The Reduction of Wages—

Is always like a motion to adjourn—always in order. The manufacturers do not cut the wages uniformly in all yards, as some put out more to a pit than others. Some were like horizontal Morrison's tariff bill—a straight cut from top to bottom. The following rates of this season compared with last will show the cut. The first list is on sod pit yard, putting out 23,000 to a machine per day. The wages of foreman and second hand were not reduced and can be placed at \$100 per month for the one, and the other at from \$2.50 to \$3 per day:

1896.		1897.
\$2.25.....	Bricksetter	\$2.00
1.75.....	Molder	1.60
1.80.....	Sander	1.70
1.60.....	Dumper	1.50
1.40.....	Trucker	1.25
1.75.....	Cartman	1.60
1.85.....	Pit shoveler	1.75
75.00 per m'th..	Engineer	75.00
1.60.....	Brickwheeler	1.40
1.00.....	Sand boy	80
1.50.....	Bankman	1.40

As will be seen, from ten to fifteen cents per day is the rate taken off on these yards. The truckers hack brick and drive horse and cart; the pit shovelers go into the bank after pit is out and fill the pit on the following day. The gang that runs out the pit with the pit shovelers hack the brick, and are then through. They mold 40,000 to the pit.

1896.		1897.	1896.	1897.
\$2.00	\$1.80.....	Bricksetter	\$2.00	\$1.85
2.00	1.80.....	Molder	1.75	1.60
2.00	1.80.....	Dumper	1.75	1.60
2.00	1.80.....	Sander	1.75	1.60
1.40	1.25.....	Trucker	1.50	1.35
1.60	1.50.....	Mold sander	1.50	1.35
1.75	1.55.....	Temperer	1.75	1.60
2.00	1.85.....	Pit shoveler	1.50	1.35
1.60	1.40.....	Bankman	1.50	1.35
1.75	1.55.....	Cartman	1.50	1.35
3.00	2.00.....	Engineer	3.00	3.00
1.25	1.05.....	Sand boy	1.00	1.00
1.60	1.40.....	Brickwheeler	1.50	1.35

On one of these yards they have five men in the pit at \$1.35 each. On the other three men do the work at a higher rate of wages; the pit shovelers, with the machine men, hack the brick, which is not a long job for twelve or thirteen men to put up—40,000—and their day's work is done at about 12:30 each day. On the one yard, two setters and four wheelers set in the pit, and their day is finished. On the other there are two wheelers to a setter, but they work all day, from sunrise to 6 o'clock in the afternoon. It does seem that a change would be a benefit. It is possible that the boss does not want to strip the yard of men, in case a shower should come up, and he will



JAS. ALLARD, Manager Cornwell Pottery Works.

have six men to batten hacks, where the other yard will have to pay for battening and saddling, as all the men are through.

—Hours and Wages—

Have always been disputed questions among brickyard labor. "Give us more money; never mind the hours," is what they say. What hours do they work to-day, with but rare exception, on a yard where 23,000 bricks to the pit is turned out? The pit is out by 10:30, three men hack a pit and at 2 o'clock are done; the pit shovelers fill pit with dumper and truckers, and are often through by noon; the molder, with three men, will set in a hack and be through by not later than 3 o'clock; the men who wheel brick will be through by 2 p. m. If they go to work, say at 4:30 in the morning, and all work till 2 p. m., with one and a quarter hours for breakfast and dinner, they would have put in seven and one-quarter hours, when really, in the majority of cases, they put in not over six hours; and on the other yards, where the machine gang hack, seven actual working hours will cover the time. If that point is brought to their notice, the reply will be: "See how hard we work." Yet they will try to get work to do in the afternoon, if possible, which goes to show that the labor of the morning was not so exhaustive as they would have one believe. The rate paid per day, low as it may

be, will compare with the general scale paid in other trades. Of course, it is far from steady work, but what the attraction of working on the brickyard may be is beyond my ken, as I have known men to leave steady work to put in a few months' time on the brickyard.

—Quick Preparation—

Of yards for the making of brick has been the rule this spring. I question whether the time taken on some of the yards has ever been excelled. When one takes a four-machine yard just as it has stood from the time of stopping the fall before, with the shed all battened up, and on the third day is ready to mold, he is pushing things; yard rolled, hack plank down, batten and saddles on the yard and pits filled in that time. The next yard was four days in preparation, but the ditches were all repaired and the yard patched and all done in forty hours' actual work. There was not a machinist employed on any of the yards this spring. To many of your readers it will seem as if it were taking big chances not to see that the machines and line of shaftings were in good order. As for overhauling carts, trucks and wheelbarrows, they had to be in a very bad condition to be sent to the repair shop, as all were good enough for the present price of brick; each and all were bent on making the things serve another year.

It is easy to see that times are not at high-water mark in the brick trade; economy is the word. If the same economy was practiced at all times, but not to the extent as would endanger the machinery, there would be more money in the owners' pockets. On one yard a new machine was put up, the proprietor being the machinist, and a good one at that.

—A Slide of Clay—

At Haverstraw dropped the road at the south part of the town several feet, and it took the services of several men and carts some days to fill in the depression, without, however, any cost to the taxpayers, as the brickmaker was very glad to repair the yard, as it was caused by his sinking for clay too close to the thoroughfare.

Rents seem to feel the depression to a marked extent, especially in Haverstraw. The \$1 and \$1.25 rate, with power, is a thing of the past. Whether it will return, remains to be seen. In fact, there are yards now leased at a percentage of 12½, while 65 cents per thousand is generally asked, with power furnished—or, say, less than 10 cents per thousand to the owner. In Hackensack, yards which paid 40 cents per thousand for the past two years were reduced to 25 cents per thousand this spring. If all leases were out it would be a great benefit, as bottom rates can now be obtained—that is, if the trade is going to react at all.

In line with reduced wages, as well as rents, the Consolidated Brick Company dropped its commission rates from a fixed sum to a percentage, for a guaranteed sale; that is, if the sender wishes the cash he will be charged 12½ per cent. per thousand—or, say his brick brought \$4 per thousand, 10 cents per thousand would be the rate charged. If he does not want cash, but takes a note, he will be charged 1½ per cent. per thousand, or 6 cents per thousand, a one-half reduction on former scale—and it all helps. It means, on 4,000,000, \$240 saved. No doubt the commission man thinks the company is going to the —, but they are still at the old stand doing business.

—The Market—

Takes the stock as soon as sent in, which would be called good; and one would say, that being the case, prices should advance, but they do not seem to. It is a peculiar state that the reports which appear in the local papers from commission men say that the prices should be higher. Then why, in the name of all that is good, do they keep them at the low rate? Depend upon it, the blind will see. That argument is weak. Stand up like men and do not blame it on the other fellow.

Haverstraw	\$4.50@4.75
Fishkills	4.50@4.75
Up Rivers	4.25@4.62½
Hackensack	4.25@4.50
South Jerseys	3.50@4.25
Pale	1.50@2.00

A. N. OLDTIMER.

PRO AND CON.

It will be noticed, by a glance at the advertising pages of this issue, that the American Clayworking Machinery Company, of Bucyrus, O., replies to the card of Chambers Bros. Company in reference to the patent decision against J. W. Penfield & Son, of Willoughby, O. The American Company emphatically states that the decision in no way affects their machinery, and, as a guarantee of this, they agree to protect all purchasers of their automatic cut-offs from any loss, costs or damages by reason of any alleged infringement of patents.

AKRON—A GREAT CLAY CENTER.

There is probably no place in the United States where the manufacture of clay products is as diversified as in Akron and vicinity. Almost every article known to that trade is made right here in Akron.

Among the many interesting factories in that line is the plant of the Diamond Pottery Company, of which Mr. F. A. Wilcox, of the real estate and insurance firm of Wilcox, Noah & Co., is President, and Mr. W. B. Gamble, ex-Sheriff of Summit county, is Secretary and Treasurer. This company manufactures all kinds of plain and fancy flower pots, decorated jardinières, cuspidors, stand and window pots, hanging baskets, umbrella stands, lawn vases and all of the latest novelties in embossed and decorated ware of this description. This is the only plant of this kind in this part of the country, and their product finds its way into almost every State in the Union. The method of handling the clay is the same as in any modern stoneware plant. A clay press manufactured by E. Weisner, of Baltimore, Md., is used, after which the ware is dried by steam and placed in two twenty-three-foot kilns of 80,000 flower pot capacity each. Emerging from the kilns, the ware is sent to the decorating room, where it is handsomely finished in tasty colors and decorations, and is then ready for the market. These goods are all made from the newest patterns and designs, and are as durable as they are beautiful. This is now the company's dull season, but up to May 1 they reported an excellent business, and are now booking many orders for the fall trade.

Some idea may be obtained as to the volume of sewer pipe business done in Akron and vicinity when it is known that over 1,050 carloads of sewer pipe were shipped from here during the month of May.

A charter has just been granted at Columbus to the Vitrified Roofing Tile Company, of Akron, O., with a capital of \$25,000. The incorporators are J. A. Vining, O. H. Coolidge, A. D. Armitage, W. H. Kasch and G. F. Kasch. The company is organized for the purpose of manufacturing and putting on the market a superb quality of roofing tile and all appurtenances thereto, including all kinds of ornamental trimmings. They also expect to construct and put on roofing of their manufacture, furnishing competent and experienced men to do the work, and furnishing in their contracts a written guarantee as to its durability, etc. Mr. G. F. Kasch, the promoter of the project and Manager of the new company, claims to have given many years of study and attention to this particular line of business, and informs the writer that by his process they will be able to make a superior quality of tile at a much less cost than any now on the market. They have bought the plant formerly occupied by the Akron Paving Brick Company, and are now engaged in refitting and equipping it with new and improved machinery. They expect to be making tile by Sept. 1.

The sewer-pipe men are having a hard and bitter fight in the organization of the big "pool" spoken of in last month's issue of the Clayworker, under Akron Items.

While the organization has been completed, yet the committee has failed to get it in operation, owing to the war which is on between two or three companies in the organization. There are, altogether, forty-four companies, and all are ready but the Hill Sewer Pipe Company, of Akron, and the National Sewer Pipe Company, of Barberton.

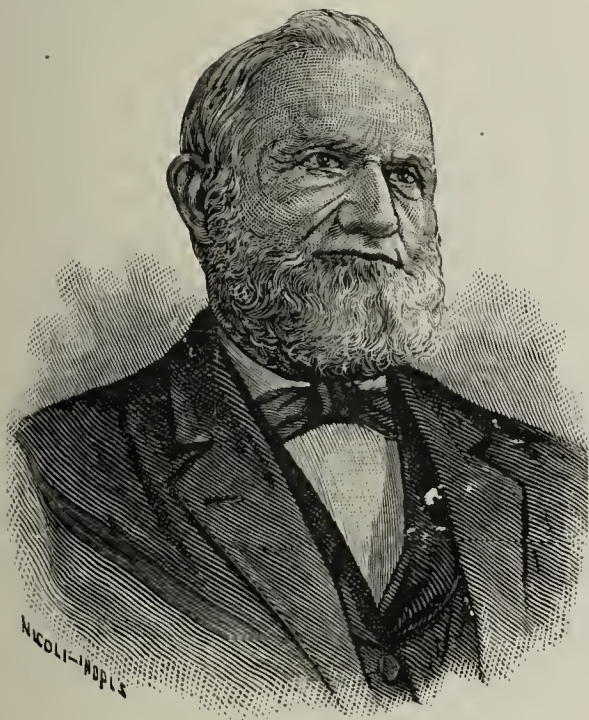
The trouble between these two companies dates back some time, when the old "selling agency" here was in operation, when the officers had some trouble about percentages. This old trouble has been revived and has now assumed a shape that is liable to keep the operators from deriving any benefit from the new "pool." The pool wants D. E. Hill for its President, and this is objected to by the National Company, who refuse to come in if he is elected to that office. Their business is of such proportions that they could create havoc by remaining outside. While this boy's play is going on the sewer-pipe business has reached a demoralizing condition. Prices have been cut and many of the companies are operating their works at a great loss. Much of last year's product is still stored in the yards, and it would be no surprise to see many of the plants close down throughout this locality, thus throwing thousands of men out of employment. If the warring companies can be got together, this can be averted, and the hopes of all in this section are for this end. In the meantime the consumers of sewer pipe are reaping the benefit of the competition, but if this war continues long the wages of the workmen will be reduced to such an extent that they will be unable to exist, as it is a conceded fact that the wages paid in the sewer-pipe business are not the most remunerative. Thus it will be seen that the condition of the people will be pitiable.

DEATH OF J. W. CRARY, SR.

The Clay-Worker's Veteran Contributor Passes Away at the Ripe Old Age of Eighty-Three.

IN THE DEATH of John W. Crary the clayworkers of this country lose one of the pioneers of their art. He was a man of sterling character, great versatility, with a high regard for the welfare of his fellow-men and one ceaseless in his activities up to the time of his death. He would have been eighty-three years of age had he lived until the 30th of November next. We have a letter from his son, J. W. Crary, Jr., from Bluff Springs, Fla., in regard to his death, which occurred on the 3d of this month. It is the sincere expression of one who had learned to appreciate the strength and goodness of his father, who, he says, had so planned his life that his children could grow up and live about him, or, as he expressed it, so that he "could blow a horn and all could hear it." It was his pleasure to realize his plan. All had places near him, and all but two were with him to the last.

Mr. Crary was a native of Hamilton county, Ohio. His grandfathers came from Vermont, and were soldiers in the war for independence. Like his father, he was a brickmaker and a layer of brick, and was general superintendent of this kind of work from his earliest boyhood. His inventions were many.



J. W. CRARY, SR.

He patented a brick kiln and machine in 1858, several features of these patents being now in general use. He took out a patent for heating houses, using clay materials entirely in the construction of his heater. Among many other inventions was the plan for covering ships with iron, and he had in his possession published evidence that he suggested the cladding of the old war ship Merrimac, which distinguished herself in the late war. At that time he was preparing to clad a small vessel to carry a single gun and make a breach in the walls of Fort Pickens. He invented a peculiar shot, or arrow. It was a short, pointed bomb, with a light, hollow tail to give it the precision of an arrow. The body of the shot contained a charge of powder. Connected with it was a cap and a striker, and simultaneous with its penetration of a wall or other substance it exploded, and, of course, a great breach was the result.

Some of Mr. Crary's prominent work was brickmaking by contract for the United States Arsenal at Little Rock in 1840, the laying of brick for the State University of Mississippi in 1846, the superintending of the making of brick for the United States Custom House at New Orleans, and other work at Fort Jefferson, on the coast of Florida, at Birmingham, Ala., and other points throughout the South. Mr. Crary was the pro-

jector of the village of Bluff Springs, Fla., and was its main proprietor. In 1890 Mr. Crary wrote a book entitled "Sixty Years of Brickmaking." It was published by the proprietors of the Clay-Worker. He was an original thinker and investigator, and a thoroughly practical man. As he says, "There are thousands of compilers, but few real authors of books." As early as 1867 he went to New York city to collect material to aid in the preparation of a treatise on brickmaking. He says that at that time he found no book on brickmaking, and that the general information on the subject which he was able to find in scattered articles was of such a perfunctory character that he found it best to rely on his own experience. He was active in every relation in life. He held some important offices at the earnest request of fellow-citizens, without regard to party. He always showed an interest of a practical character in those around him. He was much interested in the higher politics of his own country, and the last article which he wrote was entitled "The Arbitrary Rule and Dictation of Organized Wealth."

Certainly his was a useful life. Much that he did was of more general benefit to mankind than to himself. The result of his activity produced more for the good of mankind than for the individual. The world is much the better and happier for his having lived in it, than which nothing better can be said of any man.

WHAT IS "GOOD AND WORKMANLIKE MANNER."

A CONTRACT for the tile work in a cathedral that was being finished in very elegant and expensive style stipulated that it should be done in "a good and workmanlike manner." When suit was brought for the recovery of the price agreed upon, the defense was interposed that the work was not done in accordance with the contract. The trial judge instructed the jury that these words were to be construed in their usual and ordinary acceptance among skilled workmen in the community where the contract was made and to be performed. He refused to give an instruction to the effect that the jury, in determining whether the work was skillfully done, should not take as a basis the skill of those performing such labor in any particular locality, but the skill of those who hold themselves out generally to do the work in question. Now, there was evidence tending to show that there were no skilled tile layers in that community. Also that, although the work in question was done as well as such work was usually done there, yet that it was to a large extent defective and did not follow the pattern after which it was designed to be laid. This, when the man was notified that "nice work" was expected, saw the pattern, professed himself competent to do the work and expressly agreed to do it in "a good and workmanlike manner." He got judgment in the Circuit Court, but the Supreme Court of Arkansas reversed it, April 17, 1897 (case of Fitzgerald v. La Porte), on account of error in regard to the instructions. It says that the words just quoted are of general use and well-defined meaning. They meant, in substance, that the man would do the work as a skilled workman should do it. He could not be allowed to say afterwards that he meant only that he would perform the work in a manner considered good and workmanlike by the local tile layers of the community. It was not so stated in the contract. True, in determining the question whether the work was skillfully done, the jury might be largely governed by the testimony of the local tile layers, builders and architects, for, probably these, on account of their accessibility, would be called as witnesses; but the question to be determined was not whether the work was done in a manner considered skillful by them, but whether it was done in a manner generally considered skillful by those capable of correctly judging such work, whether in that community or elsewhere. Still, the court holds that if the work was defectively done, if it was done substantially in accordance with the terms of the contract, or if there had been an acceptance of the work, the party could recover the contract price, less the cost of correcting such defects.

THE TENNESSEE CENTENNIAL EXPOSITION.



ONE PLEASANT DAY in May the writer, accompanied by his better half, stepped from an L. & N. train, in the quaint old station at Nashville, whither we had journeyed to view the wonders of the great Tennessee Centennial Exposition. We expected much, and were disappointed in but one particular: Tired of winter, which had lingered too long in the lap of spring, we fully expected to get our first taste of real summer weather here, but found the temperature about the same, or, if anything, a little cooler than we had been experiencing at home in the North, light wraps being desirable, particularly after sundown. The cordiality and warmth of the Nashville people more than compensated for this one disappointment, and made our visit very pleasant, indeed.

While situated nearly two hundred miles south of Mason and Dixon's line, which, fortunately, is now but a memory, Nashville displays energy and enterprise equal to that of any of her Northern sisters. If, as it is so often stated, Southern people are slow and easy-going, they have a faculty of accomplishing results, at least Nashville people have, as is clearly proven by their great Exposition, which is a remarkable exhibition of enterprise. We doubt if there is another city of a hun-

placoe in this part of the show. It's very fakey, we think, but is given a place on an adjacent hill, all to itself, where it is housed safe from the inquisitive sightseer. It is literally out of sight, except at rare intervals when the air is calm and the professor's nerves are equal to a flight in the ether.

—Chambers Bros. Company's Exhibit.—

As previously announced in the Clay-Worker, the Chambers Bros. Company, Philadelphia, Pa., has departed from the rule which of late years has prevailed with the manufacturers of clayworking machinery, and made a very elaborate display of their brickmaking machinery. Near the power house, where steam is converted into electricity, with which the many wheels of the Exposition are driven, Chambers Bros. Company has erected a building for its own exclusive use. It is a frame structure, covered with corrugated iron, so put together that it can be taken apart and again used for a similar purpose if desirable. The lower part of the front of the building is divided into sections or doors, 8x8 feet, hinged at the top and connected with pulleys and weights, so that each one may be easily swung up, thus forming a canopy or awning, and exposing to the view of passers-by the entire exhibit. Nothing attracts people like the whirl of machinery. We all like to see the wheels go round, so that almost every visitor who comes within seeing or hearing distance of the building is attracted, and after watching the

apparently simple process of turning out brick at the rate of a hundred a minute, is presented with a tiny burned brick, two inches long, one inch wide and a half inch in thickness, on which is stamped "Souvenir, Chambers Bros. Company, Philadelphia." As one stands at the rail which prevents the too inquisitive visitor from putting his fingers in danger, one of the first things to catch the eye is the legend, "Making Brick Without Straw; the Task of Israelites Made Easy," which is emblazoned on the wall opposite. This is a favorite expression of Mr. Cyrus Chambers, Jr., the senior member of the firm, and one which the exhibit illustrates to per-



Building Erected at Nashville Exposition by Chambers Bros. Co.

dred thousand people in the land that is capable of carrying out such a stupendous undertaking so successfully as they have done. The Exposition is in every sense a credit to Nashville and the people of Tennessee.

The principal buildings are all that can be desired, being well designed for the purpose, and remind one very much of the masterpieces of the World's Fair. The Parthenon, Machinery Hall, Government Building, Transportation Building and the Negro Building are each imposing structures, and contain countless exhibits that illustrate the advance in every department of life, particularly the industrial branches. In addition to those named, there are many other buildings worthy of note. New York, Ohio, Kentucky and Illinois have erected handsome State buildings, the latter reproducing in a reduced form the famous Administration Building, thought by many to be the handsomest building at the World's Fair.

Not the least attractive feature of this truly great show is "Vanity Fair," which is the "Midway" rechristened. Here the same swarthy sons of the desert beguile the pleasure seeker with tom-tom music and the beautiful daughters of the Nile do the "koochie-koochie," etc., etc. The great air ship deserves a

fection. To the extreme left is a fine Westinghouse self-contained high speed 75-horse-power engine, which furnishes the power to run three Chambers machines, all of which are shown in actual operation. They are arranged in a row across the north end of the building, and receive the clay from a combined pug mill and conveyor above them. The first is an end cut machine, with a capacity of 7,000 brick an hour. After the brick are cut from the bar of clay they are edged and carried on a belt, from which they drop through a hole in the floor on to a conveyor running beneath the floor, which drops them into a second conveyor, on which they are carried up and dropped back in the pugger. So the process goes on automatically.

—Something New.—

The second machine is smaller, having a capacity of 2,500 brick per hour. Connected with it is a new addition to the Chambers family in the form of a head sanding machine. After the brick are cut in the usual way they are lifted from the belt and placed lengthwise across another belt, on which are fastened iron cleats, which force the brick between two large circular brushes, the lower portion of which run through sand,

which is brushed against and into the rough ends of the brick, which are then passed on to the cars or trucks in the usual manner. End cut brick treated in this way are said to be equal to hand-molded stretchers. The device is novel, and will prove quite valuable to those who make end cut brick, as it removes the objection to their use as headers.

The third machine is the same as the first, but is equipped with a side cut table. To the extreme right, and on a line with the first machine, stands a Chambers repress of latest design. It is a monster, weighing more than twenty tons, and yet it is so nicely adjusted that it runs without the least apparent jar or strain. Back of the repress is a track and turntable, on which run their brick cars, both single and double deck, and beside these is a monster dry pan and a Potts-Chambers disintegrator. In this end of the building is Mr. Chambers's desk or office, where he may be found usually from 9 to 12 and from 1 to 5 o'clock, ready at all times to extend a cordial welcome to each and every visitor who, like himself, is interested in "making brick without straw."

All in all, the display is a model one, and does great credit not only to those who conceived it, but as well to those who erected the building and installed the machinery. This work was done under the direction of Chas. B. Lynch and John B. Smith, both of whom have been in the employ of Chambers Bros. Company for many years, and take as much pride in the exhibit as does Mr. Chambers himself. With the assistance of Mrs. Chas. Smith, who has charge of the office, Mr. Walter Buck and John Smith (a gentleman of color), the display is kept in "apple-pie order" from early dawn till dewy eve.

One cannot scrutinize this splendid exhibit and estimate the cost, both in labor and money, the latter amounting to nearly \$20,000, without admiring the nerve and enterprise which made it possible. Mr. Chambers for one, at least, believes that there is a future for the brick-maker. Speaking to this point, he said to the writer: "I have been laboring for many years in this work, and in no similar period have I accomplished so much as during the past year, and at no time has the prospect seemed more promising than now." Cheering words, these, especially when backed up by such substantial evidence of sincerity.

There are a number of attractive displays of brick, pottery, sewer pipe and raw clays in the Manufacturers' Building, all of which we hope to lay before our readers before the close of the Exposition, which continues to Dec. 1.

A RECORD FOR CLAY.

The advance sheets of the annual publication, the Mineral Industry, issued by the Engineering and Mining Journal, show that the year 1896 was the greatest ever known in mineral production in this country, the record having never been reached before in the United States or elsewhere. The total value of mineral products for the year reached \$706,015,411, an increase

of \$24,000,000 over the preceding year. Bituminous coal, worth \$116,000,000, took the first place, with pig iron, worth \$92,000,000, ranking next. Following in the order of importance were anthracite coal, \$88,000,000; clay, \$65,000,000; gold, \$58,000,000; petroleum, \$56,000,000; copper, \$49,000,000; silver, \$37,000,000, and lime, \$30,000,000. The United States produced more gold, more silver, more pig iron and more oil than any other country. More than half the world's supply of copper is furnished by American mines. The output of copper was 467,822,923 pounds, the largest amount ever known.

No other country in the world has so valuable a mineral production and no other has so wide a variety. There is scarcely anything we need in large quantities that we do not find in one section or another of the United States, and little but what is so abundant that other countries find their supplies here, at least to some extent. When it is remembered that prices were low in 1896 the production is uncommonly large. Yet it is not so large as may be looked for when business resumes its natural conditions. But the abundant output must be regarded as



Front of Chambers Bros. Co's Building at Nashville Exposition.

one of the signs of returning prosperity, which are visible on all sides.

The foregoing, which should make every one interested in the clay industries of the United States swell with pride, was received by mail recently by the American Clayworking Machinery Company, of Bucyrus, O. Accompanying the clipping was the following bright letter, which is also interesting:

"Pittsburg, Pa., June 4, 1897.

"The American Clayworking Machinery Company, Bucyrus, O.:
"Gentlemen—You will note from the inclosed clipping from to-day's Pittsburg Times that the value of clay products during '96 exceeds the value of gold mined in the United States. Now, I do not attribute this all to the mud-slinging campaign of '96, but in a large measure to the use of the famous American Clayworking Machinery Company's machines. I consider this an important record for the clay industries. Respectfully,

"E. G. REID."

Jno. B. Jennings writes that a new brick plant, of which S. J. Stark, of Tunkhannock, Pa., will be business manager, will be established at North Mehoopany, Pa.

OBITUARY.

Another Member of the N. B. M. A. Joins the Silent Majority.

W. E. Sidney, formerly employed by the Wallace Manufacturing Company, but more recently connected with the Buffalo (Ia.) Brick and Tile Company, died June 7 at the Indiana Insane Hospital, where he had gone for treatment a short time previous. For several years Mr. Sidney had suffered from indigestion, which finally wrecked him physically and mentally. In early years he was exceptionally bright and industrious, and, being very kindly and social, made many warm friends among the clayworking fraternity. He was an active member of the N. B. M. A. and most of the State Associations, being a regular attendant of all brick and tile conventions. He leaves a wife and two children.

BUTTON-HOLE TALKS.

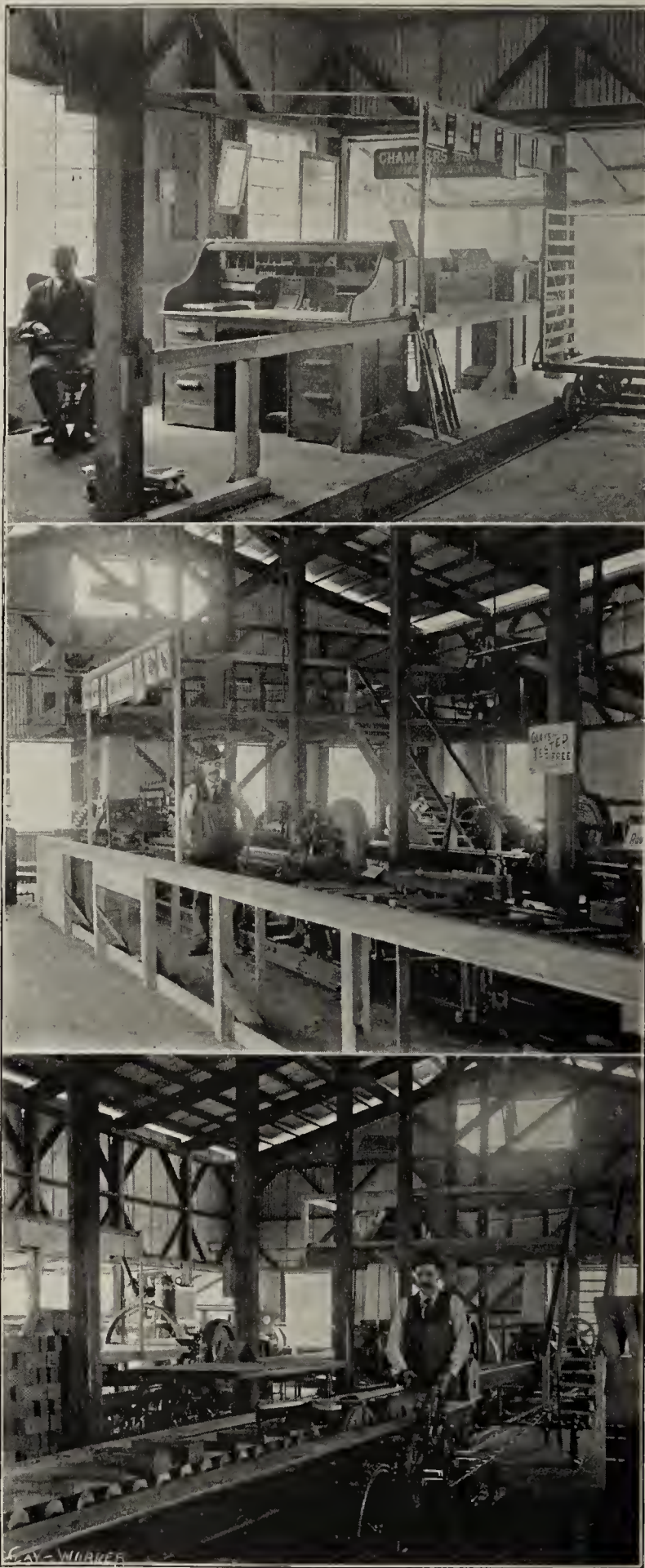
"**S**AY, GATES;" his voice was so earnest that I could not help but linger, and, besides, his finger was so firmly hooked through my already well-worn buttonhole that I could not escape, so I waited and listened. "Say, Gates," he repeated, when he had me fixed and located, "did you ever notice how funny men act when they are at these conventions and away from the restraints of home. Soberest kind of fellows at home get frisky here, and then, just as likely as not, fellows who are frisky at home are staid here. Oh, hold on, come off; none of that, now; I didn't say stay here or stayed here, but, you know, sober, stiff, glum, dignified or any other old thing you want to call it.

"But, then, it's so with everything—even so with the birds. Why, you can remember, if you will only think, when you were a plain, green barefooted country boy, attired only in ragged pants and shirt and one 'gallus,' trimmed only with freckles, stone bruises and a yearning for more pie, as you sauntered down the lane to the pasture after the cows, all untrammelled with the stain and guilt of city life, with its artifice and corruption; you remember how then you paused, always stopped, to look at that feathered embodiment of happiness, the bob-o-link, as he poised himself in hovering ecstasy and fluttered and thrilled while he filled all the meadow with his happy trill of pleasure, and, while voicing his ecstasy, gradually settled to the waving top of a mullein, pluming his jetty black and silver-white trappings for further revels. His voice and his picture have always stood thus in your mind for hearty, happy freedom from care, instantly recalling happy, careless days amid green fields—free, happy laughter, bare toes, freckled noses, quick, pulsating blood and mind unburdened with artificial restraints, iniquities or worries.

"Yet this same, happy, careless bird, after his family has been reared in the Northern meadow, when he goes South for a winter's vacation, changes completely. Speeding to the Carolina rice fields and changing his gaudy coat to one of sober gray, he gorges on rice, until, with skin stuffed full of fat, he answers to the sportsman's gun and is offered up as a fat 'rice bird' on the epicures platter. Truly, a sad ending for the jolly, happy, careless friend of our boyhood days.

"Then, there is the robin, our staid old friend. The embodiment of integrity in bird life. So constant in marital attentions; so diligent in house building and so unremitting in his labor as a provider for a large and rapidly recurring family. Most reliable and respectable of birds, as you knew him when a boy. What does he do when the Northern summer is past, when the two or three sets of children have been successfully launched out on their own hook, after having been provided with an endless array of wiggly-worm breakfasts, lunches and teas, all personally looked after and attended to in detail by this very sedate and industrious parent? Why, when he goes down South, down into your land of the 'magnolia and bay, the youpon and titi,' your land of winter sun and rest, where yeast

won't work and iron won't rust, when he gets there he, too, takes a change. No sooner has he safely gotten there, far from home and its surroundings, than he falls to on the naturally fer-



Glimpses of Chambers Bros. Co's Exhibit. See page 536.

mented berries of the China berry tree, and, gorging himself on them, goes in for the very biggest drunk that is known to all bird life, and is a scandal to all feathered tribes. Staid and demure at home, here, away from those restraining influences and exposed to temptation, he falls, and he falls quick and hard.

"Now, Gates," said he, "you just sit right still a minute here and I will point out both kind of birds among our brickmaking friends." Right here I broke away from him before any names were called, for I wanted no idols of mine shattered. He had shattered my feathered idols, but he should not shatter my brickmaking ones, so I fled.

GATES.

THE N. B. M. A. SCHOLARSHIP.

HAT THE COMMITTEE on Technical Investigation which President Brush appointed some time ago, notice of which appeared in the March Clay-Worker, is by no means idle, and is actively discharging its duties, will be evident from the following report, which comes to hand just as we go to press:

Columbus, O., June 16, 1897.

T. A. Randall, Esq., Secretary N. B. M. A.:

Dear Sir—I hasten to inform you, in behalf of the Committee on Technical Investigation of the N. B. M. A., that the examination of the applicants for the scholarship in the Department of Clayworking and Ceramics of the Ohio State University has just been completed. The number of applicants was three, a very fair number, considering the lateness of the date when the announcements of the competitive examination were made public, and the somewhat rigid requirements which the committee thought it best to exact. Their names are Albert Victor Bleininger, of Cleveland, O., Otto Hensel, of New Ulm, Minn., and John Carroll Adams, of Lynchburg, Va.

The tests which have been applied to these young men have resulted in the selection of Mr. Bleininger, he having received the highest grades, both on the score of variety and excellence of practical experience and on his scholarship. In the latter respect his total grade was the highest, though by a very narrow margin, Mr. Hensel making a close second and being only a fraction of 1 per cent. the lower. The latter will therefore receive the appointment of alternate to succeed to the position in event of Mr. Bleininger's sickness or other disability.

It is also possible at this time to inform the members of the Association as to the results of their recent ballot on the list of

3—Efflorescence in drying and burning..	22	25
4—Drying properties of clays.....	18	23
5—Scattering topics	8	..

Total vote119

Mr. Bleininger will therefore take up, under the direction of the committee, a full and complete investigation of the effects of structure on the wearing power of paving brick, including not only the stiff mud variety, but also those made in all other



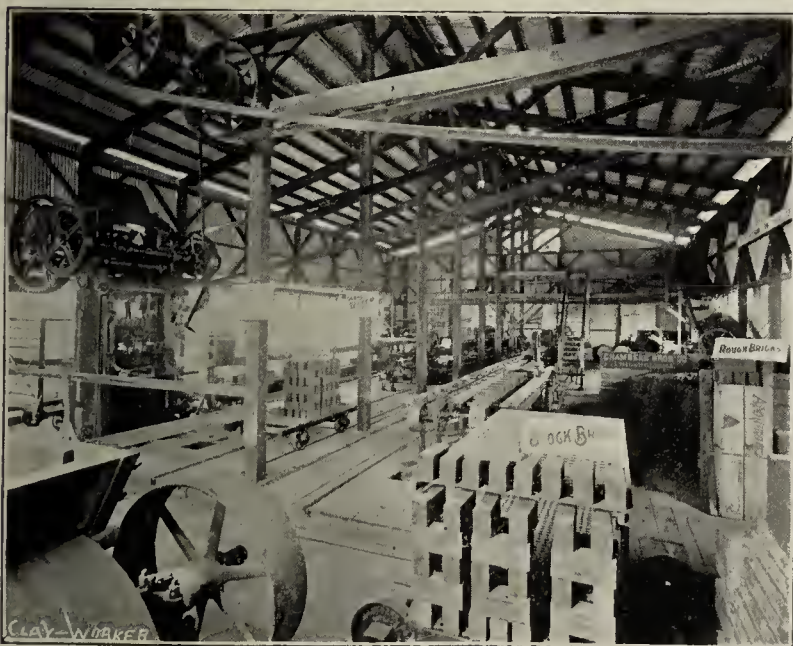
ALBERT VICTOR BLEININGER, Cleveland, Ohio.

ways. This work will be in direct continuation of part of the work reported at the Buffalo meeting by the Commission on Paving Brick Tests, and will supplement, and, it is hoped, settle, the more important of the points left in dispute along that line. It is probable that the committee will be able to furnish a more detailed statement of the work to be undertaken, and of other points to be considered in this connection, in the next issue of the Clay-Worker.

For the benefit of those who may not have been noting the announcements made in previous issues by the committee, it may be stated that the appointment of Mr. Bleininger to this scholarship gives him a salary of \$200 for one school year and exempts him from all fees. During this period one-half of his time is to be devoted to the work of the N. B. M. A. and the other half to studies in any department which he may elect. Very respectfully submitted, EDWARD ORTON, Jr., Chairman and Secretary Committee on Technical Investigation, N. B. M. A.

TEXAS TO THE FRONT.

The Green & Hunter Brick Company, of Thurber, sixty miles southwest of Fort Worth, Tex., is beginning to loom up, and will, when completed, be one of the largest and finest brick plants in the South. The company is putting up acres of sheds and buildings, everything of the very best. Up to now about fifteen cars of machinery, mostly from the Ross-Keller Brick Machine Company, of St. Louis, have been received. Two hundred men, and carts and wagons innumerable, are at work. This plant will make the very finest pressed brick and street paving brick, with a capacity of 100,000 of each kind per day, and judging from the samples now at the office of the company Texas will soon have the finest building material as well as that for street construction to be found in the United States. The company is building the Grath down-draft kilns, of 200,000 capacity each, and as it mines its own coal right on the ground, with plenty of cheap wood and labor, the great success of the enterprise is assured. Col. R. D. Hunter, the leading spirit in this enterprise, says: "Northern cities have been annually shipping ten million brick to Texas, and the freight rate from the nearest point of supply—St. Louis—is \$13.75 per thousand brick. We have the finest shale on the continent, and have purchased the finest machinery made to work it, and it is our intention to stop this influx of brick from Northern cities. We will give our people better brick than they have ever had before, and save them the immense sums paid out for freight." Texas is proud of Mr. Hunter and his immense brick plant, and later on we will notice it more fully.



Interior of Chambers Bros. Co's Exhibit. See page 536.

subjects which shall form the theme of investigation to be undertaken by the recipient of this scholarship. The following table shows the results of the ballot:

Topics.	1st Place.	2d Place.
1—Structure of paving brick.....	47	14
2—Hardness and frost resistance.....	24	34

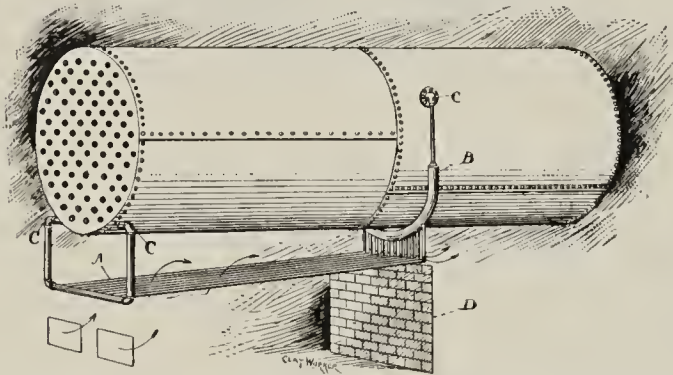


THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Has Any One Tried It?

Editor Clay-Worker:

The accompanying rough sketch of down-draft water grate boiler was suggested to me by a friend, and as I have neither seen nor heard of anything like it, will send it to you for inspection. It is a demonstrated fact that down-draft will work where fire is not crowded, and also that it will burn the smoke. In this instance both up and down-draft are combined, as firing is done as on ordinary grates. The fire is kept pushed back and fuel added in front. This forces the smoke and draft down through live bed of coals and completes the combustion. As it is known that clinkers and cinders will not stick to pipes with water in them it will not be necessary to "clinker out,"



Boiler Setting. A Water grates, B Cast Header fitting lower part of boiler; C Water connections; D Fire brick wall.

but just keep from getting too heavy a bed of coals by occasionally stirring so fine cinders will work through grates. Theoretically this seems all right, but if any of your readers have tried it they can tell where the trouble lies. It will surely be a great steamer, as a large surface is exposed to full benefit of fire. It is suggested that one-inch extra heavy pipes be used, with half-inch spaces. The first thought is filling these pipes with lime, but the circulation through them should help this, and, should they last only a year or two, would not the saving in fuel pay it, as, when threaded right and left, it will take but a few minutes to put them in? Has any one tried it?

A SUBSCRIBER.

The Situation in Chicago.

Editor Clay-Worker:

There has not been a time during the ten years past when building operations have been at as low an ebb in Chicago as at the present. The city records show that building permits were issued in May for 435 buildings, with a total frontage of 11,337 feet and an estimated cost of \$1,621,090. Comparing these figures with those of May, 1896, there is found to be a decrease of 184 buildings, with a frontage of 4,066 feet and \$850,395 in cost. The decrease in May, 1896, compared with May, 1895, is found to be \$2,095,645, which shows a decrease in May, 1897, of \$2,946,040 over that of May, 1895. I think it is safe to place the building permits of May, 1895, as a fair average for Chicago, and it is easy to understand now depressing the present conditions are and how little there is of encouragement in them for those whose interests lie along the line of the sale of materials and the construction of buildings.

The building permits issued this year thus far have been for structures—with few exceptions—of small dimensions and of small cost, including little else than dwellings and small apartment buildings. While facing such conditions and figures as those indicated above, which are so well calculated to depress us, there is still in the minds of many a hope bordering on

a confidence that there is to be a change and an improvement. Real estate and building were the last businesses to be affected by the hard times, and they will be the last in the list, probably, to start on improvement. There will be a start, and all along the line there will be an advance.

How prices are to be put back where they will give the producer a fair margin of profit is a question easily asked, but hard to answer, and making answer to show how such advance is to be brought about exceeds the ability of the most profound and deepest thinkers and students of the situation. With a capacity for manufacture far in excess of the requirements of the best days we have ever had, and large stocks on hand with nearly all makers of pressed and common brick, it is hard to say how prices that will be at all remunerative are to be restored.

While the low prices of clay products have been most discouraging to manufacturers and dealers in these lines, and it has seemed that prices could not go lower, there has been a large increase in the proportion of stone fronts put in, and the prices that have obtained in stone have been so low as to be very demoralizing to the makers and dealers in front brick.

Perhaps a few facts as to prices may not be lacking in interest to your readers. Red brick that two years ago sold for \$22 per thousand are now delivered at building sites at from \$10 to \$12. Buff brick that at the same time sold for \$23 now bring \$14 to \$16. The best quality of fire clay speckled Roman, that formerly sold for \$30 to \$35, now go as low as \$21. All these prices include delivery and 5 per cent. cash discount on delivery prices.

During the last year second quality pavers have been used in Chicago for building purposes to quite an extent. In some cases the artistic effect has been quite satisfactory and pleasing. The most important building in point of size in which this class of pavers has been used is the Home of the Friendless, C. H. Frost, architect. The building covers a large area, and is situated on Fifty-first street, facing Washington Park. It is four stories in height, with high gables and roofs, and, viewed at a little distance, the effect is good. These paving brick are sold at very low prices, ranging from \$9 to \$12 per thousand, subject to 5 per cent. cash discount.

Mr. Geo. B. Engle, Jr., who, about one year ago, made a business connection with the La Salle Pressed Brick Company and became their representative here, has severed his connection with that company. Mr. Engle will remain a factor in the brick market of Chicago, where he has been engaged in the sale of front brick and roofing tile for more than ten years, and for the greater part of which time he was the active member of the firm of Geo. B. Engle, Jr., & Co. TEMPERED CLAY.

Chicago, June 10, 1897.

Water on Red-Hot Clay Ware.

Editor Clay-Worker:

While the discussion about fire-proofing materials was going on at the Buffalo Convention a remarkable experience with gas retorts came to my memory, and I was urged to bring it before the meeting, but, as it was of such a personal character and as I had no data with me, I thought best to defer it. I disclaim any self-praise in this matter, and it is because I believe that any well-made retorts would have stood the same test of sudden cooling, that I consider these two almost identical incidents of great value as facts in this discussion of the merits of fire clay fire-proofing. The following is a circular letter issued by Waldo Bros., of Boston, as an advertisement, but the extracts from the papers referred to can be verified, and the facts are familiar to most of the old gas engineers of this country:

"THE RICHMOND FLOOD.

"57 Kilby Street, Boston, Jan. 23, 1873.

"Dear Sir—We beg to send you a copy of an article that appears in the American Gas Light Journal of Jan. 16, 1873.

—"A Gas Works Submerged.—"

"Mr. Editor—The writer, an old gas man, was passing through the city of Richmond, Va., a few weeks ago, and, having read in the newspapers voluminous accounts of the great flood in the James river, concluded to stop to exchange salutations with friends connected with the gas works and inquire what damage was done them by the irresistible flood of November, 1877.

"It was the greatest in a hundred years, and from which, for many years to come, the people of the James river valley will remember notable events as occurring before or after 'the year of the great flood.'

"At the gas works I found the energetic and courteous Su-

perintendent, Mr. Jno. P. Knowles, and all his men, busily engaged in cleaning up and repairing the damage caused by this mighty force of nature.

"I am indebted to Hon. John M. Higgins, the enlightened Chairman of the Gas Committee, Mr. Knowles and some of his assistants for the information I received, which, I think, will be interesting to the readers of so valuable an organ of the gas interest as your Journal.

"On the 24th of November Mr. Knowles was informed by telegraph from Lynchburg that the waters of the upper James river were rising with unprecedented rapidity by reason of the heavy rains in that part of the country. He, having acquired valuable experience by the freshet of 1870, at once began to prepare for what he believed was coming, by giving orders, in no uncertain sound, to remove everything movable at both the works (upper and lower) that the water might injure or carry away; he also had the caps taken off the stand pipes of all the retorts in action, and had the decks cleared generally for the worst that might come. The wisdom of this course was plainly seen, for before the preparations were entirely completed the water came rushing into the lower part of the city and gas works so rapidly that it soon rose to a height of ten or fifteen feet in the neighborhood of the works, and the officers and men were soon compelled to attend to the duties of the occasion in boats, and continued to do so till 'the dry land appeared.' 'It was a curious sight to see men rowing boats all round the yard and in the retort houses.'

"The entire works were submerged, and by 2 o'clock on the morning of the 25th all the fires were drowned out and the water was soon above the top retorts in benches of 'fives.' The hands relate with curious interest that strange 'crackling' and miniature explosions took place as the water gradually rose in the red-hot furnaces round the heated retorts. The noise, they say, was continuous, and could 'be heard a block off until the ovens were nearly stone cold.'

"The water began to subside on the night of the 26th, and on the morning of the 27th, at 7:30 o'clock, having fallen below the grate bars, the order was given to fire up, and in thirty-six hours the heats on the retorts were sufficient to charge them. This being done, every one expected to find the retorts cracked and leaking by the sudden contraction to which they had been subjected. What will interest our gas friends most is the fact that notwithstanding the retorts were cooled and heated in the time and manner stated, not one was broken or seriously cracked, and at the present time are doing ordinary service.

"Men less bold than Mr. Knowles would have hesitated before pushing matters so promptly. It was a dernier resort, however. There was the city of Richmond and its valuable interests jeopardized by utter darkness at such a time. Two or three miles of the largest mains full of water, and the retorts as cold as death. The doctors say 'heroic treatment' is sometimes necessary, and in this case won; for, in thirty-six hours after the furnace fires were lighted, the citizens of Richmond were lighting their gas with an unexpected pleasure that they had never dreamed gas capable of inspiring. Here I would add, by way of moral, 'We never know the value of the water till the well goes dry.'

"Many incidents were related which, if told as they were told to me, would make an interesting story without the aid of fiction. Fear of trespassing on your space forbids, and I will only mention two:

"When the benches began to warm up, a moccasin snake, more than two feet long, crawled out of one of the stopper holes, and was killed on the floor by one of the men. A wild goose was captured swimming in the yard of the upper works.

"Mr. Knowles attributes the safety of his retorts to the removal of the caps on the stand pipes, thereby preventing steam pressure or explosions within.

"The gas works are owned by the city of Richmond, and the fact that gas of excellent quality is sold at \$2.50 per thousand, and more than \$50,000 of the earnings of last year was profit to the city, and went into the city exchequer to help to defray general expenses, shows that the committee and superintendent who manage the works understand their business.

"Philadelphia, Dec. 28, 1877.

"As we knew that our retorts had gone through the same experience, with the same results, during the freshet in Richmond of 1870, we wrote to ascertain if the 'Hicks Standard Retort' had again stood such a trial, and we are to-day in receipt of the Baltimorean of Jan. 19, 1878. It has the following in its news columns:

—"Correspondence from Richmond, Va.—Baltimore-Made Gas Retorts—How They Stood the Test of the High Water.—

"Richmond, Jan. 18, 1878.

"Editors Baltimorean—One of the results of the late freshet was to establish the superiority of the gas retorts made by the firm of Messrs. Geo. C. Hicks & Co., of your city. Notwith-

standing they were entirely submerged for several days, they seem to be now as hard and firm as if water had never touched them. Their remarkable preservation under the circumstances has been a subject of comment on the part of many gentlemen, long familiar with gas works in various portions of the United States, who have visited Richmond since the great freshet."

Well-burned and well-made fire clay materials, while they are at a red or higher heat, will stand the shock of cold water thrown on them without serious injury. The very intense force of high heat is required to harden fire clays, and they become tough rather than brittle, as impure clays do, which clays harden under lower heats from the fluxing of the impurities they contain. Glazes like Albany slip and feldspar require high heats to fuse them, and they craze the least. They are consolidated with great force. Fire clays expand and contract less than impure clays, and are less liable to fracture under sudden shocks from changes of temperature. Of course, there is a great difference in fire clays, and careful manipulation is necessary to produce homogeneous bodies, but, other things being equal, it seems that fire clay fire-proofing must be the best.

GEO. C. HICKS.

Down in Jersey.

Editor Clay-Worker:

The outlook in Jersey is about the same as two months ago. All the factories are doing something. The hollow brick factories seem to be the busiest.

During a visit to the Staten Island Terra Cotta and Lumber Company's plant at Spa Springs, last week, we found our old friend, James Toomey, still at the head of the terra cotta and faney brick department, but not as busy as he wishes to be. There are about four hundred men employed in all departments now. The sewer pipe department is closed down entirely. Mr. Toomey has taken to the silent steed. We have not learned as yet how many "headers" he has taken. James being so sedate and tall, we imagine he must be compelled to raise the seat post up in the air several degrees to keep his pedal extremities from dragging on the ground. As the road from Amboy to the factory is a nice, smooth macadam road, we predict some high speed when our friend becomes a little limbered up.

The M. D. Valentine Bros. Company, fire brick manufacturers, are running both their factories along steadily. These gentlemen are perhaps the best known of all fire-brick makers in New Jersey, having started in business many years ago. Their works are kept running all the year round, whether business is dull or not.

The old Perth Amboy Terra Cotta Company has been experimenting with a boiler arranged to use the waste heat from the terra cotta kilns with which to make steam. I believe, so far, their principal trouble is they have not enough kilns attached to furnish continuous heat. Otherwise it works fairly well.

The C. Pardee Works are making hollow brick at a pretty fair rate of speed. This firm has recently purchased a tract of clay land up the Raritan river, expecting to mine its own fire clays.

At the Standard Hollow Brick Works four new down-draft kilns have recently been built. Brother Lyle has promised us data for a description of this large plant. We have some photos of the works, and only await his data. This is without doubt one of the best arranged plants in the State for the manufacture of hollow brick.

Keasbey & Weber are running Ostrander's Fire Brick Plant steadily on short time, four hours per day, so we understand.

Building is not as brisk in this city as last year, but still considerable is being done.

We note in New York city many old buildings being torn down to be replaced by new ones. There are four within a single block on lower Broadway. This should make a demand for clay products.

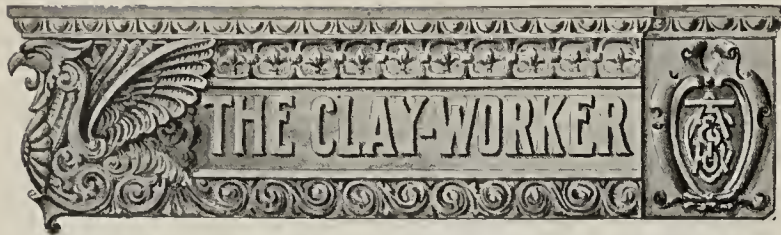
Prices for common brick are about \$5.75 per thousand, delivered at buildings in town.

The Standard Terra Cotta Works, of this city, are quite busy, and employ about one hundred hands.

Perth Amboy, N. J., June 6.

W. R. O.

Mrs. Bellamy Storer, of Los Angeles, Cal., devotes a great deal of time to experimenting in glazes for pottery. She has recently completed her experiments on a new glaze, which has been obtained by very costly and elaborate experiments. The lady has a gas kiln at her home, and works constantly at her experiments. The new glaze is a dull effect of color, leaning somewhat to the iridescent, with curiously mottled effects. It has exquisite spots of color and a texture almost like fur, the latter being a most wonderful quality.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVII.

JUNE 1897.

No 6.

CURRENT COMMENT.

Mr. Waplington closes his series of instructive papers, entitled "Chemistry for Clayworkers," with this issue. No subject is of more importance to our readers, very many of whom, we are sure, appreciate Mr. Waplington's contributions very highly, and will rejoice to know that he will continue on our staff of regular contributors.

* * *

We congratulate Mr. Bleininger on his success in securing the first free scholarship in the Ceramic Department of the Ohio State University, also the members of the N. B. M. A., for their interests could not be placed in better or safer hands. Professor Orton advises us that Mr. Bleininger is one of the most industrious of his pupils, and we know that he is not only capable, but deserving of the honor.

* * *

The fire fiend is abroad in the land, and just now, it seems, is partial to brick and tile plants. The press reports indicate very heavy losses, and generally close with the announcement, "No insurance." This is distressing, but there seems to be little or no hope for relief so long as brick and tile factories are built largely of wood. The wise clayworker builds of brick, and in this way protects himself, and thus is enabled to get insurance at reasonable rates.

* * *

A New England reader, who evidently takes a very serious view of things generally, in a personal letter to the editor, refers to Mr. Purington's letter in our May issue and the editorial comment on same, in which we intimate that he has been placed on the government's pension list, and seems much surprised that a gentleman of Mr. P.'s standing and means would accept a pension, and expresses very positive opinions on the subject not at all complimentary to able-bodied pensioners. Lest some other unsophisticated reader takes a similar view, we

wish to say that the pension part of the matter was intended as a joke. Colonel Purington is not a pensioner, though, as his friends know, some to their sorrow, he is a joker, and enjoys a bit of fun thoroughly, whether he is the joker or the jokee. Knowing this, we felt at liberty to treat the matter lightly. Our New England friend should by all means learn not to take such things too seriously.

* * *

During the past few months we have been called upon to chronicle the deaths of an unusual number of those prominently identified with clayworking in earlier years. Prominent among these are J. W. Penfield, of Willoughby, O., J. C. McKenzie, of Adrian, Mich., and Henry Wiles, of Grassy Point, N. Y. And now comes the announcement of the death of the pioneer clayworker and writer, Mr. J. W. Crary, at Bluff Springs, Fla. This is a remarkable mortality, and we trust will not be repeated.

THE KICKING HABIT.

We do many things by force of habit. Even our growling about business conditions is largely a matter of habit. Most of us are good fighters for business when all the conditions are favorable. With cause for discouragement not a few lay down. In many instances we overwork the idea of buying cheaply, and are not fully appreciative of the fact that the spirit that leads us to buy cheaply makes it necessary for us to sell in the same way. Many of us think that we are conservative, when, as a matter of fact, we have only lost our spirit; we have lost our business energy. We are afraid to let go of a dollar for fear we will never see it again. If one will look over the field of brickmakers and manufacturers of clayworking machinery he will not find the man who boasts of his conservatism, who holds tightest to his dollars, the one who is making money. One of our most progressive manufacturers went to Nashville, and made an exhibit of machinery which cost from fifteen to twenty thousand dollars. Some of his competitors and friends said: "Do you not think you are going in pretty deep for these hard times?" The answer was: "It's your kind of talk which makes hard times. You are so slow that you scare people out of buying from you. We are in the business of selling machinery. While we have put out a good deal of money in this exhibit, we expect to get it back, and more, too." He has learned the important lesson that to make money one must spend money.

MID-SUMMER OUTLOOK.

In its monthly resume of passing events, the Clay-Worker has still to record a steady but certain improvement in the business world—not such, of course, as those look for who wish to suspend the law which is older than the Mosaic institution, which requires industry and economy as the only road to wealth and happiness, nor such as will satisfy those who believe that all the commercial ills we are suffering have been brought upon us by vicious legislation, and can be remedied only by some act or acts of Congress, but such as insures reasonable returns on labor and capital wisely expended. Men who have gone to work at the best wages they can get, adjusting themselves to the new conditions which improved machinery and the law of supply and demand have forced upon the industrial world, are doing as well as could be expected, if not as well as they want to. One thing is quite obvious—the "thousand and one" industries which promised wonderful results on small investments, commonly called "get-rich-quick institutions," are not as flourishing as they were. Not only are the mourners, whose money has gone down with them, going about the streets refusing to be comforted, but a little company of ex-Secretaries, ex-Presidents, ex-Solicitors, and the like, are waiting for Congress to do something that will give them another job—anything but get down to hard work. That times are not very distressingly hard has been twice shown here within a few weeks by the liberal

patronage the two large circuses have enjoyed. Not a man, woman or child failed to attend for want of funds, so far as statistics show, nor has any one refrained from buying that indispensable article known as a wheel for want of money. Times are improving. Dun, in his latest review, says: "The number of hands employed and the volume of new orders are slowly increasing." And Bradstreet says: "Business is better than it was a year ago." Of course, the man who drove mule-cars and knows no other kind of employment, and wants to know no other, is out of a job since the trolley has superseded the mule as a motor, and business with him and the like of him is dull and is likely to be for some time, but with all others the outlook is hopeful.

CUBAN AFFAIRS.

It is hard to characterize Cuban affairs in the space we must allow to this resume. Evidently Spain is discouraged. Changes in the Spanish Cabinet have not helped to settle the difficulties, but rather to make a settlement more difficult. At one time the tide seemed to demand the recall of the Commander of the Spanish forces in Cuba, but a few days later this seemed to be abandoned, so that at the time of this writing it is difficult to say what is likely to be the result, as to Commanders at least. But nothing has occurred or is likely to occur to change the view of the Clay-Worker as indicated in the beginning. Cuba is to be free from the Spanish yoke, and largely, if not wholly, through the instrumentality of the United States. Blood between us and Spain may not be shed, but the certainty of bloodshed unless conditions are complied with will enforce the practical freedom of the island. It will probably not become an independent nation. It would be cruel to force independence upon it. Hardly a single fitness for independence exists on the island, but the oppression which has so long robbed Cubans of the fruit of their toils must cease. There is less fitness in Cuba for self-government than in Canada, and hence, for her own good, the conditions of autonomy should differ, but the relation of Canada to England suggests the line along which relations profitable to both Spain and Cuba may be effected. The events of the last thirty days have indicated that the intervention of the United States is to be an important factor in this settlement. The investigations of the President into the abuses upon our citizens have clearly given us a right to demand redress. This is more far-reaching than the mere settlement of the individual cases would indicate, and all that is in it will be gotten out of it. This much seems evident, as it certainly is desirable, no movement will look toward the incorporation of Cuba into the United States. We have no place for her. We may be under obligations to see that she is not wronged, but the protection of a waif does not make it a duty or a privilege to bring him into the intimate relations of the household.

THE WAR IN EUROPE.

Nothing has occurred since our late review of the situation of affairs in Europe to shake the confidence of the Clay-Worker in its early forecastings. Open hostilities between Turkey and Greece have been suspended, as every one who has studied the situation could easily foresee must be the case, but peace has not been secured. The brute force of Turkey could not fail to overcome the small physical resources of little Greece, whose moral and intellectual powers are not relatively now what they were in the early ages, but the intervention of "the powers" has not yet forced either Greece or Turkey to accept the conditions of peace the powers have prescribed. Of course, if hostilities are resumed, with no interference from without, but one result is possible—Greece must be blotted out, but not one of the nations which have assumed the guardianship of little Greece and the dictatorship of Turkey can afford to allow this, while mutual jealousies will prevent any settlement that is possible without a more disastrous and general war than the mere skir-

mishes which have taken place. The present hushing of cannon is quite as much an armistice between the several European powers as between Turkey and Greece themselves. It is extremely doubtful if diplomacy can settle the questions which underlie European conditions.

THE WEATHER AND THE CROPS.

This time last year the weather mongers were telling us that we were short several inches in our average amount of rainfall, and many were the conjectures as to what had become of the water, and whether we would ever catch up. We are up and ahead now, and the wonder now is where all this surplus water comes from, and if it will ever stop raining. This surplus of water, with a corresponding lack of heat, finds the middle of June with corn in Central Indiana just coming up. This is a calamity for which the party in power is as much responsible as for other causes of hard times. Evidently, if the corn crop is short, a great many interests must suffer. Business more than pleasure called us into the country a few days ago. Some farmers were replanting; others, on better drained soil, were cultivating the tender stalks just out of the ground, and we had a chance to study two types of temperament. One class was despondent—little use to plow and plant now—and they moved mechanically; the other was hopeful and happy. "I am not responsible for the weather," said one farmer. "It is my duty to plant and cultivate, and I am at it. If August proves favorable, we will have good corn, if we work it well." That man does not know what hard times are, while the other knows no other kind. The June report of the Statistical Department at Washington shows only one-tenth of one per cent. fewer acres of wheat this year than last, and the average conditions about the same, which does not indicate any considerable advance in the price of wheat, especially as the prospects in the British Dominions is even better than last year. So, if the prices of labor and its products are likely to rule low, food will also.

PERSONAL MENTION.

Frank Manson, of the Brick Builder Publishing Company, Boston, after putting in a summer day with us, expresses the opinion that Indianapolis is a "hot" town.

W. R. Cunningham, of the Wallace Manufacturing Company, Frankfort, Ind., paused in a still hunt for an illusive "promoter" long enough to say "howdy" and express the opinion that business is slowly but surely getting better.

H. K. Terry, Manager of the Powhattan Clay Manufacturing Company, Richmond, Va., honored us with his presence early in the month. He is making a tour of the Central and Northern States for the purpose of calling the attention of architects to a beautiful white brick which he is now manufacturing.

Wm. Simpson, of dry press fame, followed in the path of Mr. Cunningham, and gave us but a fleeting glimpse of his handsome personality. He says the Simpson Brick Press Company is fully installed in their new factory near Chicago, in which they are now making all of their own machinery, and hope to do a lot of it.

W. W. Woolley, of Anderson, Ind., occupied our easy chair a little while the 15th. He was on his way home from Martinsville, Ind., where he found relief from serious rheumatic affliction. Martinsville water is a sure cure for this trouble, he says, and he looks it, being again in excellent trim, physically. He, too, reports an improved trade.

W. D. Richardson, who is now managing the brick works of the Ohio Mining and Manufacturing Company, at Shawnee, O., paid us a pleasant visit recently, and left in our sanctum three of the finest pressed brick it has ever been our pleasure to look upon. With such brick the success of the company is assured from the start.

TABLE OF CONTENTS.

Ceramic Embellishment in Architecture	511	A Record for Clay.....	537
The Brickmaker's Graveyard ..	513	Obituary	538
Fire Brick as they are Manufactured in the Counties of Durham and Northumberland, England	515	Buttonhole Talks	538
German Notes.....	515	The N. B. M. A. Scholarship.....	539
The House of Erasmus.....	516	Texas to the Front	539
Aluminum in Clay.....	516	Improved Conditions.....	546
The Discolorations of Front Brick by Soluble Sulphates and the Weathering of Clay..	517	The Use of Porcelain in Architecture.....	548
Way Down in Maine.....	518	American Imports and Exports of Brick and Clay	548
Something about Sewer Pipe.....	520	As Others See Us	548
In Deutschland.....	521	A Suggestion	556
The Development of Hollow Block Manufacture.....	524	Handling Tile.....	556
Chemistry for Clayworkers.....	526		
The New Raymond-Victor Press.....	528	CORRESPONDENCE:	
Truth in Poetry.....	528	Has Any One Tried It?.....	540
Pennsylvania Academy of Fine Arts.....	529	The Situation in Chicago	540
Cheap Brick	530	Water on Red-Hot Clay Ware ..	540
A Small Beginning Makes a Good Ending	531	Down in Jersey.....	541
The Clayworking Industries of Victoria, Australia.....	532	Pacific Coast News.....	546
The New York Market	532	Southern Trade Notes.....	552
Pro and Con	534		
Akron—A Great Clay Center...	534	EDITORIAL:	
Death of J. W. Crary, Sr.....	535	Current Comment.....	542
What is "Good and Workmanlike Manner"	535	The Kicking Habit	542
The Tennessee Centennial Exposition.....	536	Mid-Summer Outlook	542
		Cuban Affairs.....	543
		The War in Europe.....	543
		The Weather and the Crops.....	543
		Personal Mention.....	543
		Editorial Notes and Clippings..	550
		MISCELLANY:	
		It's Warm.....	544
		Bates's Essay on Man	548
		Advertising Pointers.....	548
		Hoo Hoo Hotel.....	548

Index to Advertisements on Next Page.

Books for...

Brickmakers.

"CLAY GLAZES AND ENAMELS,"	Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	J. J. W. Billingsley,	1.00
Mailed, postage free, on receipt of price.		

T. A. RANDALL & CO.,
Indianapolis, Ind.

INDEX TO ADVERTISEMENTS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page.
Hilgeman H. B.	509	The Chisholm, Boyd & White Co.	504
Progress Press Brick and Machine	555	The American Clay-Working Machinery Co.....	549, 574, 575
Ross-Keller Brick Machine Co.....	507	The Fernholtz Brick Press Co..	505
Simpson Brick Press Co.....	506	Whitney, H. O.....	509

Brick and Tile Machinery.

Anderson F'dry & Mach. Wks.....	580	Schoellhorn-Albrecght Mach. Co.....	502
Baird & Son, H. C.....	559	The American Clay-Working Machinery Co.....	549, 574, 575
Brewer, H. & Co.....	556, 578	The Horton Mfg. Co	556
Central Machine Works	560	The Eastern Machinery Co.....	582
Chambers Brothers Co.....	501, 551	The Henry Martin Brick Mach. Mfg. Co.....	581
Chicago Brick Machinery Co	570	The Leader Mfg. Co.....	571
Eagle Iron Works.....	560	The Ohl6 Ceramic Engineering Co.	502
Freese, E. M. & Co.....	577	The Turner, Vaughn & Taylor Co	564
Frost Eng'ne Co.....	576	The Wallace Mfg. Co.....	553, 583
Hensley, J. W.....	558	The Wellington Machine Co.....	547
Kells & Sons.....	559	Williams Patent Crusher and Pulverizer Co.....	508
Means & Co., Jas.....	561	Wiles, A. M. & W. H.....	566
Michigan Brick and Tile Machine Co.....	565	Woolley Foundry & Machine Works.....	572
Madden & Co.....	561	Williams, White & Co.....	571
Newell Universal Mill Co.....	572		
Potts & Co., C. & A.....	579		
Raymond & Co., C. W.....	545		
Stedman's Machine Works.....	566		
Steele, J. C., & Son.....	566		

Brick Kilns and Dryers.

Alsip, S. H.....	567	Reppell, L. H	567
Conley & Wolfe.....	568	Sharer, Geo. W.....	568
Cummer & Son Co, The F. D	555	Swift, F. E.....	560
Eudaly, W. A.....	569	Thalson, A	563
Leary, W. A.....	562	The American Blower Co.....	563
Morrison & Co., R. B.....	569	The Fernholtz Brick Press Co..	505
Pike, E. M.....	563	The Standard Dry Kiln Co.....	510
Phillips, S. G.....	556	Wolf Dryer Co.....	584
		Yates, Alfred.....	554

Brick Yard Supplies.

Arnold, D. J. C.....	573	Phillips & McLaren.....	565
Coldewe & Co., G.....	557	The Atlas Bolt & Screw Co.....	561
Carnell, Geo.....	567	The Buck Machine Company ..	559
Cox, Geo. S.....	563	The Harrington & King Performing Co.....	503
Caldwell, H. W. & Son Co.....	564	The Keystone Brick-yard Supply Company	560
Carmichael, T. W.....	561	The Pittsburg Mineral Screen Company.....	554
Hardin & Church.....	558	Wagoner, M. V. B.....	563
Marion Steam Shovel Co.....	573	Walworth Run Foundry Co.....	554
Mey, F. H. C.....	558		
Mershon & Co., W. B.....	503		
Newton, A. H.....	557		

Miscellaneous.

Associated Trade & Industrial Press.....	562	Jackson, John H.....	562
Balsley, G. S.....	561	Main Belting Co.....	562
Dean Bros. Steam Pump Works	560	Osborne, W. R.....	561
Dover Fire Brick Co.....	559	Ropkey-Mason Engraving Co.	567
Evens & Howard.....	565	Tennille, A. F	562
Hay & Willits Manufacturing Company.....	570	The E. W. Vanduzen Co.....	563
International Correspondence Schools.....	565	The Union Hardware Co.....	567
		The Jeffrey Manufacturing Co.....	562
		The Rockwood Mfg. Co.....	557
		Westbrook & Wells.....	562
		Small Ads., Wanted, For Sale, Etc	

IT'S WARM.

Press me closer, all my own;
 Warms my heart for thee alone.
 Every nerve responsive thrills;
 Each caress my being fills.
 Rest and peace in vain I crave;
 In ecstasy I live, thy slave.
 Dower'd with hope, with promise blest,
 Thou dost reign upon my breast.
 Closer still, for I am thine;
 Burns my heart, for thou art mine.
 Thou the message, I the wire—
 I the furnace, thou the fire—
 I the servant, thou the master—
 Roaring, red-hot mustard plaster.

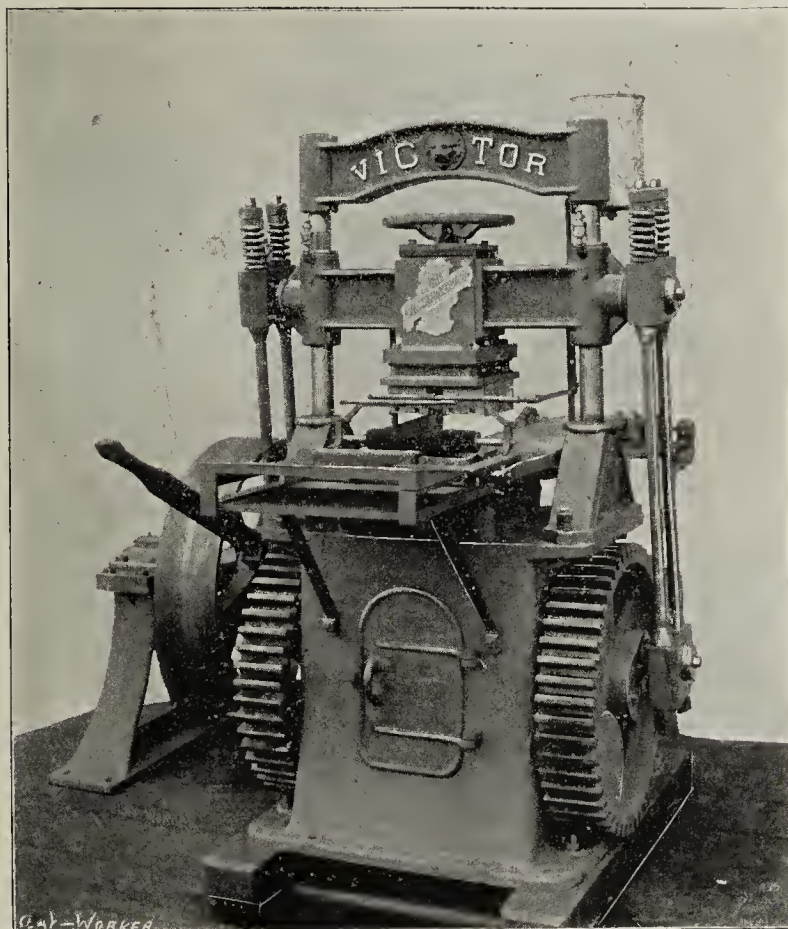
—Printers' Ink.

WILL DO ALL THAT ANY OTHER REPRESS
WILL DO AND A WHOLE LOT MORE.

Raymond's New Repress,

The Raymond Victor.

Simplicity
Reduced
to a
Science.



THE RAYMOND VICTOR REPRESS.

..LOOK AT IT. Isn't it a peach?
Look for cams and springs
and triggers and other instigators
of profanity. You don't see them
because they ain't there. All other
presses have them but the "VIC-
TOR" has not.

...
C. W. Raymond & Co.,

DAYTON, OHIO.

...
Complete Brick Plant Equip-
ment.

PACIFIC COAST NEWS.

The clayworkers in this section report business as very quiet. No buildings of particular importance are in course of construction, nor are there likely to be any for some time to come.

Otto Kleemann, a contractor of Portland, Oregon, has been experimenting with bricks with the view of discovering the best method for rendering them water-proof. He has discovered that bricks, being of a porous and spongy nature, will absorb about one and a half pounds of water each, and the face brick alone on a large building like the Oregonian will absorb about 180,000 pounds of water during a storm of a few days' duration. The moistened outside brick transmit the water to the inner ones at the rate of about five ounces per twenty-four hours by capillary attraction, and keep adding to the weight as long as the face brick are kept wet. In the event of a hard frost following a storm, the ice forming in the pores of the brick is not only apt to chip off small parts and ruin the appearance of the outside, but is likely to cause even more serious damage. The process of drying is very slow, as in bricks with one exposed edge only about an ounce of water is lost in every twenty-four hours. Eight bricks were selected for testing, and the experiments were very exhaustive, the material being tried for its resistance to water, fire and the action of smoke by a slight solution of carbolic acid. The best test seemed to be offered by water glass or silicate of soda, but an acid in the bricks seems to somewhat affect the solution. A still more successful mixture is that of creosote, which produces excellent results. Mr. Kleemann has as yet been unable to find chemicals which will make the silicate of soda indissoluble in water after drying.

J. A. Wiech, of Anaconda, Mont., has located a fire clay claim three miles north of Butte, Mont., near Stringtown. Tests have demonstrated that the clay is of a superior quality for the manufacture of fire brick, and Mr. Wiech contemplates opening up the bed and starting brickmaking operations at once.

The assignee's sale of the Oregon Pottery Company, of Portland, Ore., has been confirmed. A. M. Smith, Jr., bought the plant.

F. H. Goss, of the Union Brick Works, of Tacoma, Wash., has a contract for 1,500,000 bricks for tunnels Nos. 4 and 5, west of the Stampede tunnel, on the Northern Pacific.

Articles of incorporation of the Western Clay Manufacturing Company have been filed at Portland, Ore. The objects of the incorporation are to manufacture brick, terra cotta, sewer pipe, etc. The capital stock is \$100,000, with the following incorporators: Amedee M. Smith, Blaine R. Smith and William H. Britis. The company is to succeed the Oregon Pottery Company, which recently made an assignment.

The El Paso Brick Company has been organized in Albuquerque, N. M., for the purpose of erecting and operating a plant in the county of Dona Ana, N. M., for the manufacture of press, fire and ornamental brick, tile, shingles, terra cotta and other classes of building materials and products from shale clay or fire clay. The principal place of business is El Paso, Tex., and the capital stock is fixed at \$60,000. The stockholders are Noyes Rand, J. H. White, Parker Burnham, J. P. Cottrell, all of El Paso, Tex.; Thomas L. Meyers, of St. Louis, and Edward Rogers, of Alton, Ill. Soil suitable for the making of brick has been discovered in the immediate vicinity of El Paso.

George H. Peck and M. J. McDermott have formed a company in San Pedro, Cal., for the purpose of carrying on a brick business.

K. A. Knapp has a kiln of 60,000 brick in process of firing at Riverside, Cal., and will at once erect another kiln.

The Los Angeles, Cal., Stoneware Company is erecting a two-story frame building to be used in the manufacture of pottery and sewer pipe. The building will cost \$3,000. The officers are: Archibald Douglas, President; W. J. Washburn, Vice President, and James Crichton, Secretary, all of East Los Angeles, Cal.

The contracts have been let for a handsome brick freight and passenger depot for the San Francisco & San Joaquin Valley Railroad, at Hanford, Cal. It is to cost about \$10,000.

The Corvallis, Ore., branch of the Labor Exchange has leased an acre of land, and expects to make brick. One hundred and fifty thousand will probably be burned this season.

The brickmaking industry in San Joaquin county, California, is making rapid progress, and it is said that nearly all the brick which will be used in buildings at San Francisco this year will come from the yards along the San Joaquin river. Eastern capitalists have just bought eighty acres above the old brickyard, and will at once put in a complete and modern brickmaking plant.

The Brickmakers' Protective Association charges that the Rae Building and Contracting Company is using Chinese made brick in the new Mission High School Building, at San Francisco. This is contrary to a law which provides that "no brick made by Chinese shall be used in the construction of any building for which the State or any county or city appropriates money." The organized brickmakers will report the charge to the Board of Education and ask for the annulment of the contract. Chinese made brick run in price from 50 to 75 cents per thousand less than those made by white labor.

The largest single decorative piece of terra cotta to be seen in San Francisco has just been placed in position. It is in the central front panel of Mission Lodge Hall. The panel is nine and one-half feet long and half that distance in height. The subject is the three cardinal virtues of Faith, Hope and Charity at the foundation of the Masonic order. Faith stands to the left, her hands clasped in prayer. On the right Hope stands erect, supported by the symbolic anchor. Charity, the greatest of the three, occupies the central position, and is represented as caring for the orphan. The remainder of the design is a shield, in the upper part of which is the coat of arms of California, and in the lower part the Masonic square, compass, and the capital letter, "G," indicating the Deity.

At a recent "kitchen sale" in Oakland, Cal., the collection of pottery was large and very valuable, owing to its age. The collection contained pieces of Wedgewood, Spode, Copland and Minton, prevalent in the middle of the last century, also some rare old Staffordshire, in blue and white, and pieces of Bow, Lowestoft, Chelsea, and several old English vases. A pitcher made by Daniel Greatbeck, the celebrated designer, in Jersey City, in 1830, was at the head of the group of early American pottery.

C. H. Wallace & Sons, manufacturers of bricks and tiles at Creswell, Ore., have gone out of business. SUNSET.

San Francisco, June 5, 1897.

IMPROVED CONDITIONS.

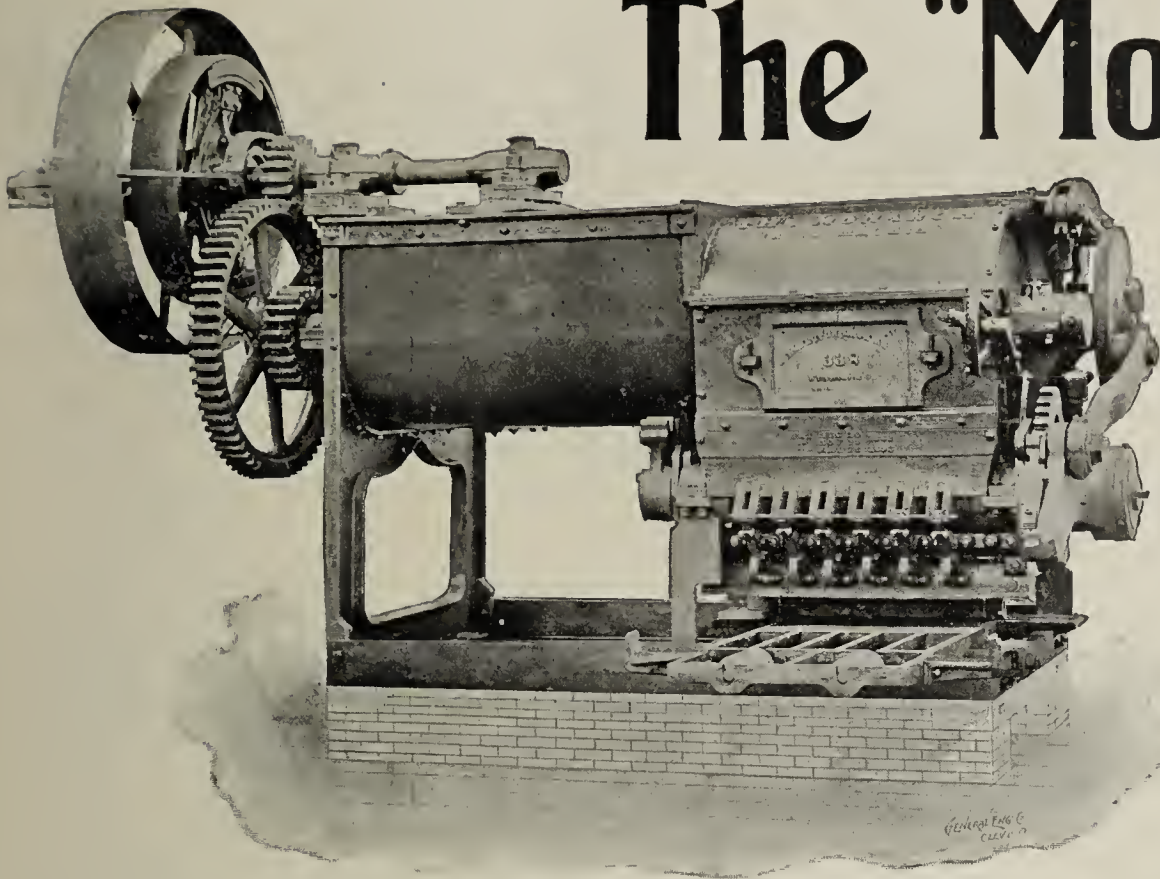
The force of habit which leads us to growl about hard times often continues after the occasion for it has passed, though much that we say has a great deal to do with prolonging the evil. Let no man think the times are not getting better. The commercial agencies affirm this. Jobbers are reporting better business. Trade generally is much better than it was a year ago. Last week the prices of many staples advanced. Bank clearances were more than 7 per cent. better last week than the corresponding week of 1896. A local banker said that he loaned more money last week than during any other week for a year. Gold has practically ceased going out of the country. Stock in the treasury has increased. In New York last week loans were increased nearly two millions of dollars for the very good reason that there were opportunities for its profitable use through the improvement of business conditions. If we will look to these facts we shall be able to find encouragement, and in that way aid in the betterment of things.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

The "Monarch"



(Horizontal,
Double Pug Mill,
Double Press.)

... and ...

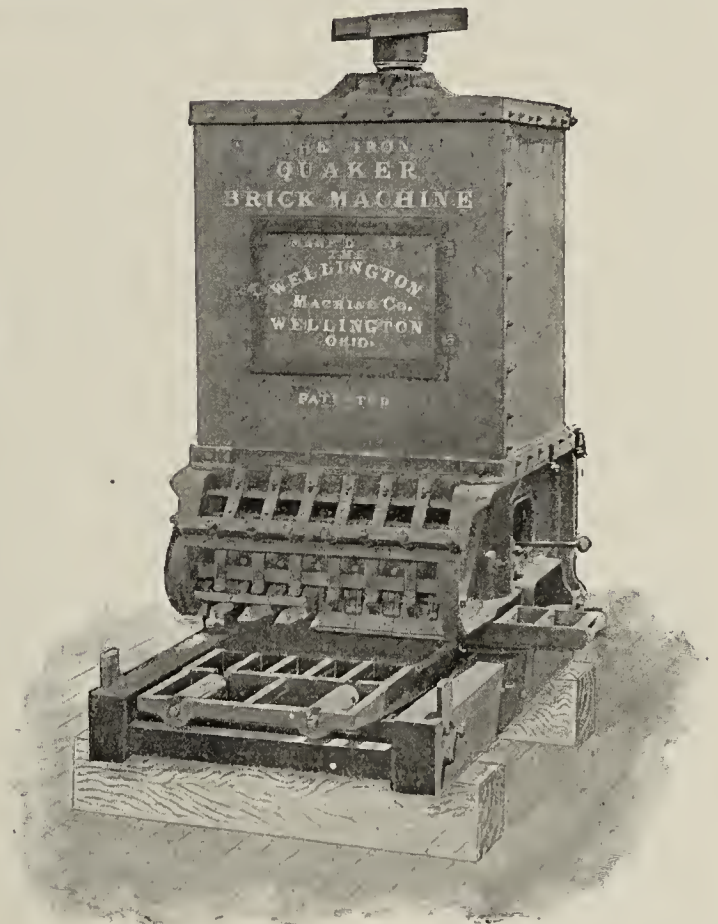
— THE —

"Iron Quaker" Brick Machines

Lead the "Sand=Moulding" Class.

AUXILLIARY
MACHINES
AND . . .
SUPPLIES.

Pug-Mills, Disintegrators, Crushers,
Mould - Sanders, Represses, Winding
Drums, Dump Cars, etc., Moulds, Dump
Tables, Dryer Cars, Kiln Doors and Cast-
ings, Elevators, Dump Carts, etc., etc.



Ball-Bearing Brick Barrows and Trucks.
No one else makes them.

FOR SALE.

Odd sizes of moulds. Have not been used.

5 moulds, $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{8}$. 9-16 inch partitlons.
20 moulds, $8\frac{1}{2} \times 13-16 \times 4\frac{3}{8} \times 2\frac{7}{8}$. 9-16 in. partitlons.
12 moulds $9\frac{1}{8} \times 4\frac{1}{2} \times 2\frac{1}{2}$. $\frac{1}{2}$ inch partitlons.

Second-hand, but used a few days only.

10 moulds, $9\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitlons.
19 moulds, $9\frac{1}{2} \times 4\frac{5}{8} \times 2\frac{9}{16}$. " " "
16 moulds $9\frac{1}{4} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 inch partitlons.
16 moulds $9 \times 4\frac{1}{2} \times 2\frac{1}{2}$. 9-16 inch partitlons.

The Wellington
Machine Co.,

WELLINGTON,
OHIO.

Send
for
Circular.

THE USE OF PORCELAIN IN ARCHITECTURE.

UNDER THE ABOVE TITLE M. Camille Leymaire has devoted much attention, in the *Revue des Arts Decoratifs*, to a subject of much interest at present to the porcelain makers at Limoges. According to our author the use of porcelain in architectural decoration is very ancient. He thinks that facings of faience in which white predominated, so much used in the Orient, are only imitations of facings in porcelain, giving naturally, so to say, effects which are laboriously but ingeniously sought for while using other ceramic materials.

At some ancient period, he thinks, travelers saw in the far East the porcelain architectural decorations, and these observations gave rise to the use of the white facings with the predominant white. There are also imitations of the imitation, and those peoples who were not acquainted with the use of porcelain endeavored otherwise to obtain similar effects, giving rise to the kaolinic pottery, but which may also call for other ceramic materials, like faience, for example.

Hereafter it will be possible to utilize in a practical way the porcelain of the grand feu in architectural decoration, but there will be room for the development of new processes of manufacture not now sought for. As to the application of porcelain in this way, its use now is restricted by certain canons which it will be possible and proper to break away from. Our manufacturers will be able to furnish the materials demanded by the architects as soon as the latter shall have decided to enter upon a course which shall give to the coming century an original art established upon a rational basis. This, at any rate, is the conclusion arrived at by M. Leymaire, who has treated the subject from a theoretical and practical standpoint.

AMERICAN IMPORTS AND EXPORTS OF BRICK AND CLAY.

The following imports and exports of brick and clay are for the month of March, the latest period for which the official figures have been compiled by the Treasury Department at Washington:

The amount of building brick exported in March amounted to 328,000, valued at \$1,885, against 187,000 exported in March, 1896, valued at \$1,246. The nine months' total exports show an increase, being 3,340,000 this year, valued at \$20,647, against 2,900,000 exported last year, valued at \$19,300.

Fire brick was exported from the United States to other countries to the value of \$125 in March, as against \$4,766 last March. The nine months' total shows a gain, being \$82,448 this year, as compared with \$74,910 worth exported last year.

The dutiable imports of clay for the month of March amounted to 10,558 tons, valued at \$73,797, against 10,472 tons imported in March, 1896, valued at \$75,332. The total imports for the nine months this year amounted to 69,963 tons, valued at \$501,359, against 78,753 tons, valued at \$566,409, imported last year.

The dutiable re-exports of clay are shown to be 11 tons in March, valued at \$36, against \$3 worth re-exported in March, 1896. The re-exports for the nine months of this year amounted to 32 tons, valued at \$51, against 44 tons re-exported in 1896, valued at \$559.

Remaining in customs warehouse in March, 1897, were 28 tons of clay, valued at \$260, against 150 tons, valued at \$1,227, in March, 1896.

AS OTHERS SEE US.

Maxted & Knott, consulting engineers, of Hull, England, in renewing their subscription to the *Clay-Worker*, say that Mr. Maxted has just returned home from a short visit of inspection to American clayworking establishments. He visited several large brickmaking plants in the States, and was highly pleased with the cordial manner in which he was received, and requests

the privilege of thanking those who entertained him so pleasantly through our columns. He carried home very pleasant impressions of his American cousins. The character and extent of our great brickmaking plants surprised him not a little. Though an expert in brickmaking machinery, particularly the soft mud process as followed in England, he found many new and novel features here, and promises to give our readers a resume of his trip in the near future. We are sure his observations will be interesting.

BATES'S ESSAY ON MAN.

Man is a very complex animal. He was born with a great many wants implanted in his nature. As the world grew older new wants came to the surface. In many cases—in most cases—he did not know he had those wants until the means of gratifying them were offered. Very often it was through advertising that the means were offered, but that advertising did not create the demand. It merely announced that the time had come when that particular want could be gratified. All the discoveries of science and mechanics belong to this class. In time to come man will find new wants within himself. He will demand things about which he knows nothing now. And then some sophist will arise up and say that the advertising used to announce where these new demands may be supplied has created the demand. Advertising in every instance tells where a demand may be supplied. It never creates the demand. He who thinks otherwise does not know what advertising is. —Charles Austin Bates's Criticism.

ADVERTISING POINTERS.

The man who can get along without advertising is the man who would benefit most by advertising. His goods advertise themselves. Make them known. The wider their acquaintance the more they will advertise themselves.

In writing, in illustrating, and in all things connected with advertising, the supreme excellence is simplicity. Plain language and plain pictures. Plainness does not mean prosiness. Simple words can be made to convey a powerful message. The most artistic pictures are the simplest.

The criticism of advertising which appears in many of the advertising journals, and which would reduce everything to rules, is destructive to the ultimate health and growth of advertising, for it gives the advertising beginner the impression that success can be attained by following certain directions, when, as a matter of fact, it is achieved only by allowing one's individuality and judgment full play.—*Printers' Ink*.

HOO-HOO HOTEL.

C. W. Hill, who runs a strictly Hoo-Hoo hotel at Antigo, Wis., has issued the following rules for his guests:

"Board, \$50 per week; meals extra.

"Guests are requested not to speak to the dumb waiter.

"Guests wishing to get up without being called can have self-raising flour for supper.

"Guests wishing to do a little driving will find hammer and nails in the closet.

"If your room gets too warm, open the window and see the fire escape.

"If you're fond of athletics and like good jumping, lift the mattress and see the bed spring.

"If your lamp goes out, take a feather out of the pillow; that's light enough for any room.

"Any one troubled with nightmare will find a halter on the bed post.

"Don't worry about paying your bill; the house is supported by the foundation."—*West Coast Lumberman*.

The Keystone Brickyard Supply Company, Lancaster, Pa., make a specialty of brick and tile trucks, barrows, molds, etc., as will be seen by turning to their ad. on page 560. They say their supplies cannot be beat and that their prices are way down. Write them for particulars, mentioning the *Clay-Worker*.

To All Whom it May Concern.

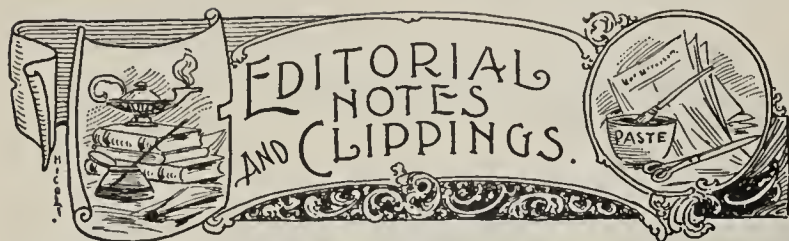
The American Clay-Working Machinery Co.,

**Replies to the Chambers Brothers Company's Circular in
Reference to Decision in Patent Suit for Infringe-
ment against J. W. Penfield & Son.**

Please Read Carefully.

 AMERICAN CLAY-WORKING MACHINERY COMPANY, of Bucyrus and Willoughby, Ohio, takes pleasure in informing the trade that all of their modern, best and most important brick machines are entirely unaffected by the decision in the case of Chambers Bros. Co. vs. J. W. Penfield & Son. The circular of the Chambers Brothers Company calling attention to this decision in the case is likely to deceive the unwary. Attempt was made by Chambers to have his endless belt cut-off patents Nos. 297,671 and 297,917, broadly construed to cover all revolving cut-offs. This the Court refused to do, and held that the Penfield Machine did not infringe those claims of the two earlier patents. One machine formerly made by J. W. Penfield & Son was held infringed upon patent No. 362,204, but this is an old style machine. None of that class have been built for the last three years. The American Clay-Working Machinery Co. manufactures and sells to the public Cutting Off Machines under the authority and protection of the O. W. Johnston patent No. 478,346, and the John Thompson patent, No. 496,286, which have not been attacked in the Courts by anybody. It is conceded by Chambers Bros. Co. that our primary wheel-cut-off machine, manufactured under Patent No. 391,698, sometimes called the French cut-off, ante-dates their patent. This machine we manufacture and are now offering to the trade. In addition to the cut-off tables manufactured under the Johnston patent, No. 478,436 and the Thomson patent, No. 496,286 and Frey patent No. 391,698, we manufacture the Automatic Side Cut-off, the Semi-Automatic Cut-off, the Hand Cut-off, the Combination Cut-off, the Galesburg End-cut Machine and the Frey Wheel End Cut-off Machines. Also machines so arranged as to work satisfactorily, either for end-cut or side-cut brick—none of which are claimed to infringe the Chambers patents. It is not disputed by any one that the American Clay-Working Machinery Co. owns and controls the fundamental patents on this side-cut-off class of machines. Their superiority over the end-cut machines of the Chambers class is too well known and recognized by brick manufacturers to need further comment. Our legal counsel, Messrs. Wood & Boyd, of Cincinnati, Ohio, advise us that our present machines are not infringing any of the claims involved in the Chambers suit. We believe their advice to be sound—therefore we guarantee all parties purchasing and using brick and tile cut-off machines made by us, to hold them harmless from all loss, costs or damages by reason of any alleged infringement of said Chambers patents.

THE AMERICAN CLAY-WORKING MACHINERY CO.,
BUCYRUS, OHIO, U. S. A.



W. T. Boone contemplates the erection of a brick plant at Brashear, Mo.

M. W. Russell, 145 South Broadway, Dallas, Tex., wants to purchase brick machinery.

Wm. Busby and Henry Holt will manufacture brick at Newtown, Mo., this summer.

L. E. Aldrich, Bluefield, Nicaragua, C. A., would like prices and catalogues of brick machines.

W. C. Swandick has leased the brickyard at Chester, Ill., and will operate same this summer.

Geo. C. Peck and M. J. McDermott will organize a company to manufacture brick at San Pedro, Cal.

The Rodgers Brick Works have been chartered at Union, S. C., by Jas. H. Rodgers and P. M. Cohen.

Baker, Cavanaugh & Co. have sold their brickyard at Willmamssett, Mass., to the Holyoke Brick Company.

Elliott & McCormick have formed a partnership, and will manufacture brick at Carman, Manitoba, this summer.

The plant of the Eureka (Ill.) Brick, Tile and Electric Company was slightly damaged by fire the first of the month.

P. H. Cohen, of Hamilton, Mont., has secured a contract for 1,000,000 brick for a new university to be built at Missoula.

C. E. Angell, New Orleans, La., is in the market for T rails and brick cars. He will build a new drier at his brick plant.

Ebaugh & Johnson's brick plant, at Seymour, Ind., burned to the ground on the 1st inst. The loss is estimated at \$2,000.

The Galesburg (Ill.) Paving Brick Company sustained a loss of \$500 by fire recently. About eighty feet of kiln sheds were burned.

The kiln sheds of the Dickson Brick Company, at South Dickson, Tenn., were damaged to the extent of \$100 by fire, on the 3d inst.

The Buffalo Star Brick Company, whose works are located at Lancaster, N. Y., have resumed operations, after being closed down for ten months.

The Little Rock (Ark.) Brick Works have been incorporated by Geo. A. Leiper, S. M. Apperson and Eben W. Kimball, with a capital stock of \$30,000.

Edmund Trudell has leased the brickyard formerly operated at Exeter, N. H., by Swallow & Dunn, and will manufacture brick on a large scale this season.

J. W. Shackelford has purchased his brother's interest in the tile factory at Maxwell, Ia., and will carry on the business hereafter on his own responsibility.

August Prodoehl, an employe at the brickyard of E. Chase & Sons, Milwaukee, Wis., was caught in the machinery on the 6th inst. and badly crushed, dying almost instantly.

The brickyard of John Burnett, Lake Charles, La., was almost totally destroyed by fire on the 4th inst. Mr. Burnett carried no insurance, and estimates his loss at about \$6,000.

Capt. Halvorsen has purchased a half interest in the Sheboygan (Wis.) Brick and Tile Company's plant, H. Meyers, the President of the company, retiring on account of poor health.

R. Montgomery has his new brick plant at Ogdensburg, N. Y., almost ready to commence operations, and by the time the June Clay-Worker reaches him he will be working full force.

F. Y. Banker is enlarging his drying capacity at his plant at Greenfield, Ind. He hopes, when his new drier sheds are completed, to be able to meet the increased demand for his brick.

The Mountain State Brick and Tile Works, Point Pleasant, Va., has been incorporated, with a capital stock of \$100,000. Jos. Hein, C. F. Hess, Jas. F. Neighbors and H. Keisel are interested.

The Halcyon Brick Works, located at Black River Falls, Wis., have resumed work after an idleness of six months. Mr. Bright, the proprietor, says they have orders ahead from all over the State.

The Chatham Machine Brick Works, located a short distance from Savannah, Ga., were completely destroyed by fire the

night of June 1. The proprietors, E. F. and R. P. Lovell, place the loss at about \$10,000, on which there is no insurance. They will, in all probability, rebuild.

A. M. Pence, of Lincoln, and W. Greening, of Hustonville, Ky., have formed a partnership for the purpose of manufacturing brick at Lincoln. They expect to have a daily capacity of 25,000 brick.

M. M. Stoddard, who formerly owned the bulk of the stock of the Villisca (Ia.) Brick and Tile Company, has sold his interest to F. A. Parsons, of Rago, Kan., who will move to Villisca and take active charge of the business.

The large brick and tile factory of Smith & Wineland, Bloomdale, O., which has been closed down for the past year, has resumed operations. They say they have on hand sufficient orders to keep them running an indefinite length of time.

The plant of the Morrison-Trammell Brick Company, at Rome, Ga., is a busy place these days. They are turning out between 30,000 and 50,000 brick daily, and are selling them, too. This is the company of which R. B. Morrison is General Manager.

R. Matson, Sons & Co., at Fall Creek, Pa., are running their plant to its full capacity. They are now making preparations to manufacture hollow building brick in addition to common building. They have had a growing demand for this ware, and have decided to supply it.

A. W. Morgan, Superintendent of the Chicago and Minonk Coal and Tile Works, was beaten and kicked to death June 9, in a riot which occurred among the miners employed by the company, who had been out on a strike since May 1, and one of the employees, Jno. Vetoski, was shot by Mr. Morgan and instantly killed.

The brick mold manufacturing firm heretofore known as Hardin, Bailey & Church, located at Freeport, Ind., has been dissolved by mutual consent. All the accounts of said firm will become the property of W. M. Church and R. E. Hardin, who will assume all indebtedness and continue the business under the firm name of Hardin & Church.

Wm. H. Weaver, of the firm of Weaver & Harman, who has manufactured brick at Baltimore, Md., since 1877, died at Lauraville, Md., May 31. His death was due to cancer of the stomach. Two months ago one of his sons was crushed to death in the clay grinding machinery at the plant. Mr. Weaver leaves four sons—Wm. C., E. E., A. H. and H. A. Weaver.

The Coffeyville (Kan.) Brick Company are very much elated over securing a contract for 1,700,000 paving brick for the streets of Shreveport, La. They say the brick were subjected to a severe crushing test, and stood a test of eighty tons pressure to the square inch. The capacity of the plant is now being enlarged, and they expect to soon be running both a night and day force.

A company has been organized to operate the pressed brick plant at Crawfordsville, Ind., formerly owned by Martin & Son. The officers are: President, A. F. Ramsey; Vice President, A. E. Reynolds; Treasurer, P. C. Somerville; Secretary, W. F. Hulet. M. Halpin, formerly connected with the Tiffany Enameled Brick Company, of Moline, Ill., will be Superintendent, and states that the clay at hand will make as fine brick as can be made in the United States.

The Stamford (Conn.) Fire Brick and Stove Lining Works, one of the oldest of Stamford's industries, has, by an arrangement completed within the last few days, been consolidated with the Brooklyn (N. Y.) Fire Brick Works, which has an extensive plant, covering about a block of ground, on the Erie basin. The arrangement is made in the interest of both establishments. H. A. Perkins, who has for many years managed the Stamford concern, becomes General Manager and Treasurer of the Brooklyn establishment, assuming charge immediately.

East Liverpool, O., is going to have one of the largest sewer pipe manufactories in the United States. This will come about by the enlargement of the already mammoth plant of the Knowles, Taylor & Anderson sewer pipe factory to twice its present capacity. T. F. Anderson, the President of the company, says they have had this improvement in contemplation for more than two years past, and while the enlargement in all its details has not yet been fully decided upon, yet the matter has been thoroughly discussed and practically agreed to by the Directors.

The exhibit of brickmaking machinery at the Tennessee Centennial, Nashville, Tenn., where Chambers Bros. Co., Philadelphia, have erected a building for their own use, and installed about \$20,000 worth of machinery, is in operation and receiving a good deal of attention. This is one of the few exhibits

[CONTINUED ON PAGE 552.]

DECISION IN FAVOR OF CHAMBERS

IN THE

Infringement Suit Against J. W. Penfield & Son

ON

Brick Machine Patents Owned by Chambers Bros. Co.

PHILADELPHIA, PA.

NOTICE

To the Public Generally and to Manufacturers and Users of Wire Cut-off Brick Machines Especially.

After a protracted litigation, in which the defendants, with the aid of able legal counsel, contested every point and raked Europe and America to find something that would defeat our patents, the **United States Circuit Court at Cleveland, Ohio**, in the suit brought by us against J. W. Penfield & Son, has sustained as good and valid all of the essential and important claims in suit covering the endless belt or carrier and the wheel wire cut-off Brick Machines of our basic patents, No. 297,671, No. 297,917, and No. 362,204, besides certain claims for minor features of construction of these and other of our patents.

We are advised by our counsel (Joshua Pusey, Esq., of this city) that all machines constructed or used, without license from us or our predecessors, and operating on the principles of the endless belt or carrier machine of patents Nos. 297,671 and No. 297,917, are infringements of said patents.

Also, that all such unauthorized wire cut-off machines having a rotating wheel carrying cut-off wires and having a cam, or cams, for guiding, or regulating, the movement of the wheel so that the wires will take their proper path through the moving bar of clay in severing the latter into bricks, and means for causing the cut-off wheel to move in unison with the bar, are infringements of patent No. 362,204.

Also, that all such unauthorized machines having in combination with the cut-off wheel and the cam, or cams, a positively driven friction belt, for aiding in driving said wheel, are infringements of the last mentioned patent.

Also, that all such unauthorized machines having endless belts or carriers, or wheels, with U-shaped elastic bows secured thereto, for holding the cut-off wires, infringe, respectively, patents Nos. 297,671, and 297,917, and 362,204.

All manufacturers and users of Brick Machines infringing the said patents and claims of other of our patents that were adjudged to be valid in the case against J. W. Penfield & Son will please take notice that we intend enforcing our rights in said patents and in all others owned by us.

CHAMBERS BROTHERS COMPANY,
Fifty-second St. below Lancaster Ave., Philadelphia, Penna., U. S. A.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

which was ready to "go" on the opening day. One characteristic feature of the Chambers brick machines is that "when the engine starts the Chambers machine makes brick."

George Alsip will manufacture bricks at Ellensburg, Wash., this summer.

E. S. Truitt and W. J. Phipp have established a brick plant at Middle Neck, near Salisbury, Md.

The McAdams Bros. have purchased brick and tile machinery of Shultz Bros., and will utilize it in a new yard at Pandora, Ill.

A new firm, composed of Messrs. Tourigny, Lemay and Pelierin, has been organized at Wolsley, N. W. T., for the manufacture of brick.

The New Coeln Brick and Tile Company has been incorporated at Milwaukee, Wis., by T. Watry, P. J. Huelsbech and Chas. Huelsbech.

E. M. Freese & Co., at Galion, O., manufacturers of brick and tile machinery, have increased the wages of all their employes from 10 to 15 cents per day.

Chambers Bros. Company, of Philadelphia, Pa., have recently erected and started a plant for making hollow brick on the yard of the C. P. Merwin Brick Company, at Berlin, Conn.

By the collapsing of a shelf loaded with brick on a gas jet in the tile and brick sheds of Cole Matelin, at Redkey, Ind., June 13, the entire plant was destroyed by fire. No insurance.

Wm. A. Scott, for many years a fire brick manufacturer of Pittsburg, Pa., died at his home in that city May 23. Mr. Scott was seventy years old. A wife, three sons and a daughter survive him.

The Western Clay Manufacturing Company has been organized at Salem, Ore., for the manufacture of sewer pipe, drain tile, brick, terra cotta and fire-proofing. The new corporation is capitalized for \$100,000.

J. L. Fowler, Mt. Ayr, Ia., writes that he is having a good trade in soft mud brick, and the prospects are good for a splendid business the balance of the season. He contemplates putting in a soft mud machine next spring.

The brick works formerly owned by the Wynn Brick Company, at Blairsville Intersection, Pa., are being enlarged and improved. H. Wynn, the Superintendent, is pushing the work, and wishes catalogues of soft mud machinery and represses.

In a recent letter J. C. Miller, of Upper Sandusky, O., says: "This spring I began to make soft mud brick, using a Monarch machine, which works fine. Am about ready to burn first kiln. Weather has been very wet, making it difficult to dry on yard. Do not think I will have any trouble to dispose of my brick at a fair price. If not, will soon get in good shape for business."

A useful and very interesting book is "A Mint of Hints," just issued by the American Clayworking Machinery Company, of Bucyrus, O. The book is one of the prettiest ever sent out to brick and tilemakers. It is printed in brown and green ink, and is inclosed in a handsomely embossed cover. In this work of art is given a description of the Durant hollow building block and matter showing its superiority as a building material. There is also shown a multitude of shapes and forms of all kinds of brick.

Ira Lampey states in a recent letter that he will start a new brick plant at Eufaula, Ala. He says: "I know nothing about brickmaking, and am going to go slow and find out just where I am before I buy any machinery or anything else, and intend to pay cash for what I buy, and will make brick only. I will want a competent, reliable, sober man to run the yard. The size of the plant, daily capacity, etc., will depend on the result of my investigations, although I have the means to erect any size plant I think will pay me to erect and operate."

John Triplett, of Tupelo, Miss., writes the Wellington Machine Company: "Could you put me in correspondence with some good tilemaker who would like to come South and start a tile factory? We can give some inducement to a party who will start a plant here. Three tilemakers of Illinois have pronounced the clay to be No. 1. We have both tile and brick clay on the Mobile & Ohio Railroad, less than one-quarter of a mile from crossing of two roads. I am in the building business and make what brick I use, but would like to have a brick and tile factory here."

The Williams Pulverizer and Crusher Company, St. Louis, write that they are having a very good trade in clay pulverizers. They recently delivered a pulverizer to the Hydraulic

Press Brick Company, of that city, making the third machine of the kind they have sold this season. The fact that the Hydraulic Press Brick Company find it to their advantage to use this machine is pretty good evidence, Mr. Williams thinks, that it is particularly suited for dry press brick works. From the testimonial letter which is given on page 508 it would appear that others hold the same opinion.

O. J. Swegles, of the Lancaster Brick Company, Buffalo, N. Y., says about 40,000,000 brick will be used in Buffalo this year in buildings and construction of sewers. He says prices never ruled lower in Buffalo than at present. About 3,500,000 brick will be used in the postoffice, 8,000,000 to 10,000,000 in the new armory, 2,500,000 in the Great Northern elevator, 1,000,000 in school No. 18, 2,000,000 in the addition to St. John's Protectors, 2,000,000 in the new Catholic Institute at the corner of Main street and Forest avenue, and 1,500,000 each in sewers in Choate avenue and Dingens street.

The immense plant of the Monmouth (Ill.) Pottery, of which mention was made in the Clay-Worker recently, was partially destroyed by fire on the night of June 1. By hard work the firemen kept the flames confined to the center part of the plant—the operating department—thus saving the large stock rooms and the boiler and engine buildings. The loss is estimated by the officers of the company at \$15,000. The company carried no insurance, but have announced their intention of rebuilding the burned portion of the works, and say they will be running full time again within sixty days. The fire is supposed to be the work of incendiaries.

A rather unique corporation is that of the New Jersey Rock Ornamental Pressed Brick Company, at Jersey City, N. J. They state the object for which they are organized, in the articles of incorporation, as follows:

"The object for which this corporation is formed is primarily and principally to organize and establish an industry where the deserving poor who are trying to live a Christian life may have employment, and

"Whereas, The civil laws of the land or of the United States of America recognize the first day of the week, commonly known as Sunday, as the Sabbath day, or the Sabbath of the Lord, and

"Whereas, Many believe that the true Sabbath of the Lord is the seventh day, or Saturday, and many have conscientious convictions that, in doing any manner of work, they are disobeying the fourth commandment of the divine law, and

"Whereas, Many are suffering persecution for their obedience to the same, and, as employment is difficult to be obtained, be it therefore

"Resolved, That this corporation, in forming its articles of incorporation, do hereby insert as, and it will be one of the articles of incorporation, that it will seek to give to such persons employment as herein described, and also it recognizes the seventh day as the Sabbath day, on which no manner of work shall be done by the corporation through its officers, agents or otherwise in the prosecution of its business."

Rev. Martin D. Hancock, pastor of the Church of the First Born, of Jersey City, is the prime mover in the project. The capital stock is \$20,000.

SOUTHERN TRADE NOTES.

The Monterey Brick Manufacturing Company, of Monterey, Mex., with a plant of 110,000 daily capacity, are running steadily and supplying orders throughout the Republic. They make an excellent article, having a plant equipped with the latest improved machinery.

McGowan Bros.' brick works at Portsmouth, O., have resumed after quite an extensive course of repairs. They make red brick exclusively, and will be able to keep going for some time yet.

So far nothing has come of the options taken some eight months ago by Cincinnati and Chicago parties, represented by Jas. A. Haskell, of Ashland, Ky., upon a large area of fine flint clay lands near Soldier, in Carter county, Kentucky. It was their intention to establish immense fire-brick yards near Soldier.

Preparations are being made at the Coal Grove, O., plant of the Peters Fire Brick Works for the early resumption of the red brick department, the company having secured extensive contracts for this summer. The fire brick plant is idle.

Investigations have just been completed at Sedalia, Mo., by Frank G. Loterer, of Fort Scott, Kan., looking to the early establishment of a brickmaking plant at Sedalia, to have a capacity of 50,000 daily.

Muddyman & Co., of Grayson, Ky., contractors and builders, have located a site for a red-brick yard, with the expectation

[CONTINUED ON PAGE 554.]

Notice to the Public Generally.



WEeping OPINIONS of attorneys are not always the decision of courts, which decisions are usually based on law and evidence, and it does not follow that if a decision is rendered against "Tom" that one will be rendered against "Dick" or "Harry."

Cunningham's Automatic Cutters are protected by Letters Patent Nos. 411,546, 459,719 and 573,263; on which the United States patent office has granted broad claims, two of the principle ones reads as follows:

4. In a machine for cutting brick or other clay products, the combination, with the endless clay-belt driven by a bar or stream of clay, and a shaft having a pulley supporting and rotated by the driven clay-belt, of a revolving support having a series of rock-shafts, provided with attached arms carrying cutting wires, gearing actuated by the driven clay-belt for continuously and positively revolving the support and cam mechanism for rocking the rock-shafts on the support as the latter is revolved by the driven clay-belt, substantially as described.

11. In a machine for cutting brick or other clay products, a cutting-wire, supporting-arms for said wire, rock-shaft 11, cam 23, and driving mechanism directly driven by the movement of a bar or stream of clay, in combination with a tilting table, and mechanism for tilting said table operated by the movement of the bar of clay, substantially as specified.

Cunningham's Brick Cutter is constructed so that it is driven by the bar of clay without the necessity of using a friction belt attachment, therefore, is an improvement over other End-cut Automatic Cutters offered to the trade.

Purchasers of Cunningham's Automatic Cutting Tables run no risk of patent suits or expensive litigation.

For further information address,

The Wallace Manufacturing Co.,

Or our CHICAGO AGENTS,
Chicago Brick Machinery Co.,
225 Dearborn Street, CHICAGO, ILL.

Frankfort,
Indiana.

SOUTHERN TRADE NOTES—Continued.

of making half a million building brick this summer and permanently maintaining the yards.

Pottery manufacturers of East Liverpool, O., have started a movement that promises to furnish a home at that point for the many girls working in the city's potteries. Many of these women are from adjoining towns, and it is the intention of the manufacturers to furnish them home-like and cheerful quarters at small cost. One hundred will be accommodated at first.

The Wheeling (W. Va.) Pottery Company have closed down their plant in part, and will end the season's work in the remaining departments this month. Extensive repairs and improvements are planned, and the plant will be in the best of shape for the resumption in the fall.

The recently enlarged and improved plant of the Burford Pottery Company, at East Liverpool, O., was almost totally destroyed by fire on the night of the 21st ult., with a loss of \$45,000; insurance, \$27,000. The plant was busy, rushed with orders, and will be rebuilt.

W. T. Harris & Co., of Richmond, Ky., have put their plant into operation for an extensive run, after an idleness of more than two years. They have made important improvements, and their output will be both larger and of better quality than heretofore.

Saulsberry Bros., of Aden, Ky., are preparing to open new and extensive fire clay mines near that point in the famous eastern Kentucky flint clay field. The operations will be on the line of the C. & O. Railroad.

The output of the East Liverpool (O.) potteries for 1896 reached 27,000 tons, against 25,000 tons in 1895, with a monetary value increase estimated at \$360,000, a showing of which the field is particularly proud, considering the price had decreased almost 10 per cent., while other sections were complaining of no demand.

The Ballentynes' clay grinding plant, of New Cumberland, W. Va., has commenced operations, with a capacity of one

hundred tons per day, and orders at hand sufficient to keep them busily engaged for some weeks. The outlook is encouraging.

An effort is being vigorously made to effect a consolidation of the three operative potters' organizations of the country—the Potters' National Union, embracing the general ware workmen of Trenton and the East; the Sanitary Potters' Union, also of Trenton, but including employees of the sanitary ware potteries of the entire country, and the National Brotherhood of Operative Potters, embracing the general ware operatives west of the Allegheny mountains. The indications are favorable to its consummation, and a demand for a restoration of the 12½ per cent. reduction of three years ago would probably follow.

Experiments the past few months among Ohio valley potters and Pittsburg glass manufacturers with an English system of decorative transfers have furnished astonishing results. From the work so far it would appear that former processes will be entirely abandoned, while the work of hand painters, designers, engravers and printers will be replaced to an extensive degree.

C. O. L.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

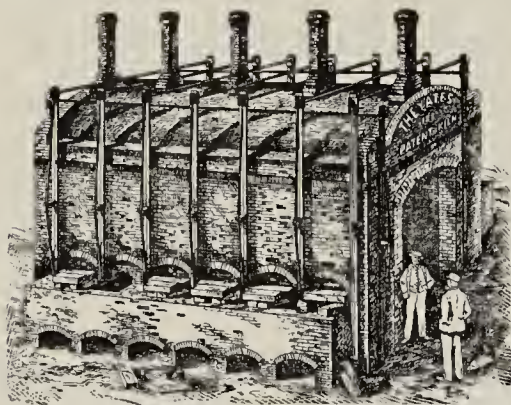
Mention the Clay-Worker

THIRTY-FIRST NATIONAL ENCAMPMENT G. A. R., BUFFALO, N. Y., AUGUST—BIG FOUR ROUTE.

The "Big Four Route" is well known to the "Boys in Blue," and is their favorite route to all National Encampments. The very low rate of one cent per mile each way will be in effect on all parts of its system, and the superior through train service to Buffalo from Peoria, St. Louis, Louisville, Indianapolis, Cincinnati, Dayton, Springfield, Columbus and intermediate points, via Cleveland or via Toledo and Detroit, has placed the "Big Four" in the lead. Full information will be cheerfully given by any agent upon application.

WANTED—Situation as superintendent of a paving or building brick plant. Know how to operate and manage both, and am familiar with all kinds of machinery, driers and kilns. Have had years of experience, and am thoroughly reliable. No bad habits. Address **BOX 88,** 6 tf d Care Clay-Worker.

WANTED—A situation as foreman or superintendent of either building brick, fire brick or sewer pipe manufactory. I have had 20 years' experience, am 33 years old, and can give the best of reference as to habits, sobriety, etc. Will accept moderate salary if situation is permanent. Address **BOX 6252,** 6 t t Care Clay-Worker.



**For Economy of Fuel
and Percentage of
Hard Burned
Brick**

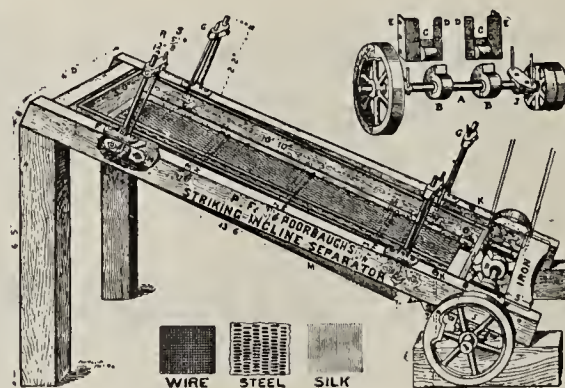
This kiln has no equal, I will be glad to tell you all about it.

ALFRED YATES,
Johnsonburg, Penn.

BRICK CARS
30 Different Styles,
Let us Save You Money.

Walworth Run Foundry Co.,
CLEVELAND, OHIO.

STRIKING INCLINE SCREEN



For Clay, Shale, Sand, Crushed
Stone, Cement, Fertilizer
and all Minerals.

These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the

THE PITTSBURG MINERAL SCREEN CO.

Write for Prices.

PITTSBURG, PA.



Read What

H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE, 60TH AND HAVERFORD STS.

TELEPHONE 147, W. P.

**H. C. CARROLL & SONS,
Brick Manufacturers,**

Residence, 3831 Lancaster Avenue.

3 YARDS: { 57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

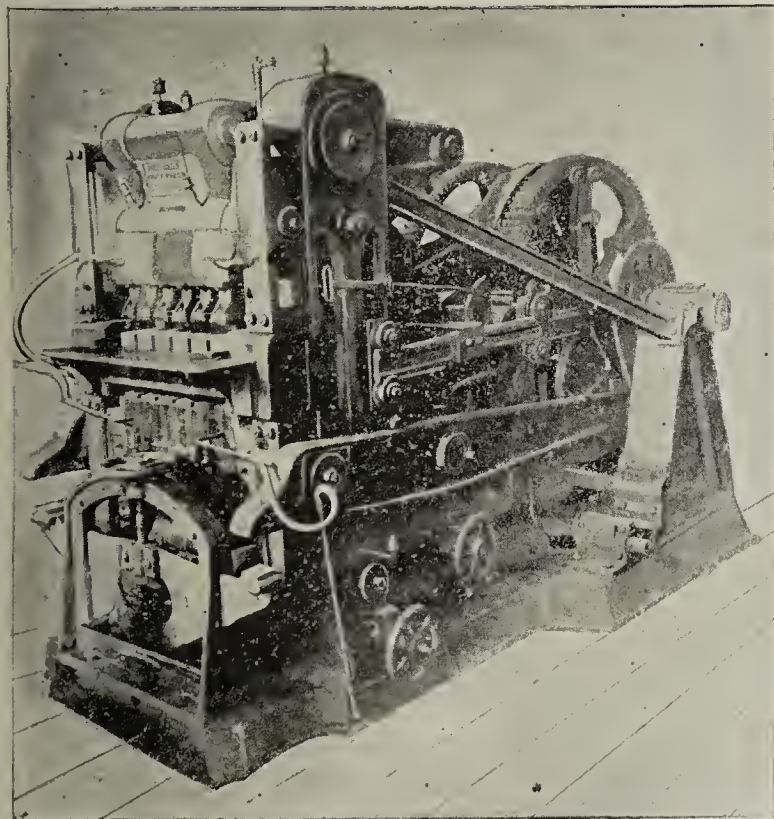
We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell your troubles to"

The F. D. CUMMER & SON CO., Cleveland, Ohio.

The PROGRESS BRICK PRESS.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE
ON APPLICATION.

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R.

ST. LOUIS, MO.

A SUGGESTION.

Some of our tilemakers complain about the scarcity of money. At the same time our banks have more money than they know what to do with, and good securities never sold so low. Very few banks pay anything on deposits, and where they do it is a mere pittance. Among the depositors are many farmers. They are not saying anything about it, but they have the certificates. There are more farmers than you think who have money loaned which they can get when they want it. We have known farmers to buy tile on twelve months' time when they had money loaned at 7 per cent. which they could get at the word, and after getting the tile at a cash price boast of their shrewdness in keeping their money at interest and buying tile on time without interest. We suggest that tilemakers make it a rule to require a note drawing interest for tile sold on three, six or twelve months' time. By doing so we think quite a good many will skirmish around and find the money to pay for the tile they buy rather than give their notes. The tile manufacturer has his pay roll and other expenses which have to be met, and he can always do better with the cash. When a settlement has been made by note the note may be discounted and a raise of needed cash made to carry on the business. In times like these, when competition is sharp and sales are made on small margins of profit, the manufacturer can usually do better in buying supplies if he has the cash to pay down. Every dollar saved in production increases the per cent. of profit. Besides, settlement by note will usually secure prompt payment, whereas, if sales are made on open account, the payment is often long drawn out. There is no class of goods which pays so large a per cent. of profit, year in and year out, as drain tile, and the purchaser can well afford to pay the cash or its equivalent for it. We advise, therefore, that, so far as possible, it is best to make and sell tile upon a cash basis.

HANDLING TILE.

In the manufacture of tile, as in many other things, their appearance and excellence depend much upon the handling. There is a marked difference in this respect seen in visiting different yards. The tile on some yards are smooth, straight and perfect in form. In other yards they are crooked, flattened, rough and uneven at the ends. If you are a wise purchaser you would prefer the straight, smooth tile at a dollar or two more on the thousand rather than the latter. The difference is the handling. On some yards the help is required to handle with care, and smooth off the rough ends. In other yards it is "hip, hurrah!" boys; the tiles are grabbed hastily and slapped together, or three

A SURPRISE

To the Brick Manufacturers.

.....

Address **The Horton Mfg. Co.,**
PAINESVILLE, OHIO.

THE
Best Up-to-Date Brick Dryer.

The PHILLIPS DRYER is THE BEST DRYER because it dries brick Quickly, Safely and Cheaply. By this system there is really no cost for fuel for it saves more fuel than it uses. This may sound queer but it's A PROVEN FACT.

SOMERSET, MASS., August 26, 1896.

S. G. Phillips, Esq., Rahway, N. J.

DEAR SIR—Replying to your inquiry regarding Dryer. We are pleased to say the dryer has now been running five weeks, and so far has given the best of satisfaction, drying our pressed brick for enameling in 10 hours, size of brick (9" x 4½" x 3") without warping or checking.

A vacuum gauge to the exhaust, that heats the dryer, shows our variable cut-off engine to be made condensing, and it is safe and not over-estimated in any point of view to say, the dryer is so far working all right, and costing us no extra power, or firing, as we also do our former work and yet are saving 20 per cent. in our fuel.

We consider the dryer to be doing all if not more than promised, and hope soon to add to our present capacity another two track section.

Yours truly,
SOMERSET & JOHNSONBURG MFG. CO.,
By Warren H. Sanford, Treas.

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

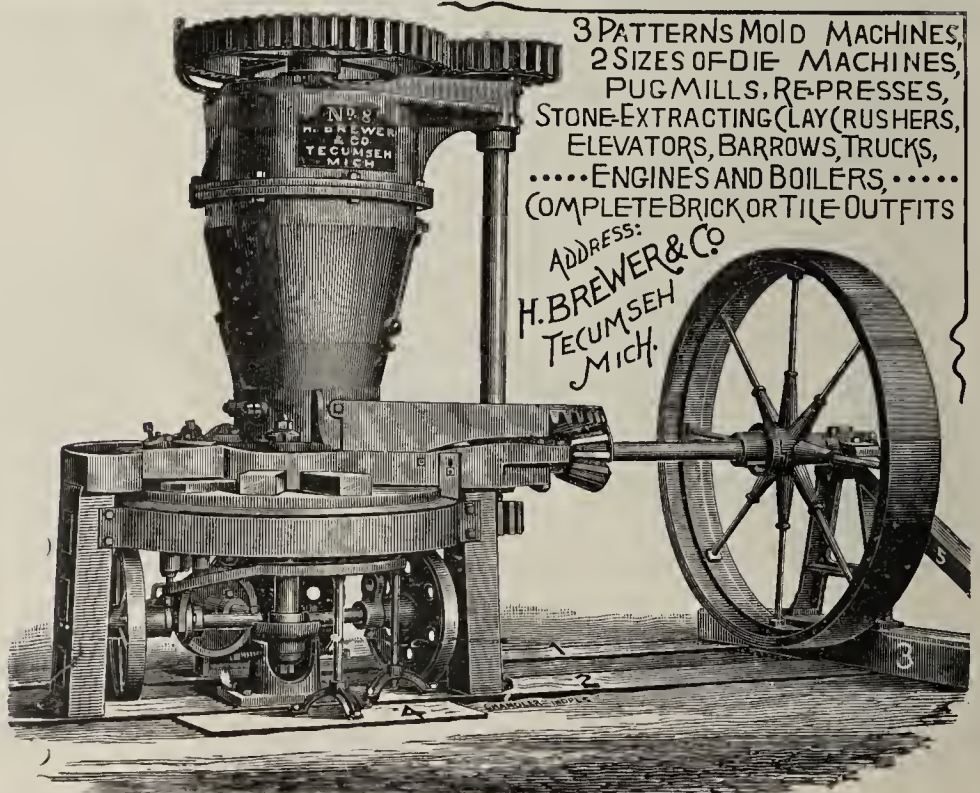
Yours respectfully,
CHAMBERS BROTHERS CO.,
J. H. Chambers, Gen'l Mgr.

S. G. PHILLIPS.

Agent and Patentee,

161 Grand Street.

Rahway, N. J.



3 PATTERNS MOLD MACHINES,
2 SIZES OF DIE MACHINES,
PUG MILLS, RE-PRESSES,
STONE-EXTRACTING (CLAY) RUSHERS,
ELEVATORS, BARROWS, TRUCKS,
..... ENGINES AND BOILERS,
COMPLETE BRICK OR TILE OUTFITS

ADDRESS:
H. BREWER & CO.
TECUMSEH
MICH.

G. COLDEWE & CO.,

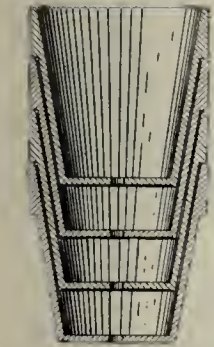
MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and... MACHINE MOULDS

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

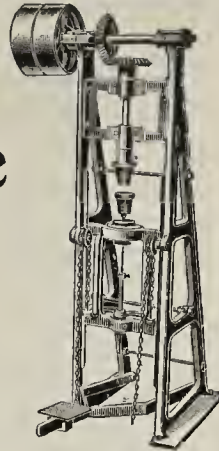
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

INDIANAPOLIS, IND.

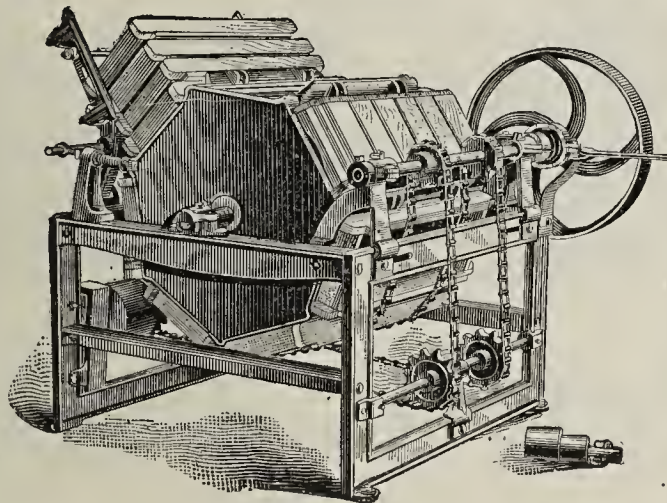


CHAMPION Brick Mould SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and serviceable.

A. H. NEWTON,

Manager and Sole Agent,
HAVERSTRAW, N. Y.



THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, and a suit for that purpose has been commenced against Buck and is now pending in the United States Circuit Court for the Northern District of New York.

Only one patent No. 301,087 was involved in that decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit has been commenced on these patents against Buck, and any persons purchasing from him or his agents will be prosecuted for infringement.

4000 TO 5500

(Gallons of Water per hour.)

BY HAND-POWER.

Pumps, Hand-power Pumps.

(LOUD'S PATENT.)

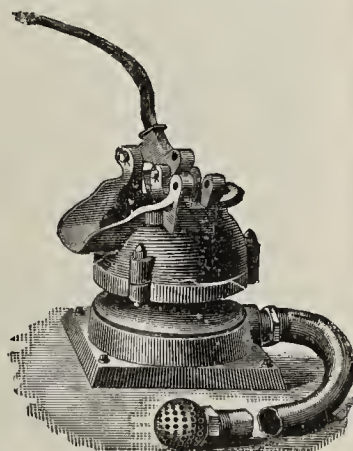
These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries or wherever it is desired to raise a large quantity of water by Hand-power. The pump has large valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



or four handled together and chucked down on to the drying slats when soft as roughly as if they were hardy brick.

Not long since we were visiting a tile-yard where the tile had been burned hard enough, but "rough" hardly expresses their condition. The proprietor said: "Purty good tile, ain't they?"

"They are burned hard enough, but they are so rough and out of shape," we replied.

"Oh, that don't make any difference."

"Yes, it does. You can't get as good joints in laying the tile, and then some of them have been knocked together and flattened, and they don't carry as much water, and you don't get a close joint, and the drain is only as good as the meanest tile put into it," we replied, with some spirit.

He grunted out in reply that "there was no use in being so particular."

"Yes, there is, my good fellow. It makes the difference, oftentimes, between success and failure. If I lived in this vicinity and wanted tile, I would go two or three miles further to get smooth, straight tile; I would do it every time. I dislike to have anything to do with rough, crooked, flattened tile. It is all the result of careless handling," we said.

"But the boys will handle them rough," he replied.

"They would not for me; they would walk up to the captain's office and get their pay or do better. I would not have it," we rejoined.

Some tile are not only poor on account of the careless handling, but, in addition, they are discreditable to those that make them.

Rough, misshapen tile will sell when the supply is short, but have to suffer a heavy discount if sold when the demand is not equal to the supply.

B. Y. P. U. CONVENTION, CHATTANOOGA, TENN., JULY 15-18-BIG FOUR ROUTE.

For the Baptist Young People's Union of America to its annual convention the Big Four Route will name rate of one fare for round trip from all points on its system. From the East through trains run to Cincinnati, making direct connection with the Q. & C. Route and the L. & N. Railway in Central Union Depot. From the north a choice of routes is offered via Cincinnati or Louisville. For rates, routes and full information call on any representative of the Big Four Route.

A BIG BARGAIN.

For sale cheap—a well-equipped brick plant in Northern Wisconsin; no other plant within 50 miles; clay burns red and there is an abundance of it; good railroad facilities, low freight rates and a growing market; forty acres of clay land and large amount of timber suitable for fuel. A fine opportunity for a young brickmaker to start for himself. For full particulars, address WALLACE, Care Clay-Worker.

**EPWORTH LEAGUE CONVENTION,
TORONTO, ONT., JULY 14-18—
BIG FOUR ROUTE.**

The Big Four Route will name special low rates for this convention, and calls attention to superiority of its line from St. Louis, Peoria, Indianapolis, Cincinnati, Dayton, Springfield, Columbus, via Cleveland, Buffalo and Niagara Falls, to Toronto, or via Toledo and Detroit. Apply for full particulars.

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cent a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE—One 40-inch second-hand Stedman Pulverizer, at your own price. 61 d Address W, Care Clay-Worker.

WANTED—A second-hand board delivery carriage, 2¾-inch cut; must be in good condition and cheap. Address H. E. STONE, Wickliffe, O. 61 c

WANTED—Small-size Little Wonder, or sword brick machine. Address, stating lowest price, D. J. KENNEDY, 61 cm 2730 Dickson Street, St. Louis, Mo.

FOR SALE OR RENT—A stoneware plant at Sioux City, Ia. Clay convenient and of excellent quality. Good prices. Market practically unlimited. Terms liberal. Address SIoux CITY BRICK AND TILE WORKS, 63 d Sioux City, Ia.

FOR SALE—One second-hand plain slide-valve Steam Engine, 12x24-inch cylinder, with pulley fly-wheel 8 feet in diameter by 17-inch face. Engine complete with governor and stop valve, and by maker of good reputation. We will put in order and place f. o. b. cars Philadelphia for \$300. Address CHAMBERS BROS.' CO., Philadelphia, Pa. 62 L

FOR SALE—One 4-mold Boyd brick press, one 4-mold Eureka dry press brick machine, both in first-rate order; one straight line engine, 14x14, in excellent condition; one 8-foot Sturtevant blower; eight 7-foot drying fans; five second-hand horizontal boilers, 50 to 60 H. P., 5 and 6-foot diameters; one Raymond repress, small size, for hand work; 100 iron bedsteads; one No. 2 Worrell drier; one disintegrator, suitable for clay or tile manufacturers; 3,000 seggars, suitable for china or tile work. The above are in good order (excepting the boilers), and will be sold at a bargain. Address C. SIEDLER, President, 6th Floor Presbyterian Bldg., 25 dm No. 156 Fifth Ave., New York.

FOR SALE CHEAP.

One Boyd 3-mold dry press; one Penfield plunger stiff mud machine, capacity 30,000 per day; one set smooth rolls, 3-inch die; one chain disintegrator. This machinery has been very little used. Inquire of 62 c G. H. DOWNING, Kearney, Neb.

TO LEASE OR FOR SALE.

A PROPERTY containing five or six veins of coal measure clays of various colors, suitable for the manufacture of a tough, hard, vitrified paver and yellow or yellow and black mottled building brick. Property is opened and operated for coal. Is located in Maryland, on B. & O. Railroad, 208 miles from Baltimore, 182 miles from Washington and 308 miles from Philadelphia. Can also be opened on Pennsylvania Railroad at small expense. Freight rates on brick to the above cities considerably lower than from Wheeling, W. Va. Best quality of semi-bituminous coal for down-draft or closed kiln can be purchased for 75 cents per gross ton, or mined on the property by parties leasing. Stream within 100 yards. Address PAVER, 61 d Care Clay-Worker.

HARDIN & CHURCH

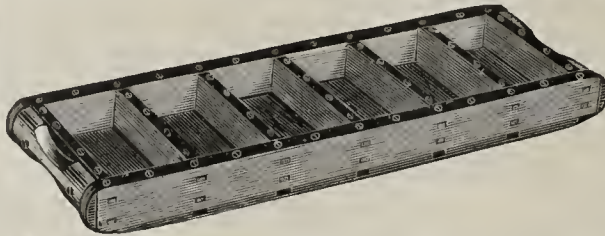
MANUFACTURERS OF

BRICK MOULDS

Of every kind and description. We make a specialty of Brick moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.

FREEPORT, IND.



Don't fail to get our prices.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

F. H. C. MEY, Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

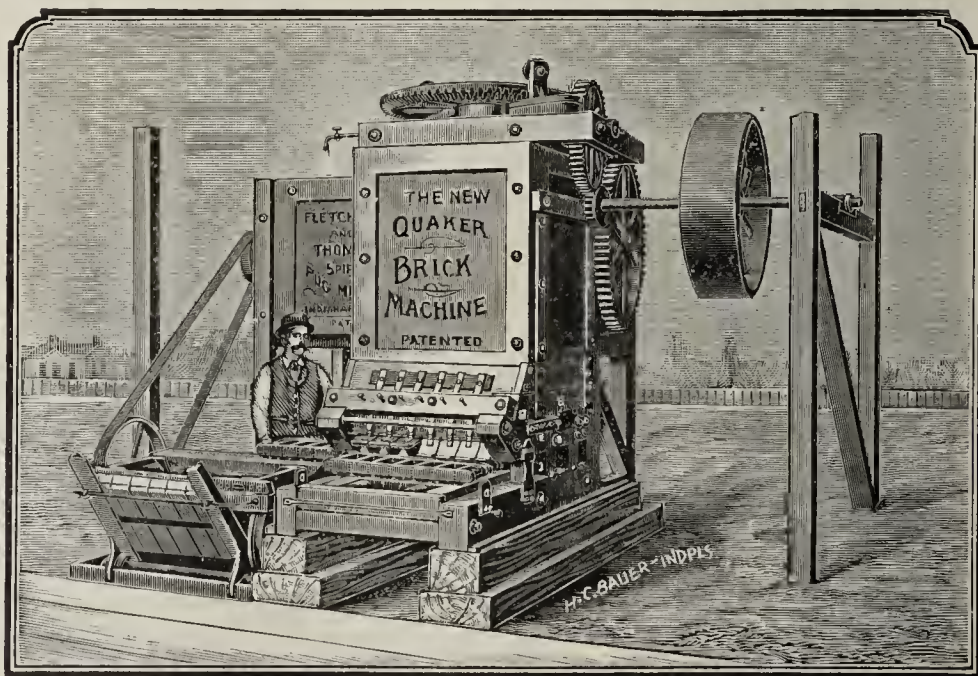
Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

Soft Mud Brick Machinery,

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sanding Machine, capacity 40,000 or more per day. We carry in stock a full line of first class brickyard supplies at a very reasonable price. Send for Catalogue.



JAMES W. HENSLEY,

General Agent,

Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

FIRE

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
 44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

GEORGE A. MOSHER,
President.

JAMES A. BUCK,
Vice-Prest. and Gen. Man.

LE ROY VERMILYEA,
Secretary and Treasurer.

The Buck Machine Company,

SOLE MANUFACTURERS OF

Champion Brick Mold Sanding Machines, COHOES, N. Y.

The above Company was duly incorporated on the 8th day of March, 1897, under the laws of the State of New York, with a capital of \$60,000, which has been fully paid in.

This company has acquired by purchase all the interests of J. A. Buck and others in the business of manufacturing Champion Brick Mold Sanding Machines heretofore conducted by him, together with all patents covering said machines.

Of these patents, No. 301,087 is the foundation patent on the feed-rack applied to a cylinder machine. Buck's title to this patent was fully sustained by the decision of the United States Circuit Court of Appeals filed December 8, 1896, which decision was affirmed January 25, 1897, and a motion for a rehearing of the case denied. From this decision there is no appeal, and the title to this patent cannot be disturbed.

Patent No. 499,206 was sustained by Judge Cox of the United States Circuit Court in a decision filed February 6, 1897, wherein he also sustained Buck's title to said patent. This patent covers the yielding form of feed rack as used in the later Champion Sanders. On February 15, 1897, a decree of the Court was entered granting and injunction against the use of infringing machines.

A copy of these decisions will be sent by mail upon request.

Claims against users of infringing machines will be actively prosecuted.

This Company is now prepared to promptly furnish the latest and most approved style of Champion brick mold sanding machines.

These machines are guaranteed in every respect, and purchasers will be fully protected in their use.

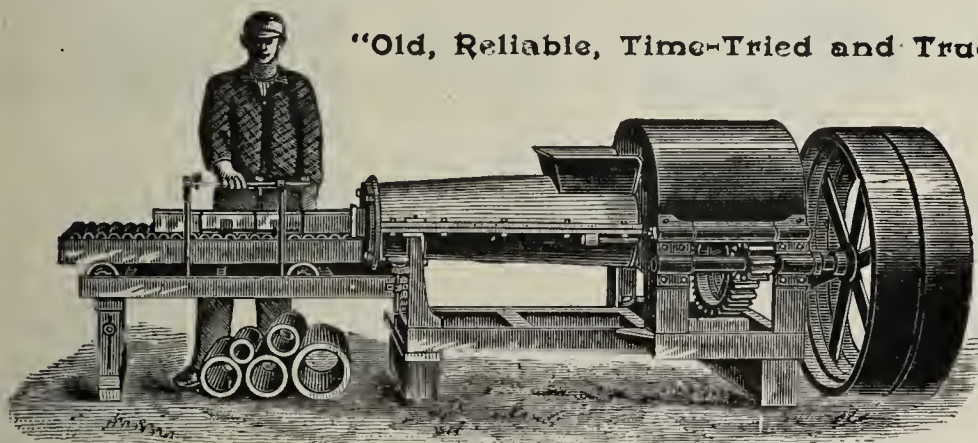
No agents should be recognized except those presenting credentials from this Company.

All communications, orders and payments should be made direct to

THE BUCK MACHINE COMPANY, Cohoes, N. Y.

KELLS & SON'S IMPROVED BRICK AND ... TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON, PARKHILL, ONTARIO,

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the NEW QUAKER BRICK MACHINE.

FOR SALE—Simpson Brick Press; good order. Address **H.**,
21 tf Care of Clay-Worker.

FOR SALE—Two complete overgeared 8-foot dry pans, with 48-inch pulley, entirely new. For particulars inquire of **SMITH & CAFFEY**,
34 cm Syracuse, N. Y.

NO DRY PRESS Brick Plant complete without the Carmichael Clay Steamer. **T. W. CARMICHAEL**,
6 t f d Inventor and Manufacturer,
Wellsburg, W. Va.

FOR SALE—At less than half price—One Penfield stock brick machine and pug mill for sand molded brick, with all pulleys, in good order and ready for making brick. Reason for selling: changed to stiff mud. Address **FACE**,
5 t f d Care Clay-Worker.

WANTED—Wish one or two men with \$20,000 to join me in buying a \$100,000 clay plant for \$30,000, near Chicago. Am a thorough clay man and wish to associate with practical clay men in this deal. Plant is running and making money. Owner has gone to China to build railroad. Address **61 d**
Box 100, Care Clay-Worker.

FOR SALE—Plain slide valve horizontal engine, 40-horse-power, 9-foot fly wheel; 1 Crabtree hand repress; 9,000 soft mud foot pallets, 36 inches long; 1 Potts horizontal brick machine; 1 Potts No. 3 disintegrator; 1 Potts sander, and 1 Newall crusher, 26-inch. All in perfect condition.
HAMBURG VITRIFIED BRICK CO.,
53 c Hamburg, Pa.

FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, ¼ screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
All new or little used, and in excellent condition. **WALNUT**,
5 t f d Care Clay-Worker.

FOR SALE.

SIMPSON DRY PRESSES.

We have two Simpson presses that we will sell for \$1,800 each, f. o. b. cars Cleveland, O. These presses cost our company \$3,500 each, and not over 500,000 brick were made on them, as we changed our plant from a front pressed brick works to a paving brick works. We guarantee these presses to be in perfect working order, and almost as good as new. Address **FRANK B. MANY**, 809 Cuyahoga Bldg.,
52 d Cleveland, O.

REAL BARGAINS IN NEW AND SECOND-HAND MACHINERY.

FOR SALE—A good soft mud brick machine, just as good as new, at the price of an old one; capacity 30,000 to 40,000 a day. Has worked successfully where others failed.

FOR SALE—A second-hand 60-horse-power slide valve engine, rebuilt, and a much better engine than many of the light ones now on the market; good for years of heavy work.

FOR SALE—A small but good tile machine, will make 3 to 8-inch tile or common brick, with 10-horse-power; just the thing for a small factory, and cheap.

FOR SALE—A good, though cheap, second-hand 40-horse-power piston valve engine, in excellent condition; suitable for small tile or brick plant.

MADDEN & CO.,
4 T 3t Rushville, Ind.

FAST TIME AND THROUGH SERVICE TO SOUTH BEND.

Commencing June 22, through parlor cars will be operated between Indianapolis and South Bend daily, except Sunday, on Big Four train No. 3, leaving Indianapolis at 5 p. m., making immediate connection with Vandalla line fast train at Colfax, which passes through Frankfort, Logansport, Lake Maxinkuckee and Plymouth, arriving at South Bend at 10:45 p. m. **G. E. ROCKWELL**, D. P. A., for details.

BRICK CARS and TRUCKS

Of Any and All Kinds.
Easy Running. Light yet Strong.

Don't fail to get our prices. Catalogue free.

THE ATLAS BOLT & SCREW CO.,
Cleveland, Ohio.

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,
—Wellsburg, W. Va.

Nine (9) sold already this Season.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers
... of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequalled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

THE IMPROVED
Interlocking Brick,
For Hollow Walls and Ventilating.

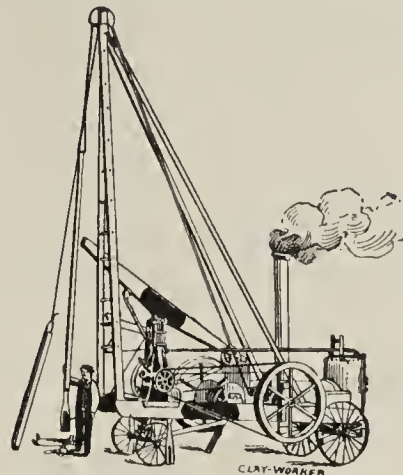
Send for pamphlet.

G. S. BALSLEY, 490 Howard Street, Detroit, Mich.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,
PERTH AMBOY, N. J.

Steubenville Foundry & Machine Works,

Established in 1820.

—Manufacturers of—

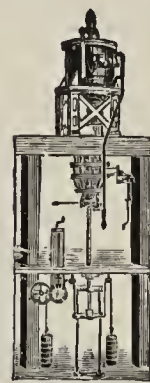
STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,

Making From 2 to 30-Inch
Pipe Inclusive.

Pipe, Brick, Tile, Coping,
Fire Proofing, and
Building Block Dies.

Clay Grinding and Tempering
Pans and Pug Mills.



**FEED
SCREWS
FOR
MINING
CLAY.**



**STEAM
— ENGINES**

—AND—

Every Variety of Iron and Brass Castings
Shafting and Pulleys.

Send for Circulars and Estimates.

JAS. MEANS & CO.,

Steubenville, Ohio.

COLORIFIC.

For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of

WESTBROOK & WELLS,
Ogdensburg, N. Y.

ALBANY SLIP CLAY.

We have a large bank of a superior quality of SLIP CLAY. Price very low by barrel or carload. Best of reference as to quality. Address

JOHN H. JACKSON,
Successor to JACKSON BROS.,
ALBANY, N. Y.

N Y State Drain Tile and Pipe Works.
Established 1852.

A. F. TENNILLE'S

Bureau of

News and Legislative Information,

Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.

Lake Erie & Western R. R.

...ALL RAIL...

Niagara Falls EXCURSION.

Wait for the Old Reliable Lake Erie & Western

PERSONALLY CONDUCTED

NIAGARA FALLS EXCURSION
Thursday, August 5, 1897,

...ALSO...

Sandusky, Put-In-Bay, Cleveland
and Buffalo, with side trips to

LEWISTON, TORONTO, THOUSAND IS-
LANDS, Etc.

For tickets, rate, time and pamphlet con-
taining general information, call on any
ticket agent of the above route, or address

C. F. DALY, Gen. Pass. Agt.,
Indianapolis, Ind.

LUMBER AND BRICK DRYERS, MOST EXTENSIVE IN USE. W. A. LEARY,

1103 H Street, N. W.

WASHINGTON, D. C.

Do You Want

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKMAN ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS,
ESTABLISHED NINE YEARS. Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.



"LEVIATHAN."

"Upon Earth There is not His Like."

.....Sept..... 1896.
MAIN BELTING CO., 55 and 57 Market St., Chicago, Ill.

Gentlemen:—Please ship us via freight, 146' x 18' 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige. Yours very truly,

Manufactured under Special Process.
A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

Main Belting Company,

Sole Manufacturers LEVIATHAN BELTING,
55 and 57 Market St., CHICAGO, ILL.

PHILADELPHIA:
1219 Carpenter Street.

BOSTON:
120 Pearl Street.

Elevators

For handling
CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.

Also Furnish
RUBBER,
LEATHER,
COTTON
BELTING.



Conveyors.

Manufacture
SHAFTING,
PULLEYS,
HANGERS,
GEARS,
CLUTCHES,
BUCKETS,
BOOTS,
BOLTS,
Etc. . . .

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in United States, Canada and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

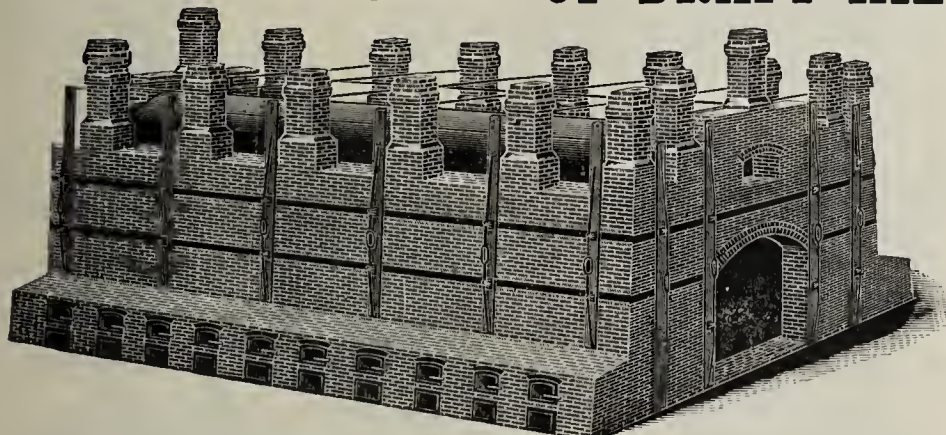
E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt.
Marletta, Pa.

Chenoa, Ill.



THE THAI SON LATEST IMPROVED COMMON SENSE UP-DRAFT KILN.



Do you make brick? And have you any trouble in burning them? If so, do you want a cheap constructed, simple and durable Kiln? One that will dry any brick without the assistance of Dryer or Fans, and in one-half the time. A Kiln where heat and draft can be changed to any part at will, and burn all hard brick, even and alike throughout, in less time, and with less fuel than any other, no up or down draft Kiln of any kind excepted. This is the Ideal Kiln for Dry Pressed Brick and the best on earth. Sure success with this Kiln. Call and see it at my works or for further information address,

Brick Manufacturer.

A. THAI SON, Laredo, Texas.



VANDUZEN STEAM JET PUMP
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
Always in Order, never Clogs nor freezes. Every Pump Guaranteed.
10 SIZES.
200 to 12000 Gallons per Hour.
Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, O.

GEO. S. COX'S
Ready Made
Cutting Wires,
Always give Satisfaction.

EAST LIVERPOOL, OHIO.

Send for Samples and Prices.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN,
H. W. FULLER, Ass't Gen'l Pass. Agent.
Gen'l Pass. Agent, CINCINNATI, OHIO
WASHINGTON, D. C.

M. V. B. WAGONER'S

SLIP CLAY { For Glazing of Pottery } WORKS

ESTABLISHED 1845.

Clay in stock in any quantity, in barrels and bulk by the carload.

Office, 20 Ten Broeck St., ALBANY, N. Y.

STOP-LOOK LISTEN

THE
POPULAR



IS THE BEST LINE TO

CHICAGO

TIME REDUCED TO 4 3/4 HOURS.
FOUR DAILY TRAINS

Leave Indianapolis	{ 7:00 a. m., 11:50 a. m. 3:35 p. m., 12:55 night
Arrive Chicago	{ 12:00 noon, 6:00 p. m. 8:20 p. m., 7:20 a. m.
Trains	{ 3:30 a. m., 7:45 a. m.
Arrive Indianapolis	{ 2:35 p. m., 4:37 p. m.

LATEST IMPROVED

VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant

PARLOR CARS AND DINERS

Local Sleeper in Indianapolis Ready at 8:30 p. m.
Leave Chicago, Returning, at 2:45 a. m.
Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: 2 West Washington St., Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.

THE

HOT BLAST APPARATUS

FOR DRYING
BRICK
TILE AND
TERRA COTTA

American Blower Co
SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

SEND FOR CATALOGUE

VANDALIA LINE

The Short Line for

ST. LOUIS AND THE WEST.

LEAVE INDIANAPOLIS,	AR. TERRE HAUTE	AR. ST. LOUIS.
* 7:20 am	10:05 am	3:15 pm
* 8:15 am	10:15 am	3:15 pm
* 12:40 noon	2:35 pm	7:12 pm
* 7:00 pm	9:04 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am
*Daily.		

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46 Jackson Place and Union Station.

W. W. RICHARDSON, Dis. Pass. Agt.

ARE YOU LOOKING**FOR A CHANGE IN LOCATION?**

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS**BEST OF FREIGHT FACILITIES**

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS**MANY KINDS OF RAW MATERIAL**

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns WANTING INDUSTRIES

This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

**TAKE THE
BIG 4
TO
ST. LOUIS**

Mention the CLAY-WORKER,

When writing to Advertisers

Mention the CLAY-WORKER.

Conveying, Elevating and... Power-Transmitting Machinery.

H. W. CALDWELL & SON CO.

Specialties for Handling
Material of
all Kinds.

GENERAL MACHINISTS,
127, 129, 131, 133 West Washington St.,
CHICAGO.

CALDWELL
Steel Conveyor.

Manufactured exclusively by us at Chicago with latest
improvements

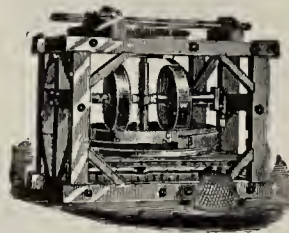
Send for Catalogue.



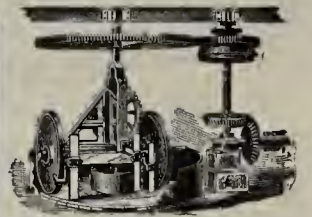
CALDWELL-AVERY SEAM-
LESS STEEL ELEVATOR
BUCKETS.

LINK BELTING.
SPROCKET WHBELS
COTTON BELTING.
RUBBER BELTING.
LEATHER BELTING.
BELT CLAMPS.
ELEVATOR BOLTS.
ELEVATOR BUCKETS.
CONCRETE MIXERS.
FRICTION CLUTCHES.
JAW CLUTCHES.
COUPLINGS.
FLEXIBLE SPOUTS.

GEARING (all kinds.)
ELEVATOR BOOTS.
HANGERS.
PERFORATED METALS.
PILLOW BLOCKS.
IRON PULLEYS.
WOOD PULLEYS.
SHAFTING.
SET COLLARS.
SWIVEL SPOUTS.
TAKE-UP BOXES.
TURN HEAD SPOUTS.
WIRE CLOTH.



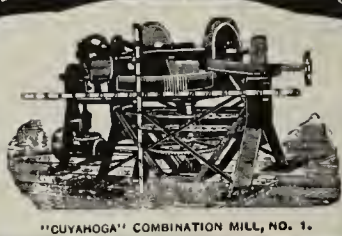
Dry Pan.



Clay Mill—Harp Pattern.

**THE
TURNER,**

VAUGHN & TAYLOR Co
MANUFACTURES & EXPORTERS OF
CLAY WORKING MACHINERY.
OHIO, U.S.A.
WIRE DRAWING MACHINERY.
CHAIN MAKING MACHINERY.
SHODDY AND RUBBER WASHING MACHINERY.



"CUYAHOGA" COMBINATION MILL, NO. 1.

POWER TRANSMITTING MACHINERY.**PULLEYS & GEARING.****CRANES**

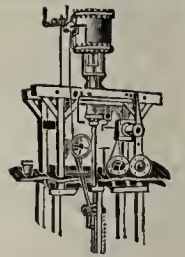
HEAVY CASTINGS
GRAIN CLEANING MACHINERY.
ROPE TRANSMISSION
HOLLOW TUBING MACHINERY.

AND

CONTRACTORS FOR
COMPLETE PLANTS.



Flower Pot Machine.



Vaughn Press—Sewer Pipe.

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

••••

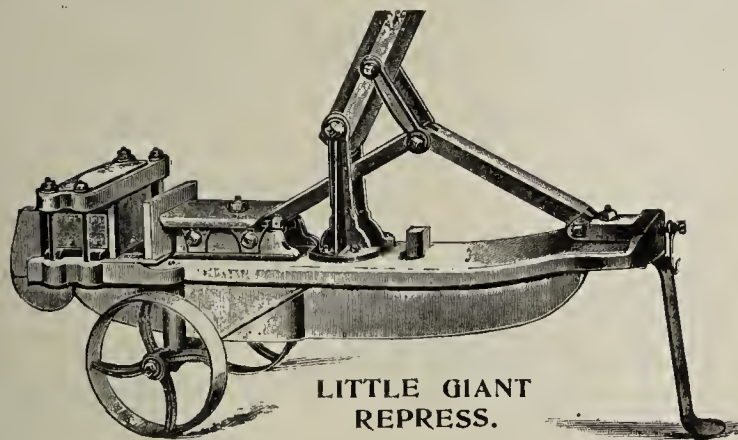
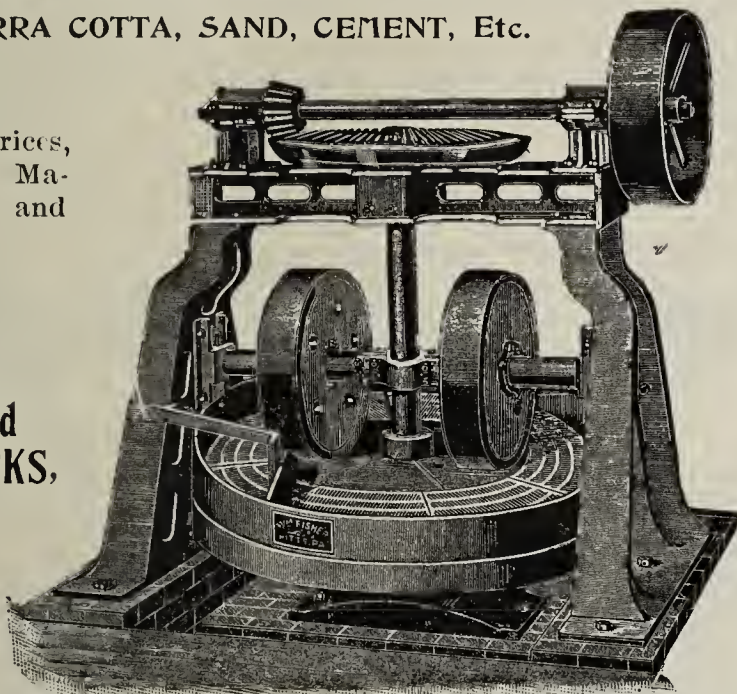
When writing for Prices, state kind of Clay or Material to be ground and capacity required.

••••

**FISHER ENGINE
FOUNDRY and
MACHINE WORKS,**

Phillips & McLaren,
Proprietors,

24th and Smallman Sts.,
PITTSBURG, PA.



**LITTLE GIANT
REPRESS.**

ELI Auger Machine,
Capacity 45,000 to
70,000.

ELI Jr. Auger Machine,
Capacity 30,000 to 40,000.

LITTLE ELI Auger
Machine, Capacity
15,000 to 20,000.

No. 1 A, Auger Machine,
Capacity 25,000 to 35,000.

No. 2 B, Auger Machine,
Capacity 12,000 to 20,000.

THE No. 1 A and No. 2 B Machines furnished with Square Hopper in place of Upright Pug Mill if desired.

DISINTEGRATORS, HORIZONTAL CONVEYORS,

GRANULATORS—SINGLE AND DOUBLE SHAFT,

UP-RIGHT PUG-MILLS, WINDING DRUMS,

BRICK TILE AND HOLLOW BLOCK TABLES.

TRUCKS, WHEELBARROWS, ETC.

Manufactured and fully warranted by

**Michigan Brick and Tile Machine Co.,
MORENCI, MICH.**

ARCHITECTURAL DRAWING

Designing; Architecture; Mechanical Drawing; Machine Design; Stationary, Locomotive and Marine Engineering; Electricity; Plumbing; Railroad, Hydraulic & Bridge Engineering; Surveying and Mapping; Sheet Metal Pattern Cutting; Bookkeeping; Shorthand; English Branches; Mining; Metal Prospecting. All who study **GUARANTEED SUCCESS.** Fees Moderate, Advance or Installments. Circular Free; State subject you wish to study. International Correspondence Schools, Box 958, Scranton, Pa.



Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD and JACKSONVILLE, ILLINOIS.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.	
Mail and Express.....	8.30 a m
Accommodation.....	3.25 p m
Fast Express.....	11.20 p m

ARRIVE.	
Fast Express.....	3.30 a m
Accommodation.....	10.40 a m
Mail and Express.....	4.50 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



INDIANAPOLIS AND CINCINNATI LINE

6 Trains Daily. Parlor Cars and Cafe Dining Cars on day trains; Pullman, Compartment and Standard Sleeping Cars, and Chair Cars, also Wagner Sleeping and Chair Cars on night trains. Direct Connection made at Cincinnati without Omnibus and Transfer, for all points **SOUTH and EAST**

INDIANAPOLIS, TOLEDO AND DETROIT

The Michigan Line (via Hamilton.)

5 Trains daily to Dayton.

2 Trains daily to Toledo.

2 Trains daily to Detroit.

Observation, Vestibuled Coaches and Parlor Cars on Through Express Trains. Pullman and Wagner Sleeping Cars on night trains.
G. W. Hayler, D. P. A. } Indianapolis,
W. J. Nichols, T. P. A. } Ind.
D. G. EDWARDS,
Passenger Traffic Manager.



The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,
Grassy Point, Rockland Co., N. Y.

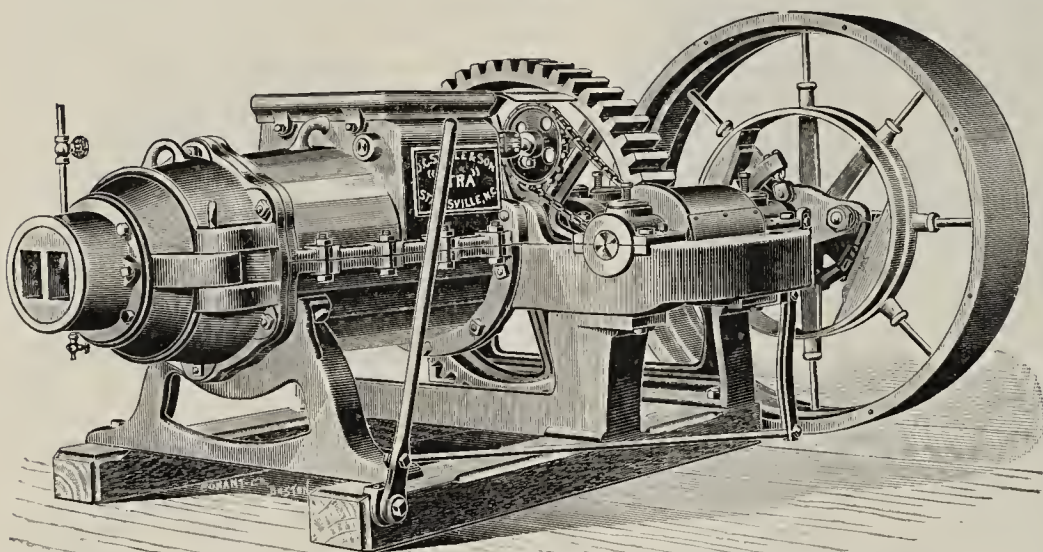
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.
[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

The New South Brick Machinery



X-tra Machine. Capacity 25,000.

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.

TACCIA, VA., June 30, 1896.

J. C. STEELE & SON, Statesville, N. C.

In answer to your enquiry will say we are using one of your latest Brick Machines shipped us about two months ago, and that it gives us pleasure to recommend it to any one wishing a good Brick Machine and one that will do all that is claimed for it.

We have had it thorough tested and it turns out work perfectly satisfactory. The contractor who is building the cotton factory here says its work is of an unusually high order.

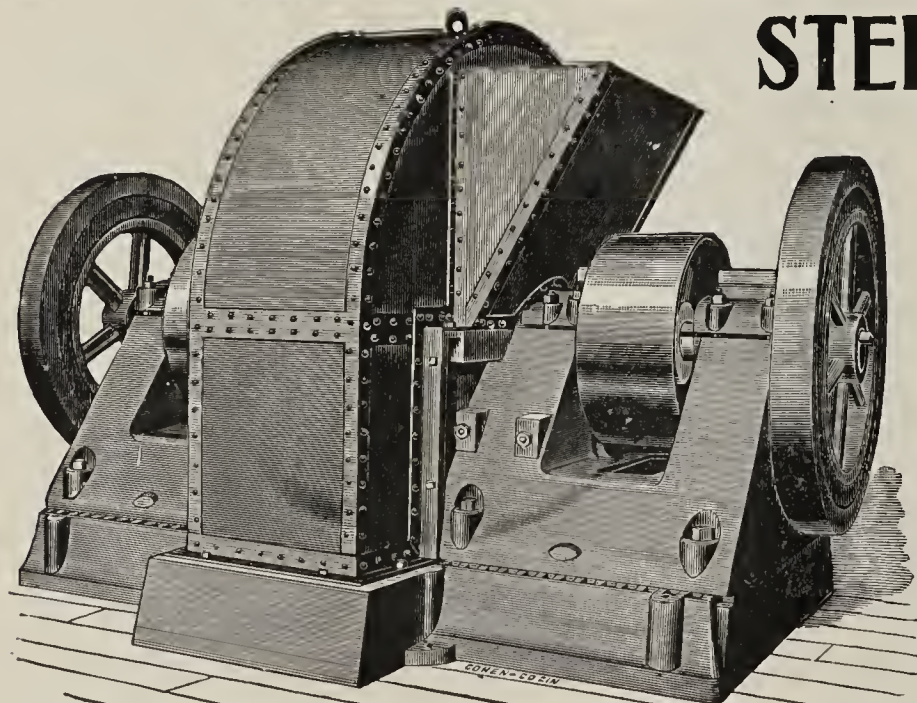
Yours respectfully,

T. A. CAPPS & CO.

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

STEDMAN'S IMPROVED CLAY DISINTEGRATOR



For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

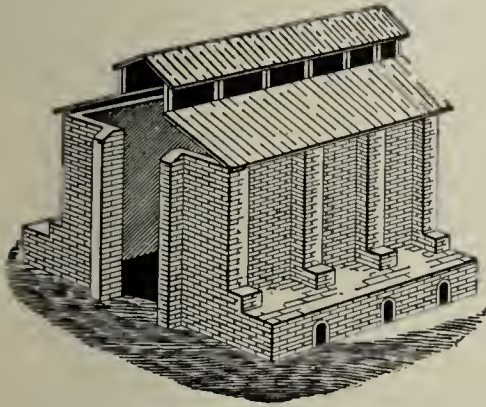
Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,
Aurora, Ind.

ROPKEY-MASON ENGRAVING CO.,

INDIANAPOLIS, IND.

Make the finest engravings of any and every kind—Wood Cuts, Photo-Engravings and Etchings. We made a specialty of Clayworking Machinery, and will be glad to quote you prices. Send for Samples.



Up-Draft Kiln.

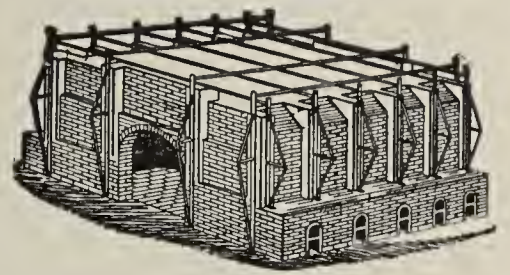
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be **THE BEST Up-Draft KILN IN THE MARKET.** The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiln.

ALSIP'S LATEST IMPROVED DOWN and UP-DRAFT KILN.

I S SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

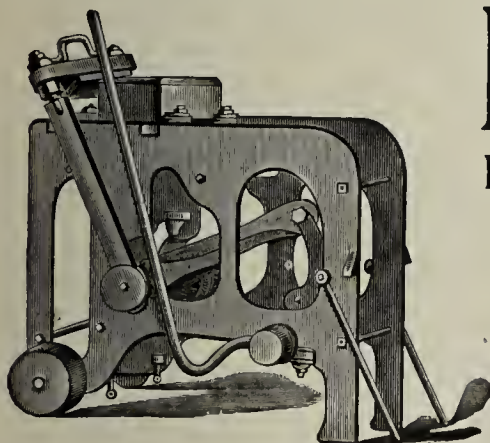
If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

Address. **S. H. ALSIP,**

Days Brick Yard.

BELLEVILLE, ILL.



RED BRICK PRESS.

GEORGE CARNELL,

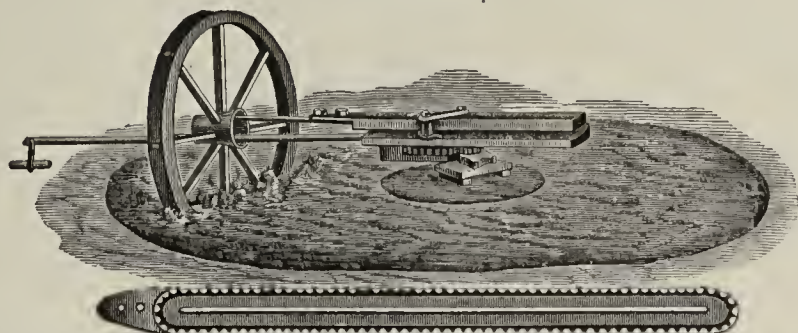
Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

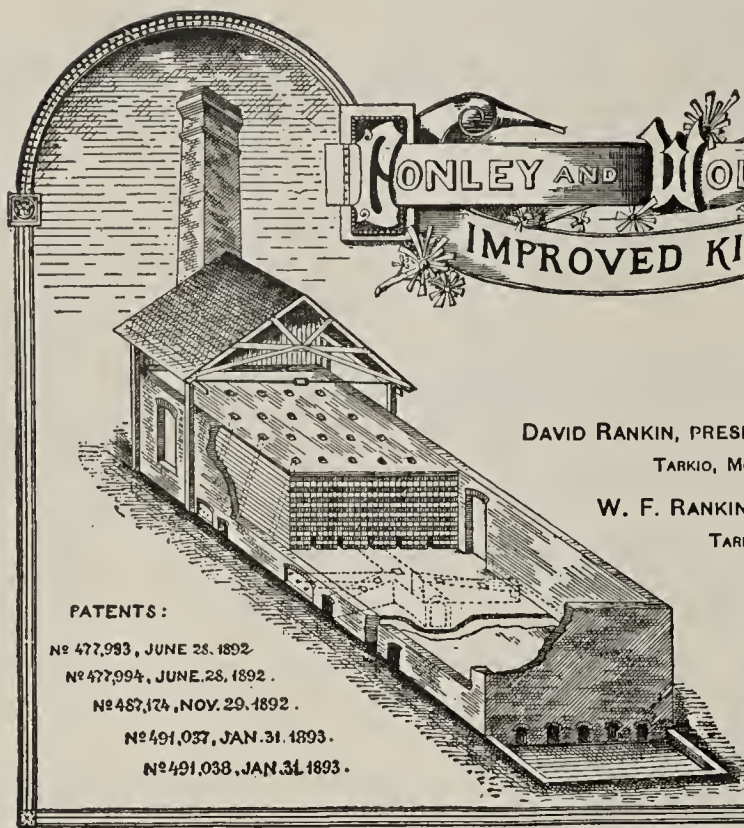
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Send for Circular and Price-List.



CONLEY AND WOLFE
IMPROVED KILN COMPANY.

TARKIO, Mo.

OFFICERS:
 DAVID RANKIN, PRESIDENT, TARKIO, Mo.
 JOSEPH CONLEY, VICE-PRESIDENT, MOUND CITY, Mo.
 W. F. RANKIN, SEC'Y AND TREAS, TARKIO, Mo.
 J. M. WOLFE, GEN'L M'GR, TARKIO, Mo.

PATENTS:
 No 477,993, JUNE 28, 1892.
 No 477,994, JUNE 28, 1892.
 No 487,174, NOV. 29, 1892.
 No 491,037, JAN. 31, 1893.
 No 491,038, JAN. 31, 1893.

THIS KILN is cheap to construct, simple in operation and permanent in character. It has no crown to fall in and costs nothing for repairs. The dampers in the bottom give complete control of the heat and draft. It burns all brick evenly and thoroughly. It heats the brick gradually and cools the same, producing a tough and thoroughly annealed brick. It requires less than 200 lbs. slack coal per thousand to burn the very best annealed vitrified shale paving brick. It saves labor—one man can fire the largest kiln.

The Slack is converted into Gas and all the Heat Energy in the Coal is Utilized.

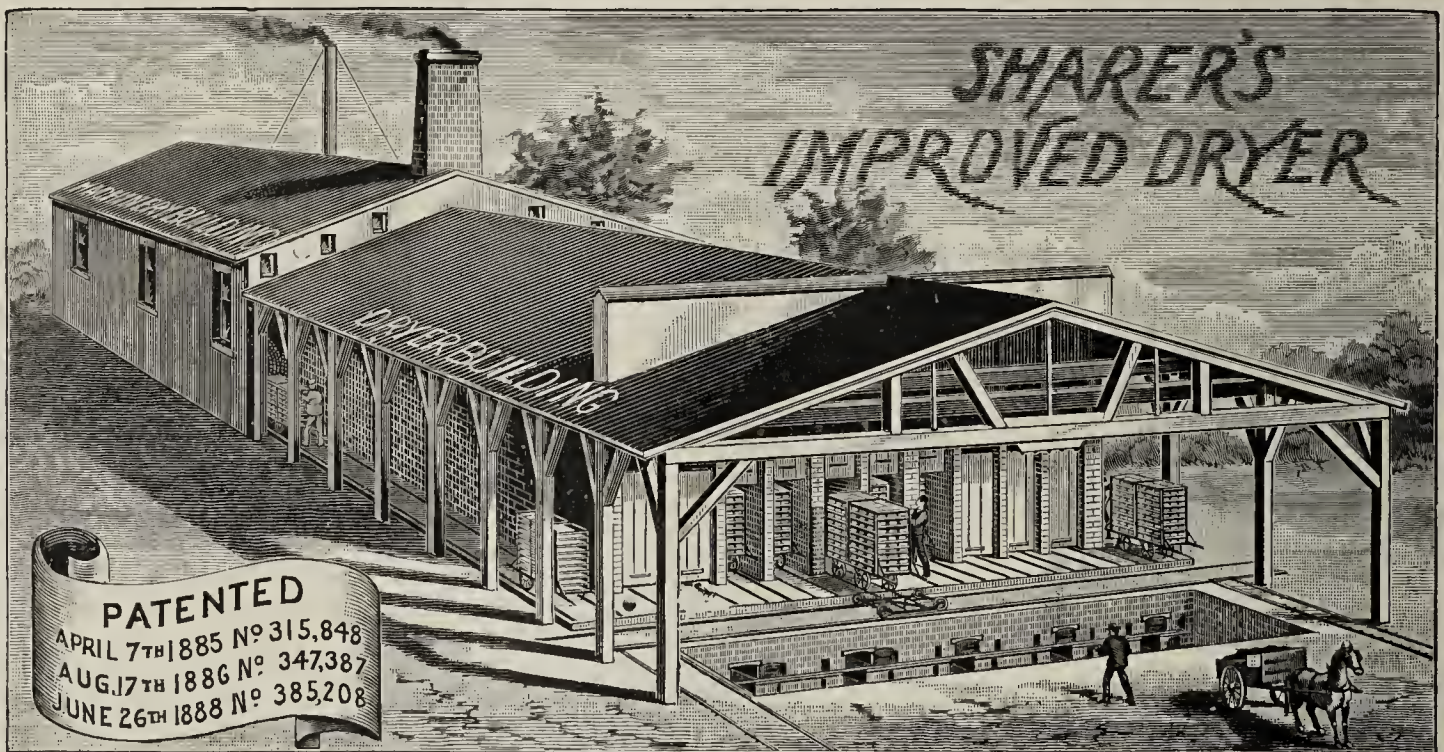
IT IS A SMOKE CONSUMER
AND A PROFIT PRODUCER.

✦ **YOU NEED THIS KILN.** ✦

WRITE OUR GENERAL MANAGER
FOR FULL INFORMATION.

Geo. W. Sharer,

Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.



COMplete Dryer and Kiln outfits, and Complete
Plants a specialty. Address

GEO. W. SHARER, 2224 Tioga, St. Philadelphia, Pa.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

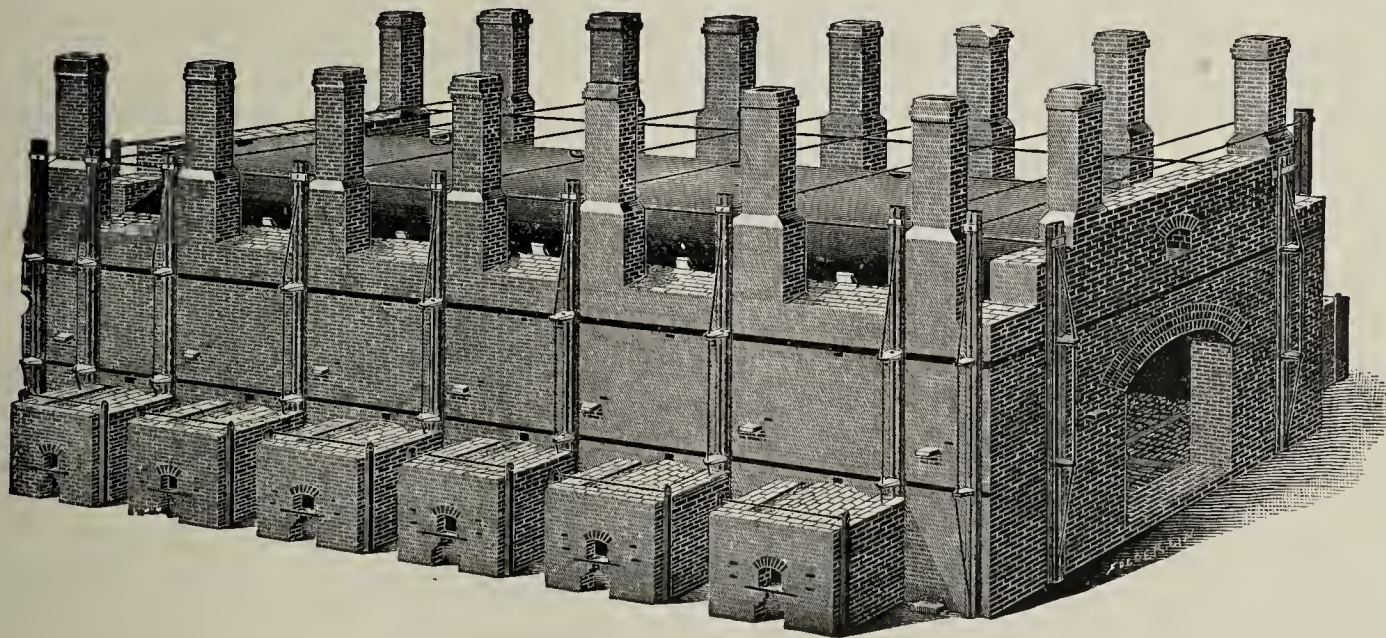
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

We Can't Compel You to



Purchase our machinery and we don't want to. We go in on our merits or not at all. All we want is a chance to explain to you the especial points of our machinery which fit it for your work, and the low prices at which we can furnish it. Then we leave the rest to your good judgment. If we cannot convince you that we have the best machinery, which will do your particular work better than anything else for the same money, we do not expect your orders nor want them. We don't carry a gun; reason is our only weapon.

Write us what your special needs are, and what you want to accomplish; then we will talk the matter over together. We don't charge for consultations either, like the lawyers.

CHICAGO BRICK MACHINERY CO., 225 Dearborn Street.

The Man Who Wants the Earth Generally Gets It==

When he dies, and frequently he gets it sooner than he wants it. Worry and aggravation often hastens the event.

'97 *Outing*
BICYCLES.

\$100
\$75
\$50

Do not create fretfulness by the many little inconveniences found in other wheels. Nothing ever comes loose; the balls remain in place and the adjustment is always secure.

Outings are built to be "temper proof." And they are.

You don't have to "go around the other way" just because the road is bad, if you're on an Outing. They plow through mud as readily as they sail over asphalt. They are mud proof as well as dust proof. Positively so. That's one of the reasons why experienced cyclists speak so well of them.

Send for '97 Art Catalogue, telling how they are made.

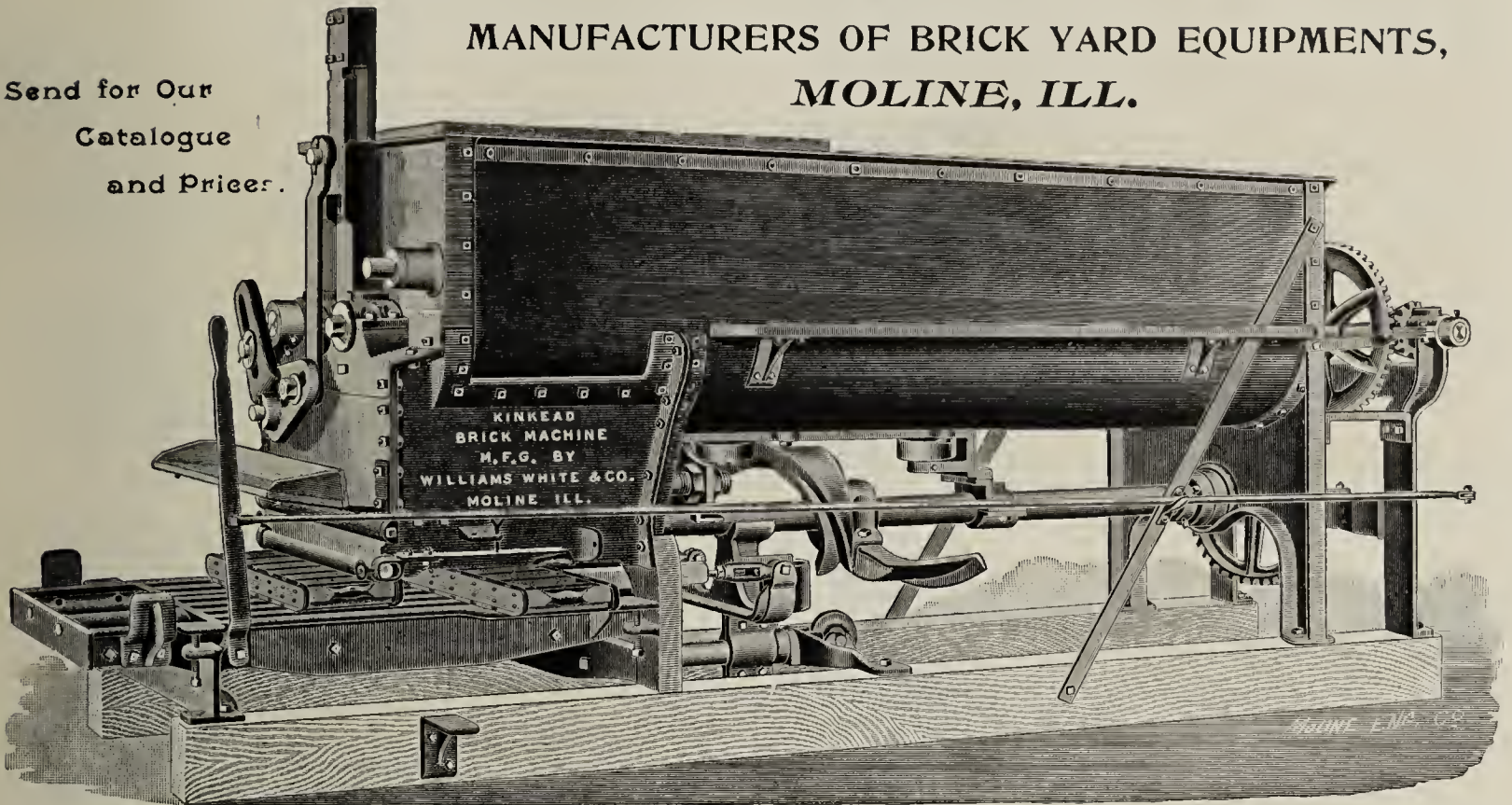
HAY & WILLITS MFG. CO.

76 N. Penn. St.,
INDIANAPOLIS.

WILLIAMS, WHITE & CO.

MANUFACTURERS OF BRICK YARD EQUIPMENTS,
MOLINE, ILL.

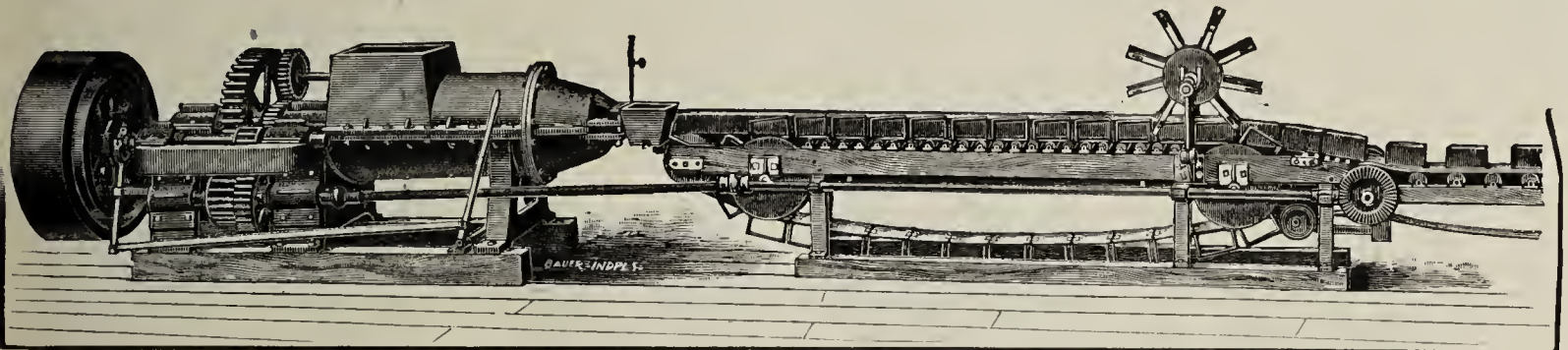
Send for Our
Catalogue
and Prices.



The **KINKEAD MACHINE** takes the clay direct from the bank, preparing it more thoroughly than any pug mill or machine on the market. It fills the mold full and sharp every time. It is simple in construction, easy to take care of, and durable.

We solicit correspondence also on complete outfits for brickyards—molds, trucks, barrows, cars of all kinds, elevators, sanders, disintegrators, etc., etc. Get our Mold circular and prices.

(Mention the CLAY-WORKER.)



* **LEADER** *

MANUFACTURING CO.

DECATUR ILL.

MANUFACTURERS OF

BRICK MACHINES, BRICK PRESSES,

PUG-MILLS, CRUSHERS

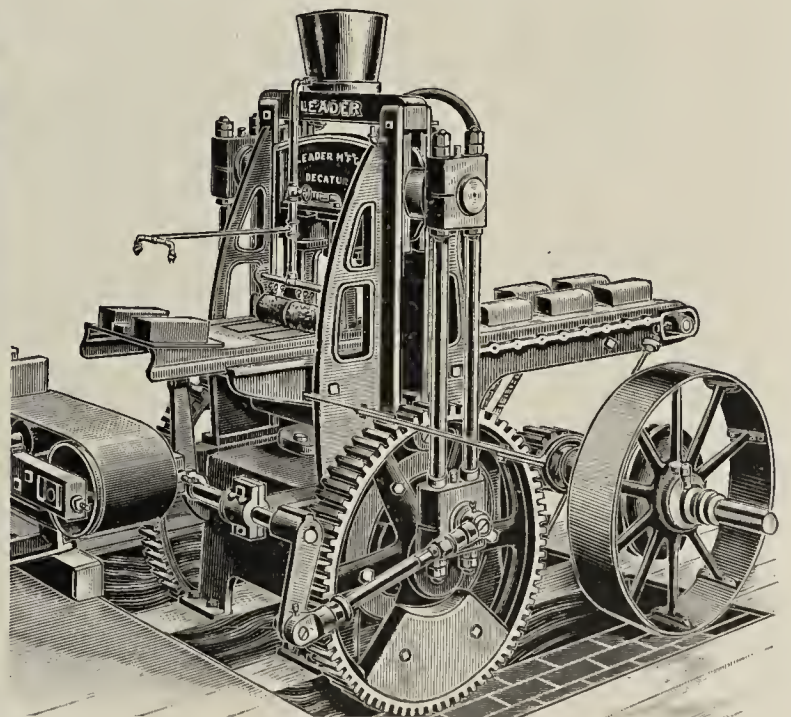
DISINTEGRATORS, AUTOMATIC CUTTERS,

+ **ELEVATORS** +

AND

COMPLETE OUTFITS.

SEND FOR PRINTED MATTER.



Do You Want A BRICK MACHINE A DRY PAN A PUG MILL?

IF SO DON'T FAIL TO

Get
Our
Prices,



They
Can't
... be
Beat.

.....

WOOLLEY'S MACHINERY is built on mechanical lines and of the best material. Our "**Iron King**" is a non-breakable brick machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ability of every part.

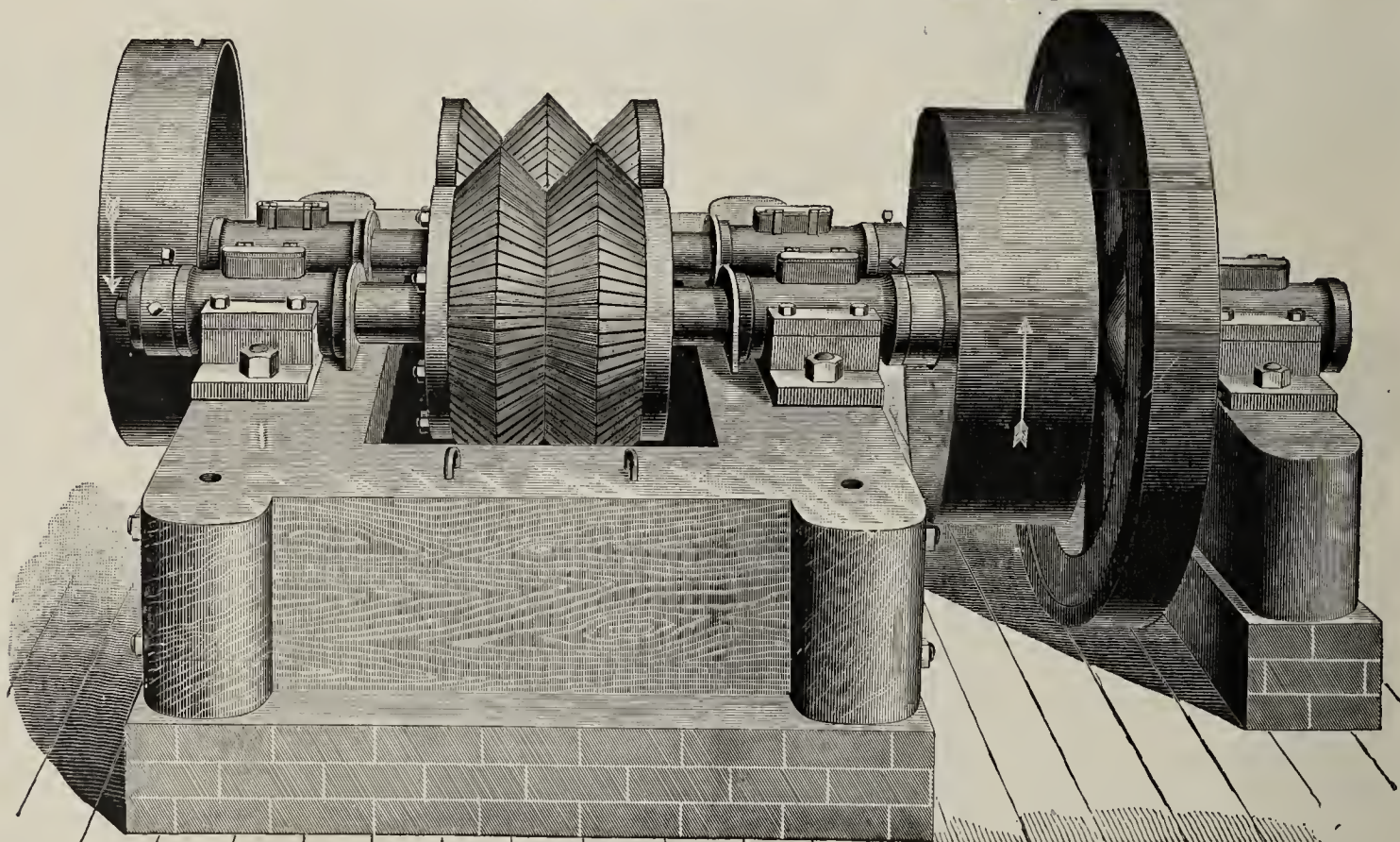
We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

It will afford us pleasure to correspond with you.

Mention the Clay-Worker

NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building, New York, U. S. A.
26 Cortland and 21 Dey Streets,

Brick Moulds at a Discount.

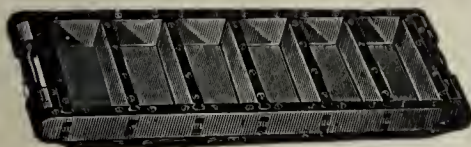
On and after June 1st, you can get 20 per cent off the list on Machine Moulds and other supplies, at reduced prices. If you have not got the LIST, send for it. Address the largest and most complete works of the kind in the world.



3 Brick Hand Mold.



16 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

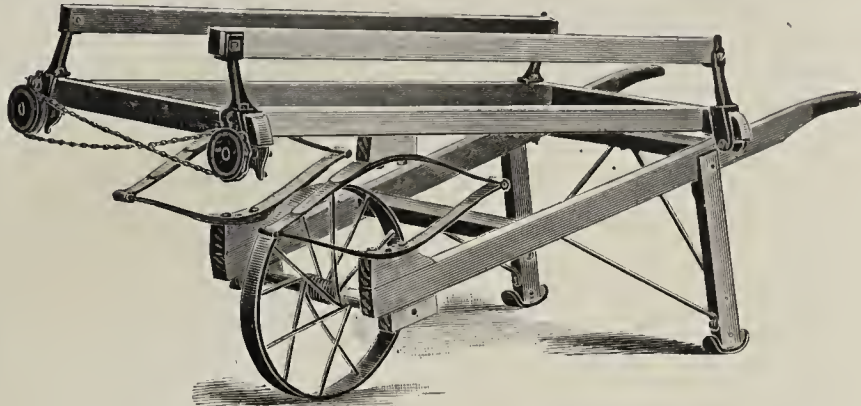
We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

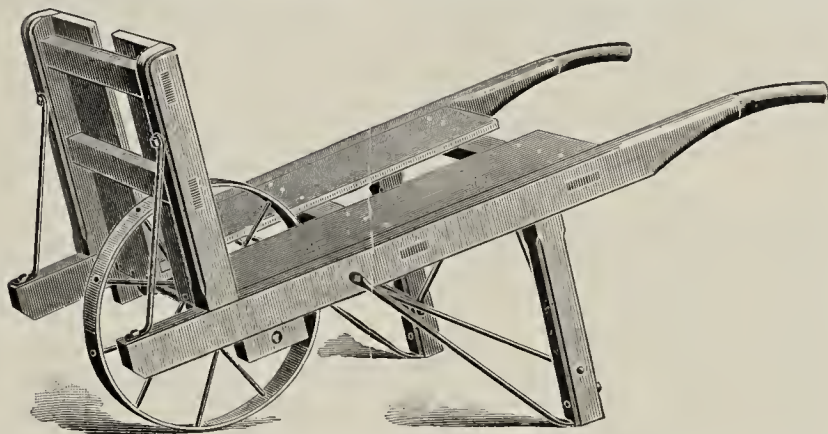
Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

Send for catalogue and price list. Address,
D. J. C. ARNOLD, New London, Ohio.

TRUCKS. A great variety of Styles.

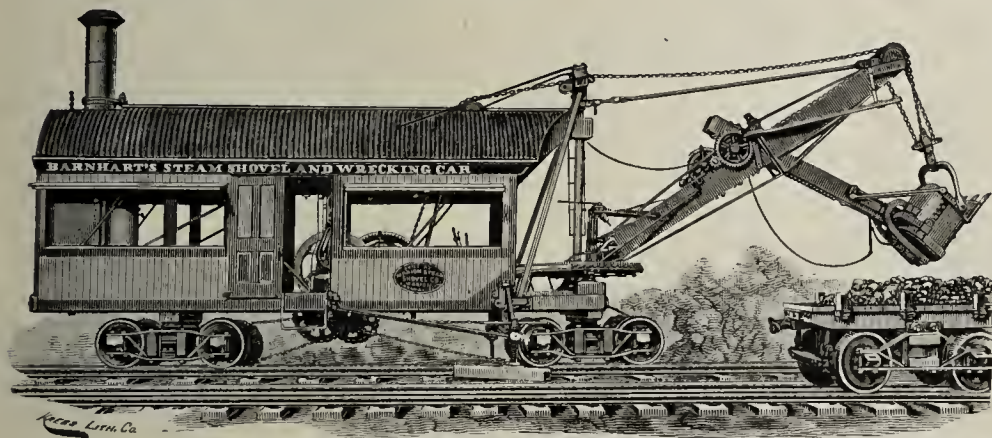


No. 4 Pallet Truck. Handiest and Best Truck in the market. For various purposes. Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind



No. 4 Brick Barrow.

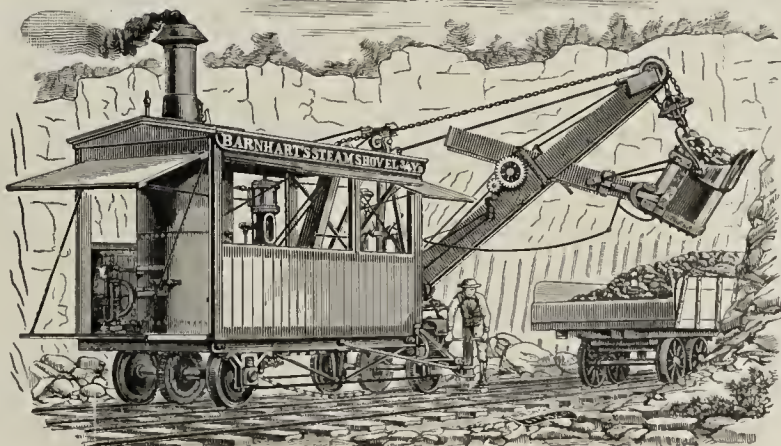
Steam Shovels for Brickyards.



STYLE A-1 1/2 YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1 1/2 yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (3/4 yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.



STYLE C-3/4 YD.

Write for testimonials and illustrated catalogue to

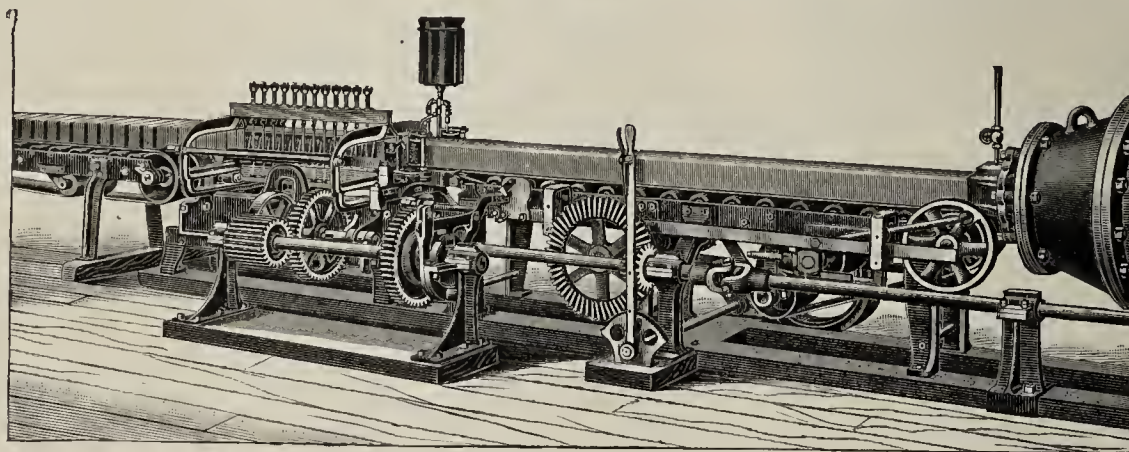
The Marion Steam Shovel Co.,

603 West Center Street, - MARION, OHIO.

Willing Workers.

....

A brick yard equipped with our machinery will fulfill every promise and expectation. Its capacity would be just what it is estimated at, although it would do better. Each machine is a money maker and the best of its kind. Honest material and good workmanship go hand in hand with the excellence of the patents to make them the very best clay-working machines the market affords. Why not let us figure with you on a model plant? Times are improving. The financiers and newspapers all say we are on the eve of an industrial revival. Already conditions are much improved. Why not be ready for the awakening? It costs nothing to talk it over. Write us to-day.



The American Clay-Working Machinery Co.,

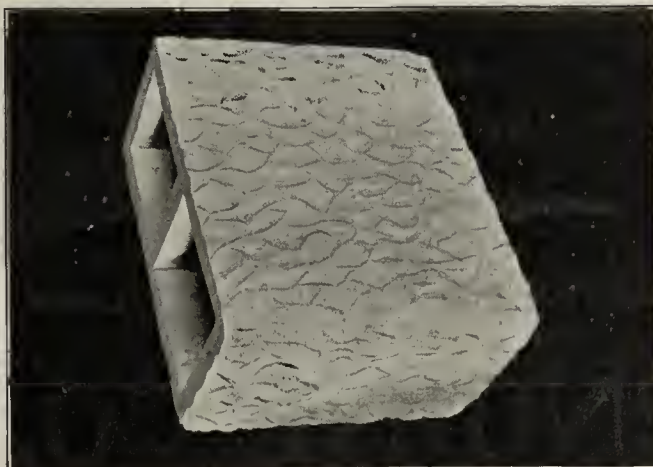
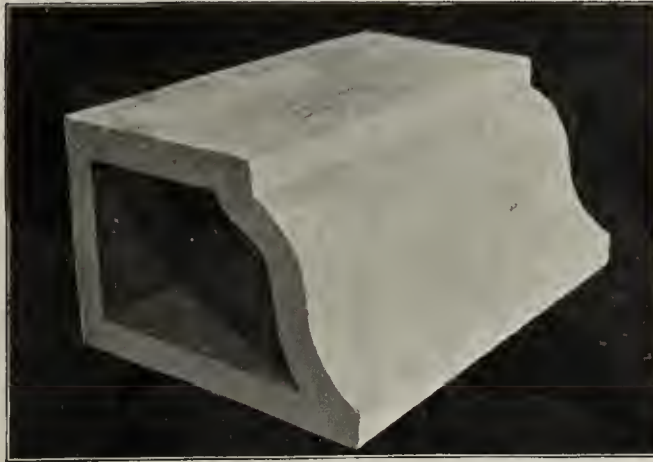
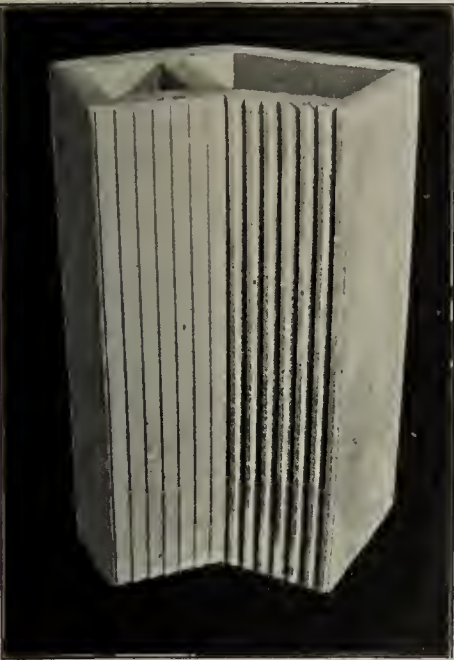
New York Office:

39 and 41 Cortlandt St.,
Room 103.



Bucyrus, Ohio,

U. S. A.



Golden Bricks!

The demand for Hollow Building Block is increasing. In every modern building this material enters largely into its construction. The Durant Hollow Blocks are made exclusively on our machinery. The shapes and styles of this ware are practically unlimited. We can equip your plant for the manufacture of Hollow Blocks at a moderate cost. Write us upon the subject and ask for our new catalogue on the "Hollow Block," just issued from the press of Geo. Holm & Bro.

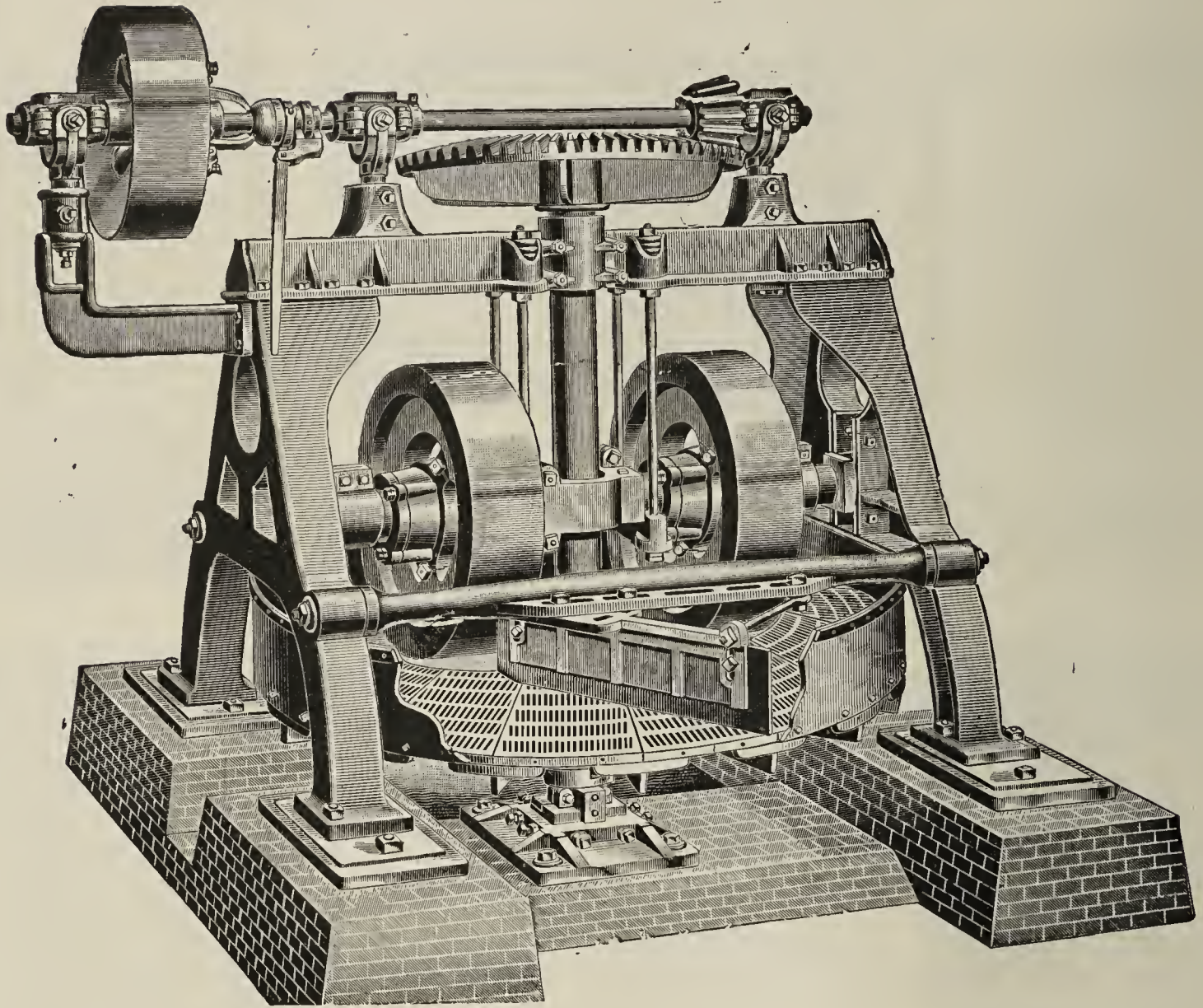
THE
American Clay-Working Machinery Co.

Bueyrus, Ohio, U. S. A.

NEW YORK OFFICE:
39 and 41 Cortlandt St., Room 103.

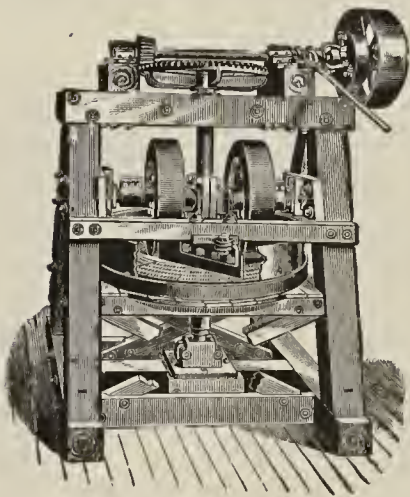


In Writing please say you saw our ad. in the
CLAY-WORKER.



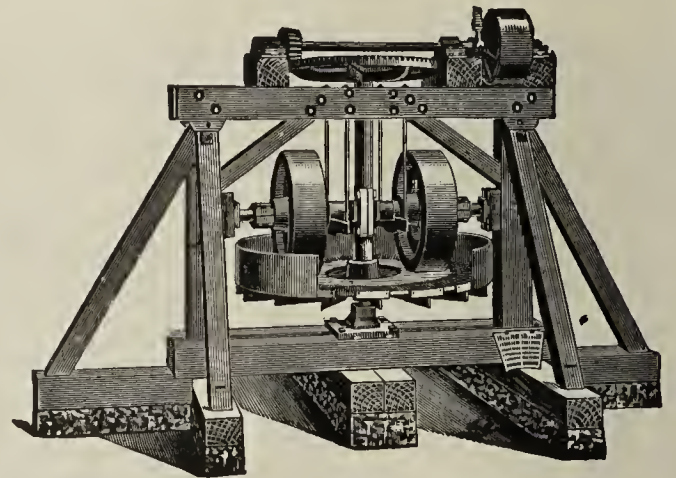
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,
WOOD FRAMES.

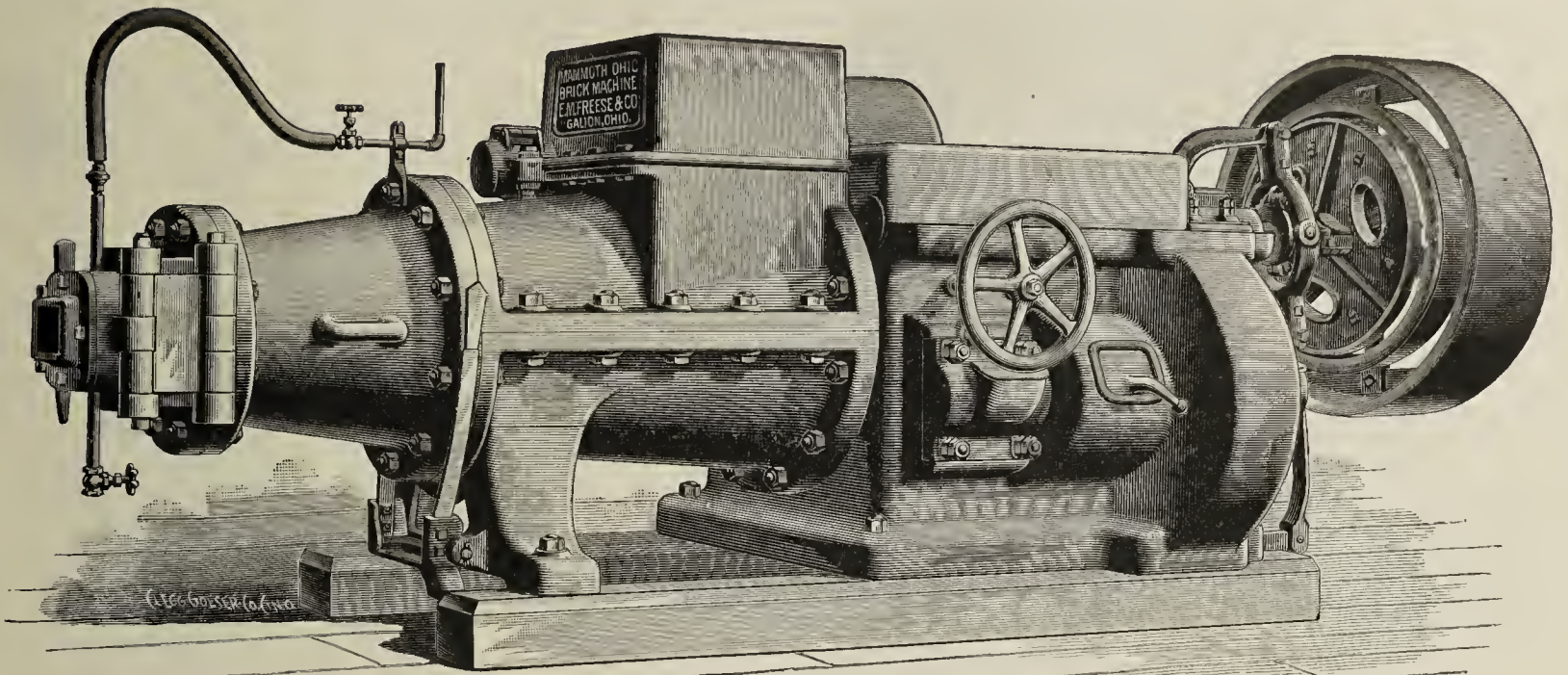
~~~~~  
All Sizes and Price  
to suit  
Any Size Plant.  
~~~~~



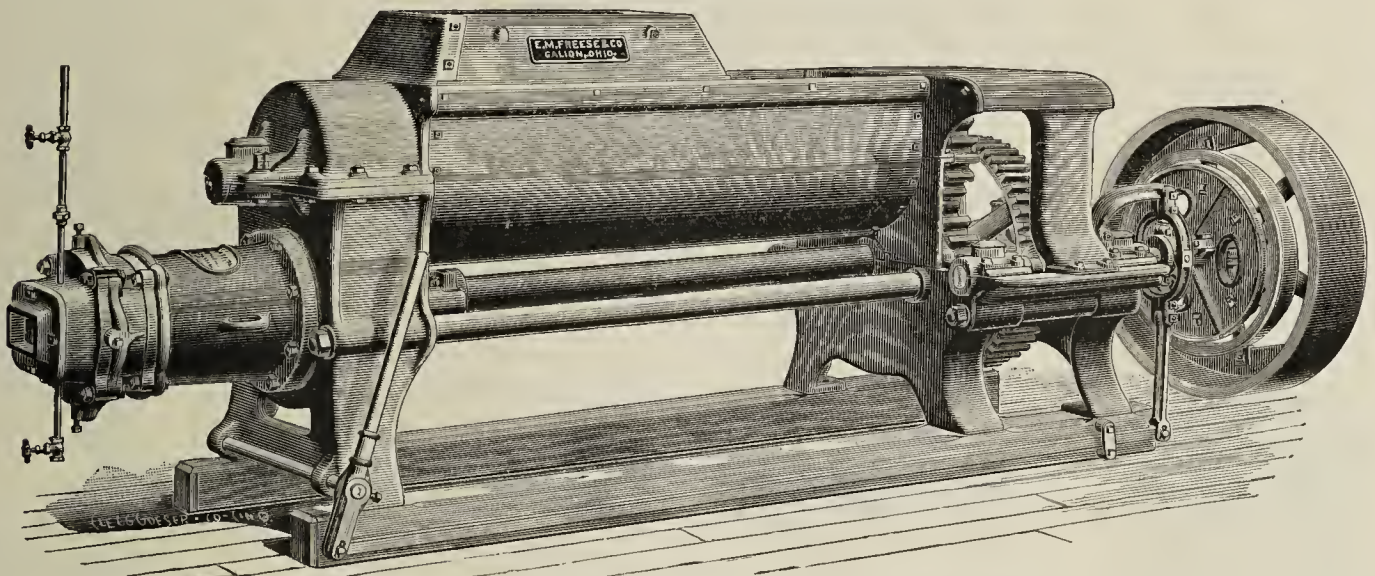
.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.

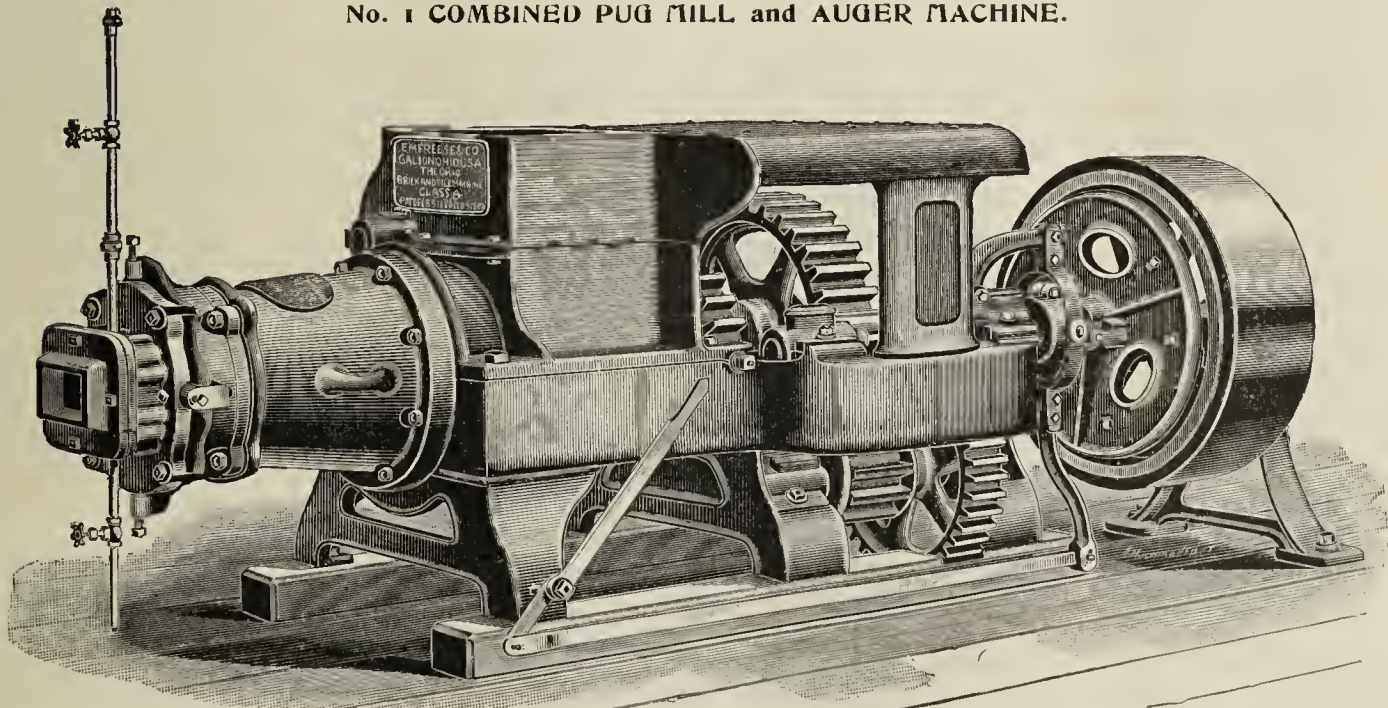
E. M. FREESE & CO., GALION, OHIO.



MAMMOTH BRICK MACHINE.

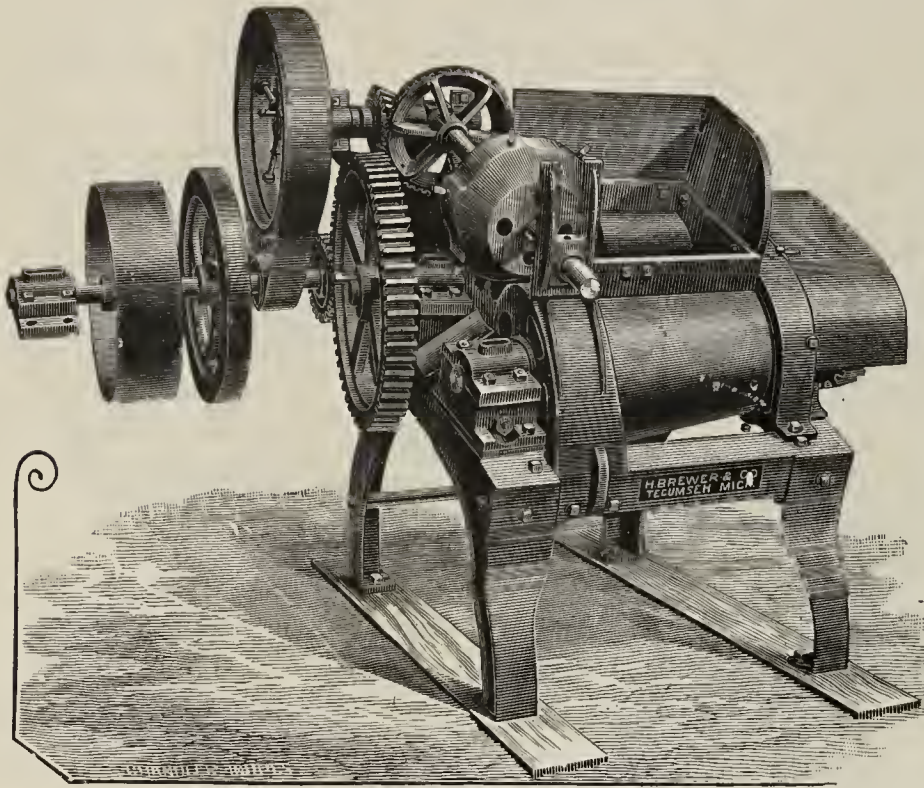


No. 1 COMBINED PUG MILL and AUGER MACHINE.

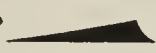


IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

Send for 136 page Catalogue.

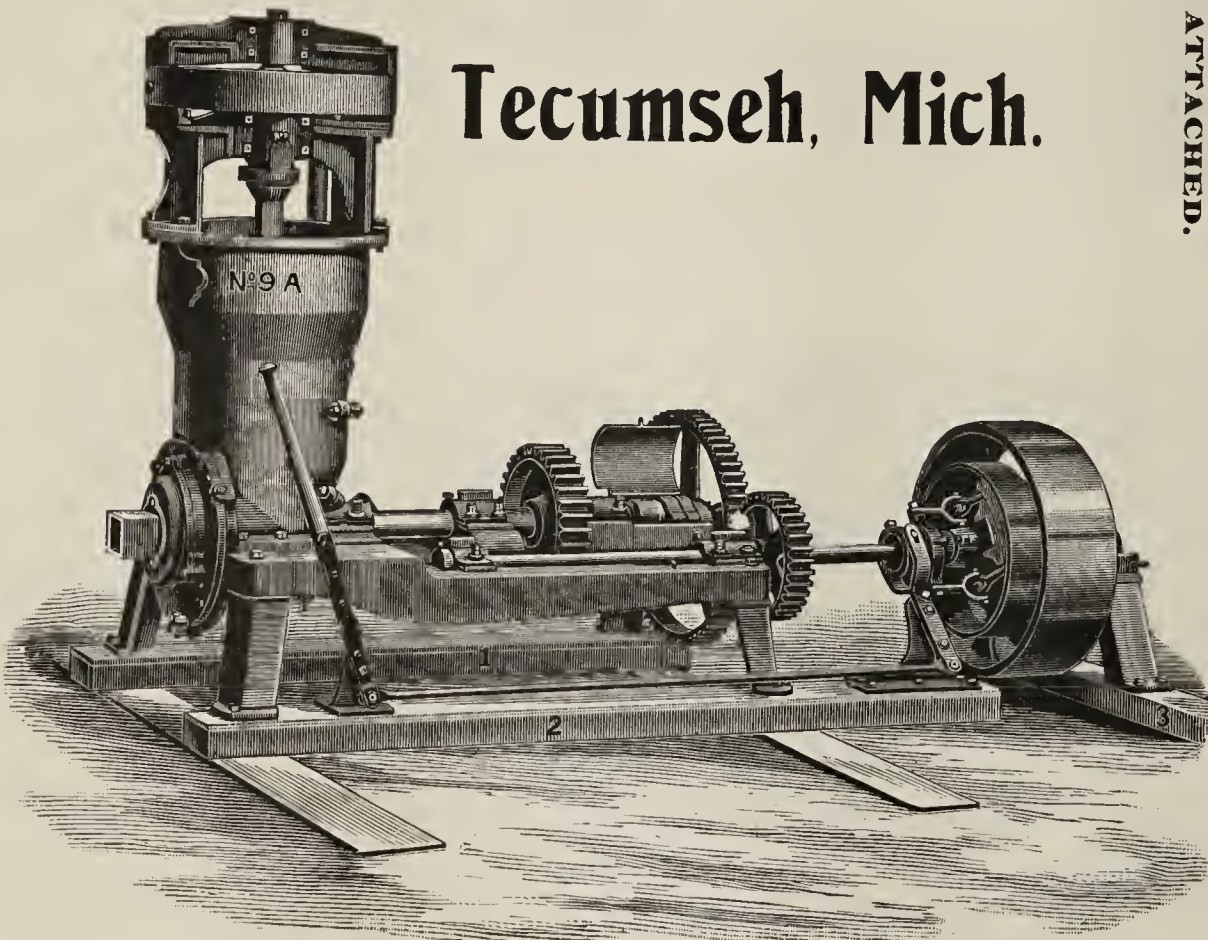


STONE EXTRACTING CLAY CRUSHER.

Manufactured by 

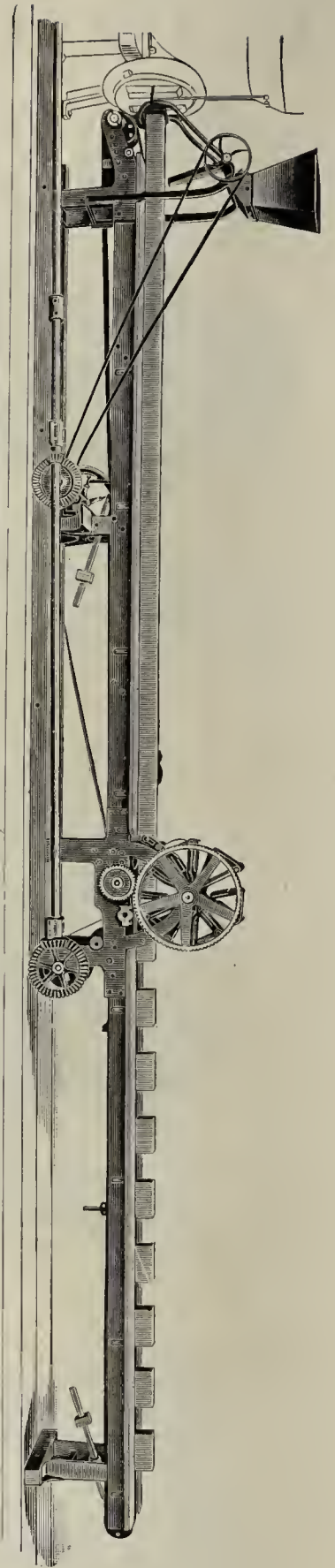
H. Brewer & Co.,

Tecumseh, Mich.

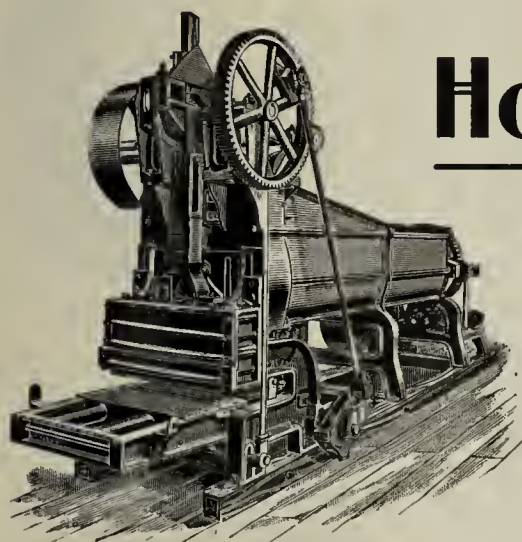


No. 9 "A" BRICK MACHINE.

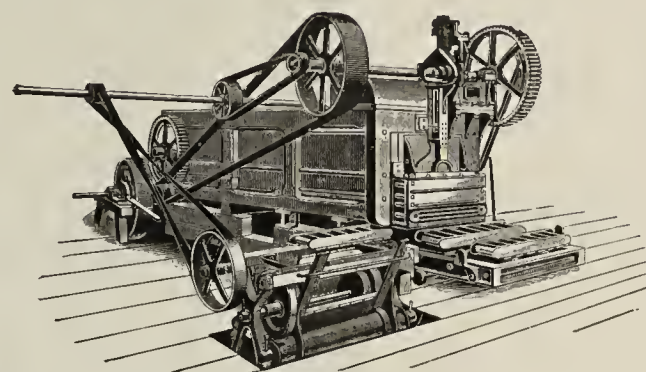
AUTOMATIC END CUT BRICK CUTTER WITH SANDER ATTACHED.



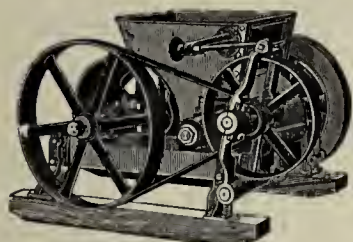
We Manufacture Anything You Need.



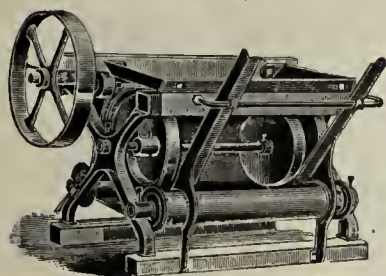
Horizontal Stock



Brick Machines,



(PATENTED.)



(PATENTED.)

*All Iron Vertical Machines,
Disintegrators, Mould Sanders,
Pug Mills for all purposes,
Granulators, Conveyors,
Cars, Winding Drums,*

*Brick Moulds (machine or hand,)
Trucks, Barrows,
Kiln Castings,
Pulleys and Shafting.*

We are prepared to furnish any of the above goods promptly at prices and terms which we know will satisfy you.

If in need of any supplies or Machinery it will pay you to write for prices and terms to

C. & A. POTTS & CO.,

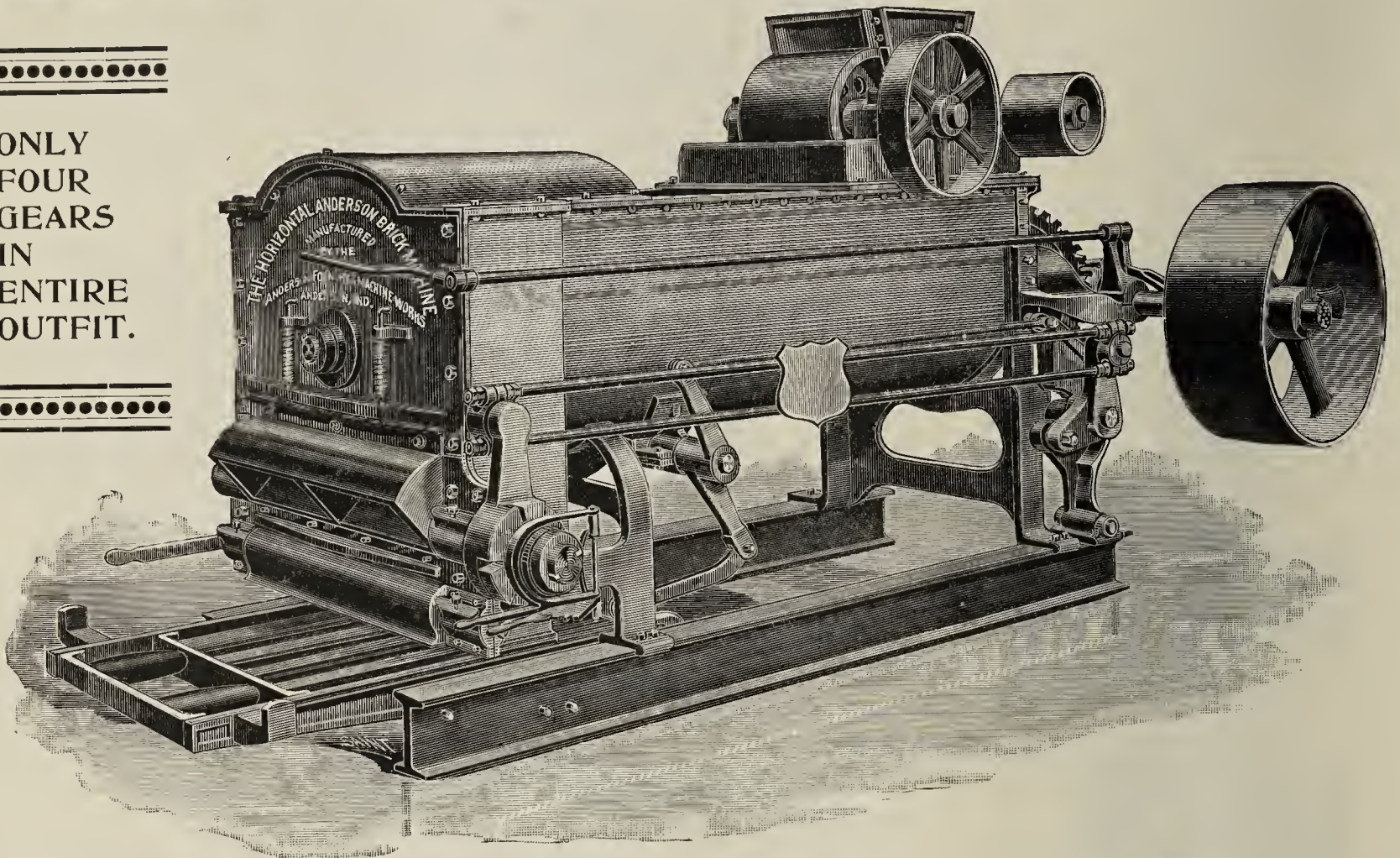
420-428 West Washington St.,

INDIANAPOLIS, IND.

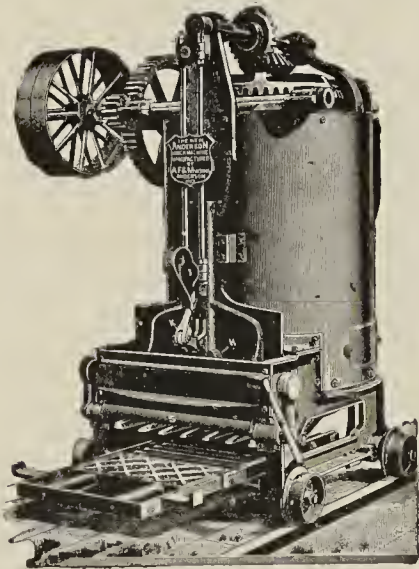
DON'T

Buy a Brick Machine until you Investigate the **HORIZONTAL ANDERSON**. The latest — the Strongest — Greatest Pressure and Puging Capacity.

ONLY
FOUR
GEARS
IN
ENTIRE
OUTFIT.

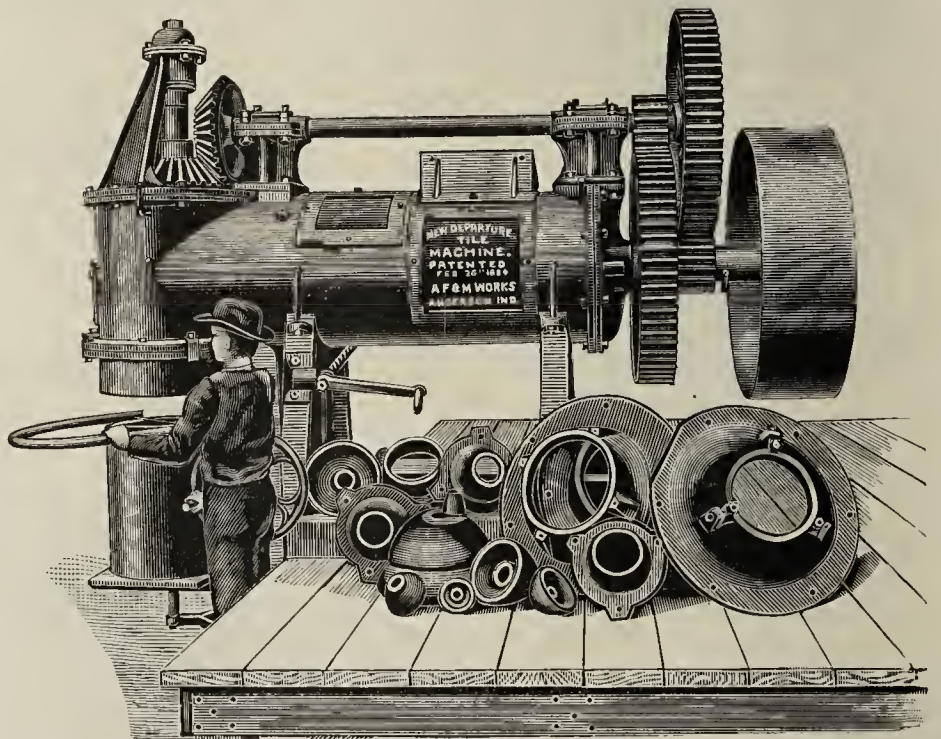


Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

The NEW DEPARTURE TILE MILL.

The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

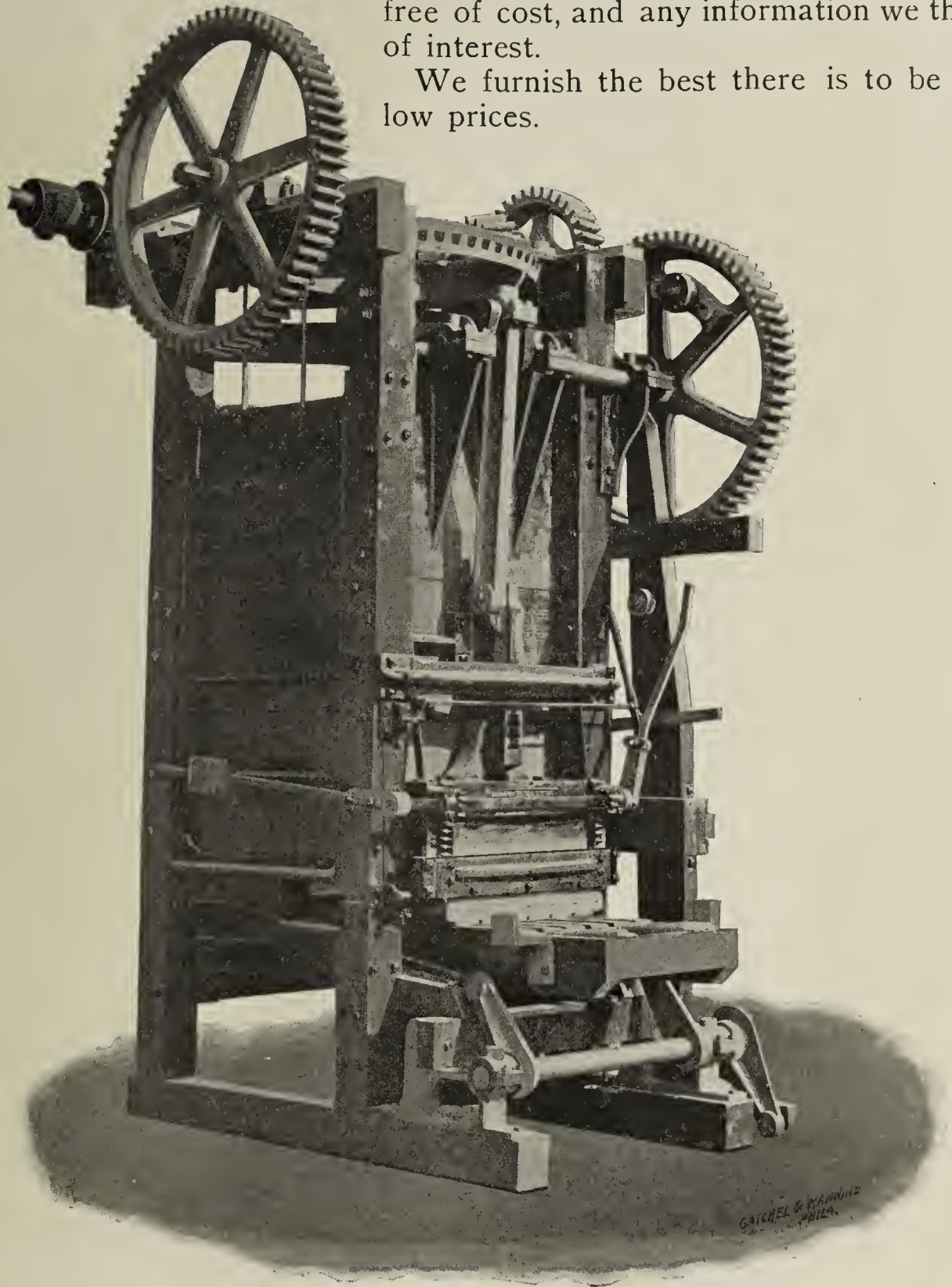
THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana

We Furnish Everything a Brickmaker Needs.

Let us furnish you with any information you want. We send plans of complete plants free of cost, and any information we think will be of interest.

We furnish the best there is to be had and at low prices.



Letter "A" Weight 10,000 Pounds.

ESTABLISHED 1857.

INCORPORATED 1887.

The Henry Martin Brick Machine Mfg. Co.,

Send for our Illustrated Catalogue.

Lancaster, Penna., U. S. A.

“NEW HAVEN” MACHINES

Are Not Experiments.

Record of . .

One Soft Clay Machine:

One Million Brick a Month

. . . for Eight Years. . . .

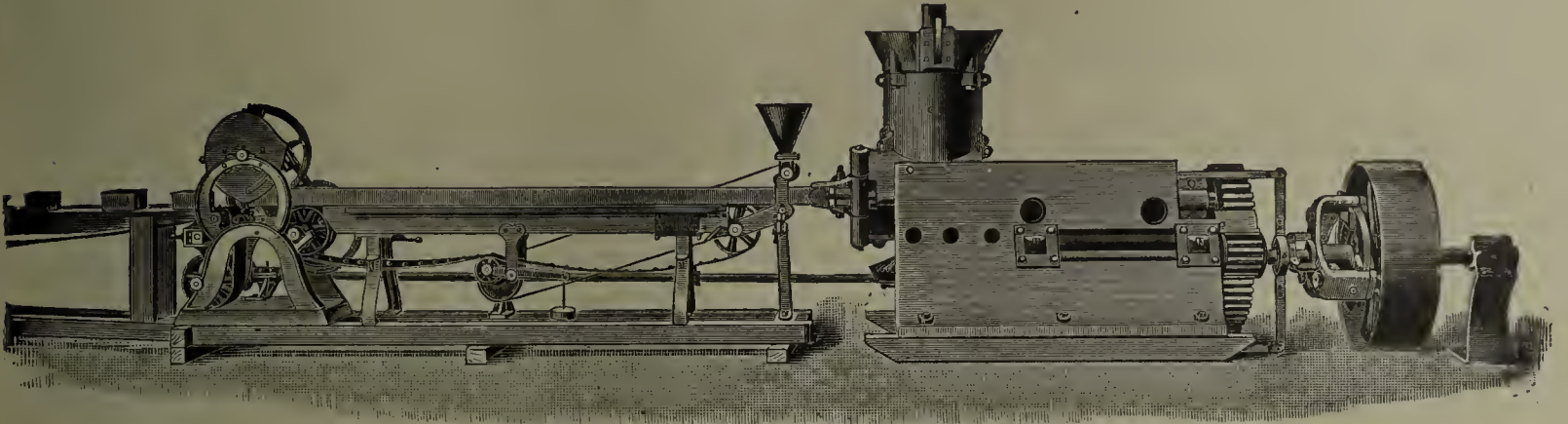
Its History Shows that it Has Been Unusually
Successful.

Address —

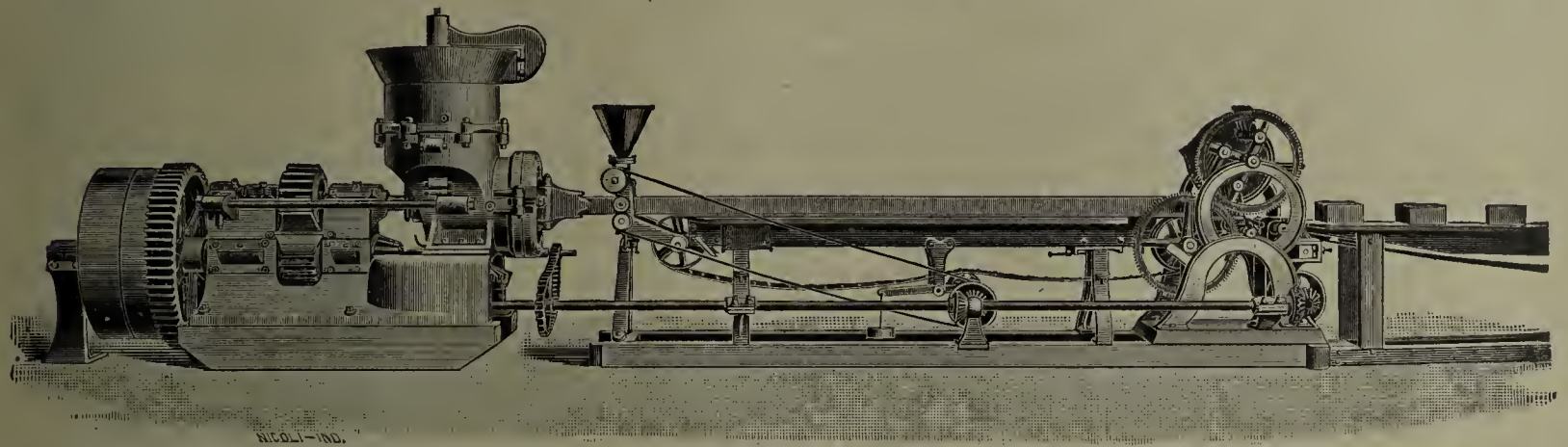
The Eastern Machinery Co.,

NEW HAVEN, CONN.

WONDER MACHINERY.



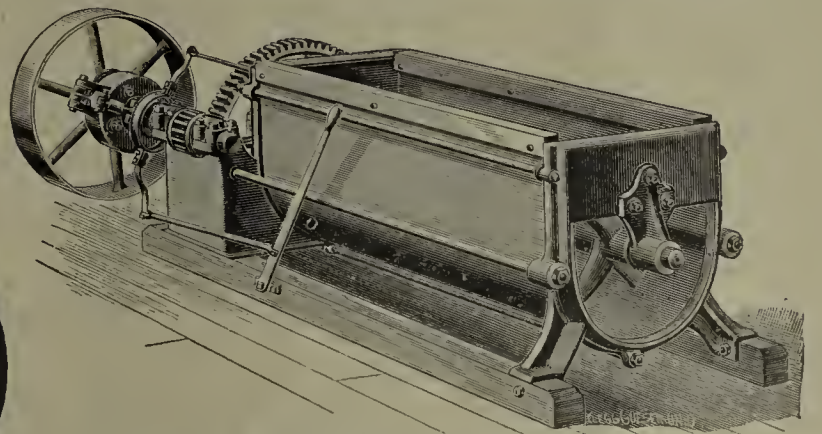
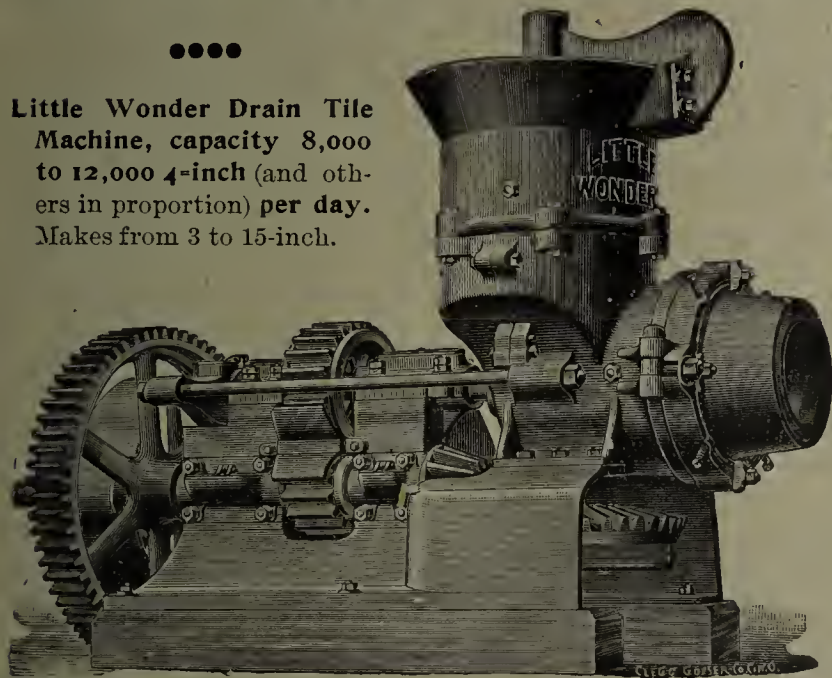
Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.



Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

••••

Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity.

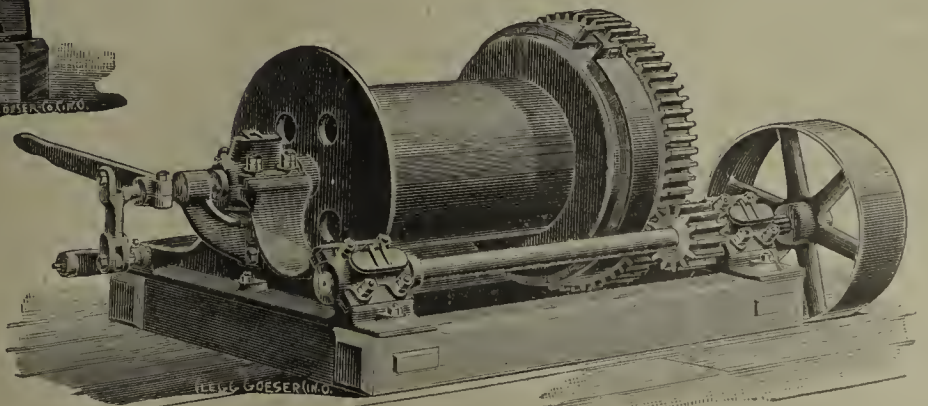
MANUFACTURED BY

The Wallace Mfg. Co.,
Frankfort, Ind.

CHICAGO AGENT:

Chicago Brick Machinery Co., Chicago, Ill.

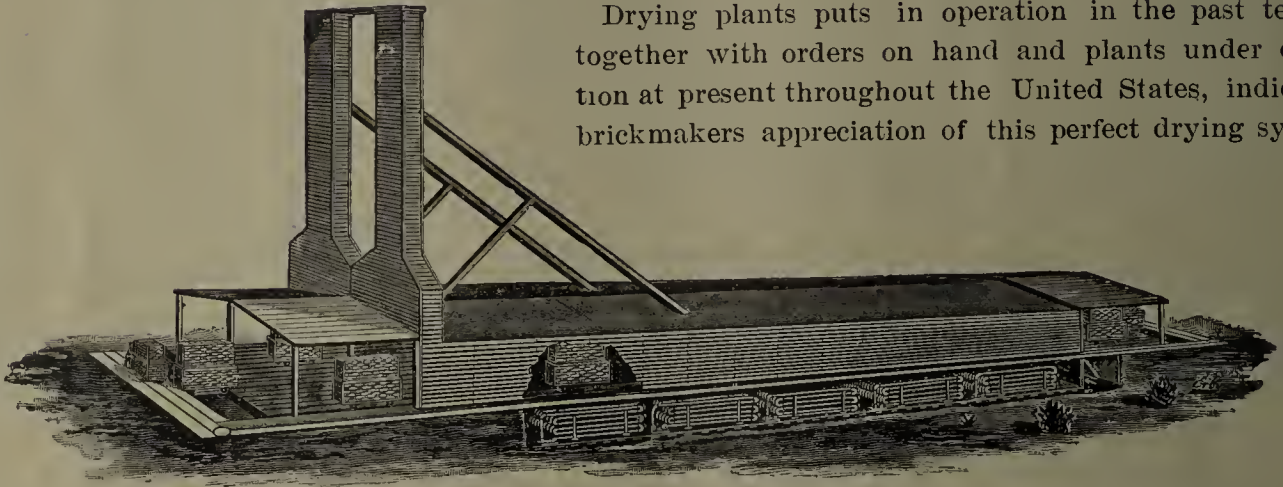
Catalogue Free.



18 x 30 Friction Geared Hoisting Drum.

Iron Clad Dryer.....IN THE LEAD

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

•❖•SEE WHAT THEY SAY:❖•

WM. SANKEY, THOS. SANKEY,
WM. E. SANKEY, F. M. SANKEY,
T. H. SANKEY, J. F. SANKEY.

CAPACITY: 40,000 BRICK PER DAY.

TELEPHONES: { OFFICE, S. S. 11-3.
WORKS, S. S. 11-2.
WORKS, E. E. 589.

SANKEY BROS., BRICK.

ORNAMENTAL PRESSED, SELECT STOCK, BUILDING, PAVING AND GUTTER BRICK.

SPECIAL AGENTS FOR MARTIN'S IMPROVED BRICK MACHINE.
RAILROAD SHIPPING A SPECIALTY.

OFFICE: 2101 Carson Street.

WORKS: Head of 18th Street, S. S.
Penn and Atlantic Aves., E. E.

PITTSBURGH, PA., May 3, 1897.

WOLFF DRYER CO., Chicago, Ill.

Gentlemen:—Replying to your inquiry regarding dry house at our east end plant, will say, that it is two years since we equipped that yard. We found the earthy deposit there would make the best quality of stock brick; soft mud process, but would not stand direct heat drying; such as we were accustomed to use, therefore concluded to test this brick in your dryer, resulting in our installing your system, producing results of a most satisfactory nature, proving the excellence and correctness of your system of absorbing moisture from centre to surface by drawing a volume of warm air through the brick, carrying off the moisture and leaving our brick perfect and bone dry, saving us money in burning and producing beautiful color.

Six months experience proved to us that it would pay to install your system at our South side works, which we did one year ago, with equal satisfaction. At this yard, we have shale clay manufacturing soft mud and dry-press brick and was equipped with the best kind of dry floor, heat supplied from natural gas; we sacrificed this and built an Iron-Clad under the same roof. This loss has been our gain; the quality of brick and saving in cost of drying enables us to show a fair profit, which is very pleasing, considering prevailing low prices for brick. We dry all our dry-press brick before setting in the kiln.

Respectfully yours,

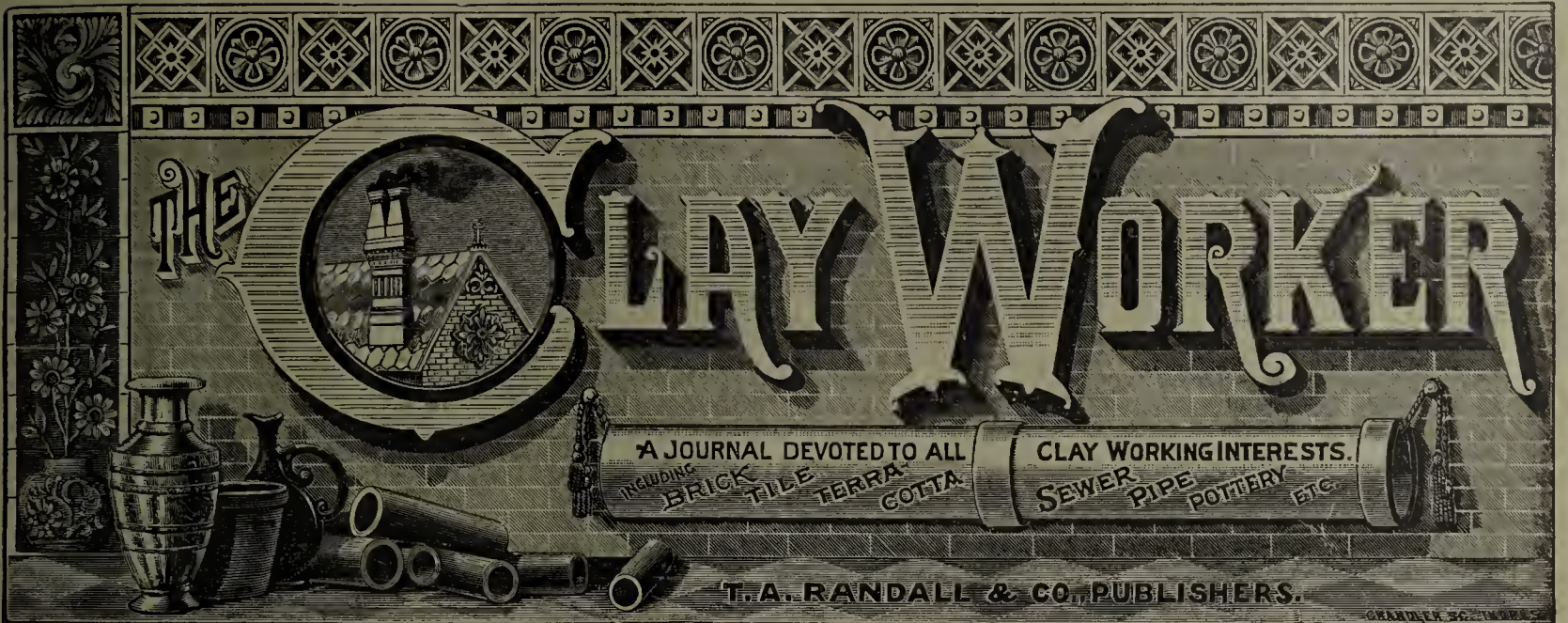
SANKEY BROTHERS.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

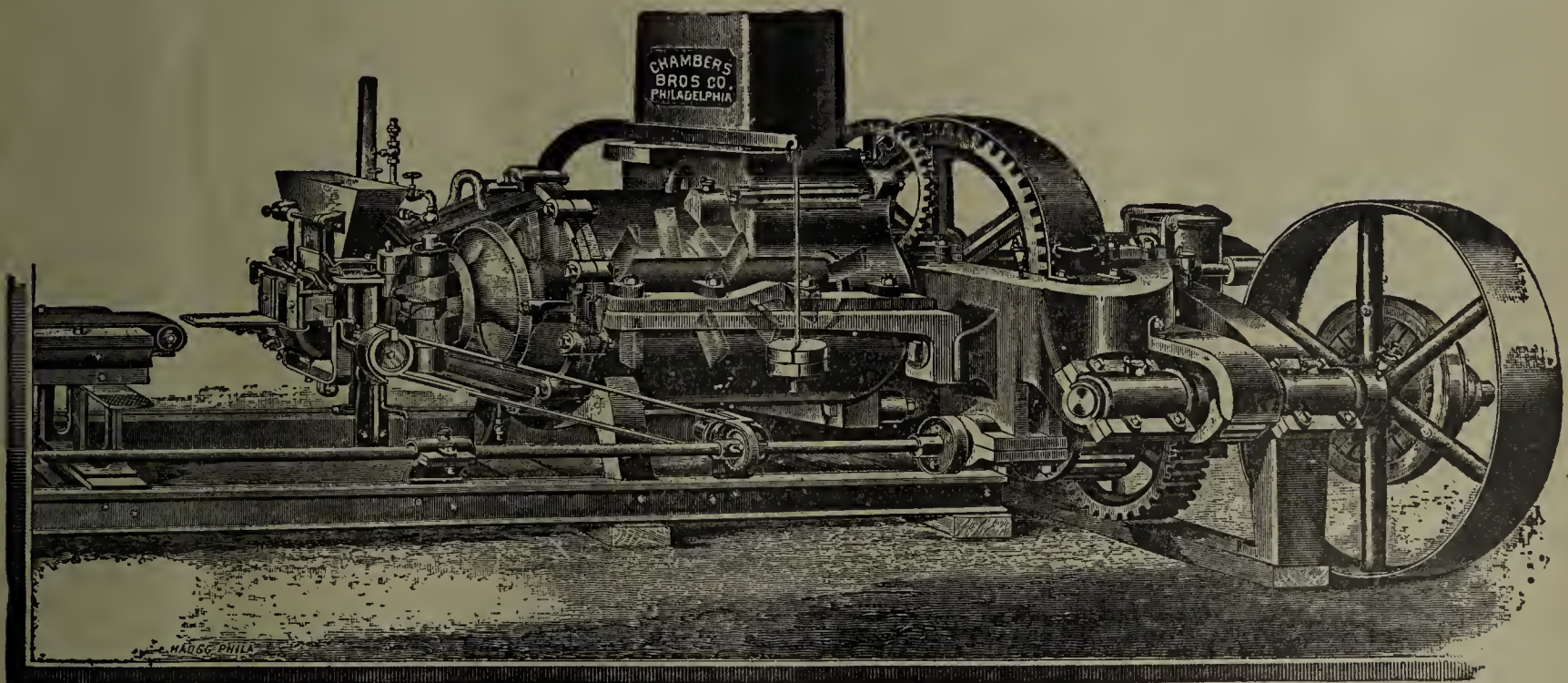
VOL. XXVIII, No. 1.

INDIANAPOLIS, IND., JULY, 1897.

\$2.00 a Year in Advance.

OUR SPECIALTY IS STIFF TEMPERED BRICK MAKING ...MACHINERY.

We aim to Build only the Best in its Class.
It has Paid our Customers to Buy and Use our Machines.
We Believe it would Pay You.



Chambers Brothers Company,

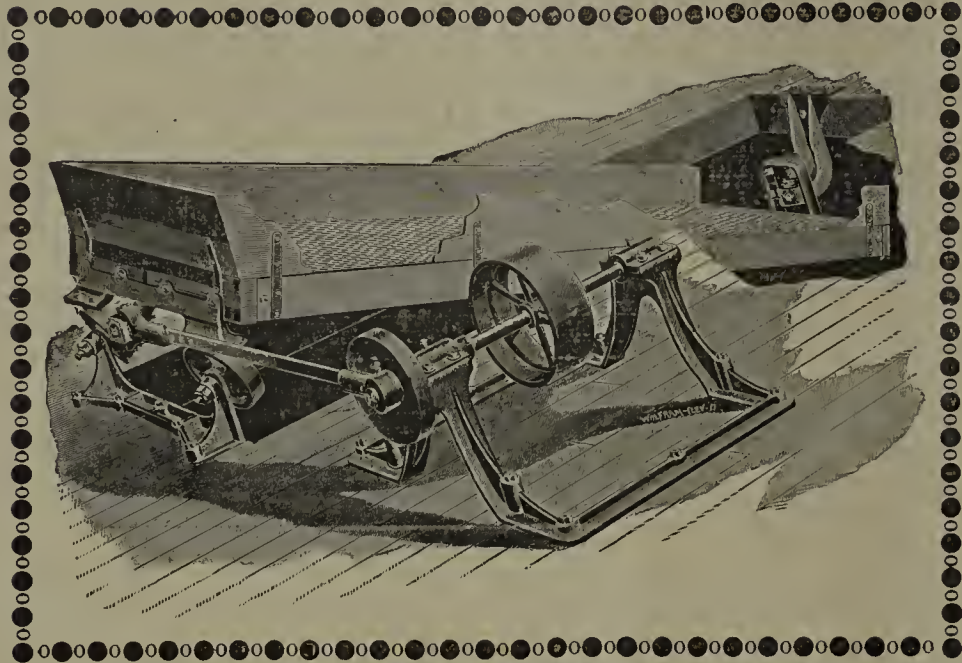
FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,

171 South Clinton Street.

PHILADELPHIA, PA.

A Screen Ordinance



Is doubtless wise legislation in many places to keep certain persons within the limits of the law; but a screen ordinance to be of benefit to clayworkers should require all those who make brick or other product from shale or fire clay to place between the pulverizer and brick machine a **Richardson Shaking Screen**.

The penalty for not complying with such an ordinance would be self-imposed, namely, a poor product or small output with constant trouble and expense for repairs.

Of Screens there is only one best and we have it. If you want to know more about this send for descriptive circular, and our little book on "Screening Clay."

The Ohio Ceramic Engineering Co.,

59-63 Center Street,

CLEVELAND, OHIO.

Don't Monkey With Poor Machinery,



Or you will get yourself in trouble, just as the monkey did when he rang the fire bell, and every one will know you are in trouble, too. A broken down machine some how has a voice that reaches all your neighbors. It is like the fire bell.

Don't think a poorly built machine is economical because it is cheap. There never was a greater mistake. If you must have something cheap, buy a second hand machine of first-class make. It will pay you better in the long run.

We furnish you only good reliable machines, well built; machinery that will not get you into trouble. Cheap too; just as cheap as good machinery can be built under the most favorable conditions.

Chicago Brick Machinery Co.,

225 Dearborn Street.

THE HARRINGTON & KING PERFORATING CO.
CHICAGO, ILL.

THE H. & K. P. CO.
PERFORATED SHEET STEEL
FOR
CLAY SCREENS

SEWER PIPE
BRICK
FOR CHUTE
SCREENS.

FOR
DRY PAN
SCREENS.

TERRA-COTTA
FOR REVOLVING
SCREENS.

Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.

IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

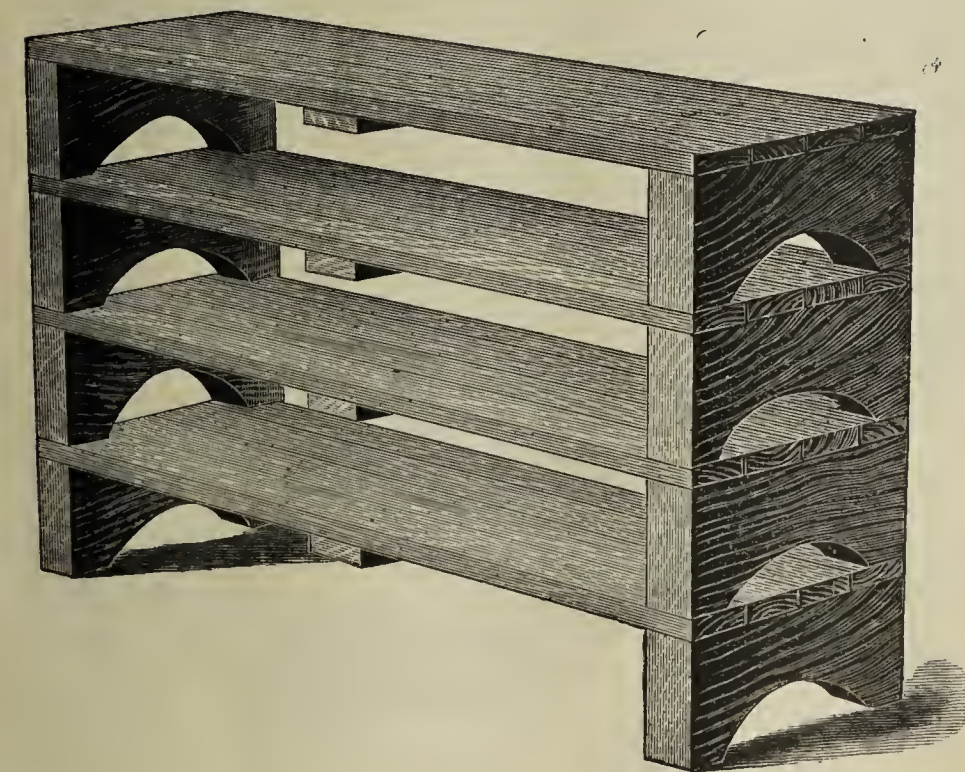
Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.



Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

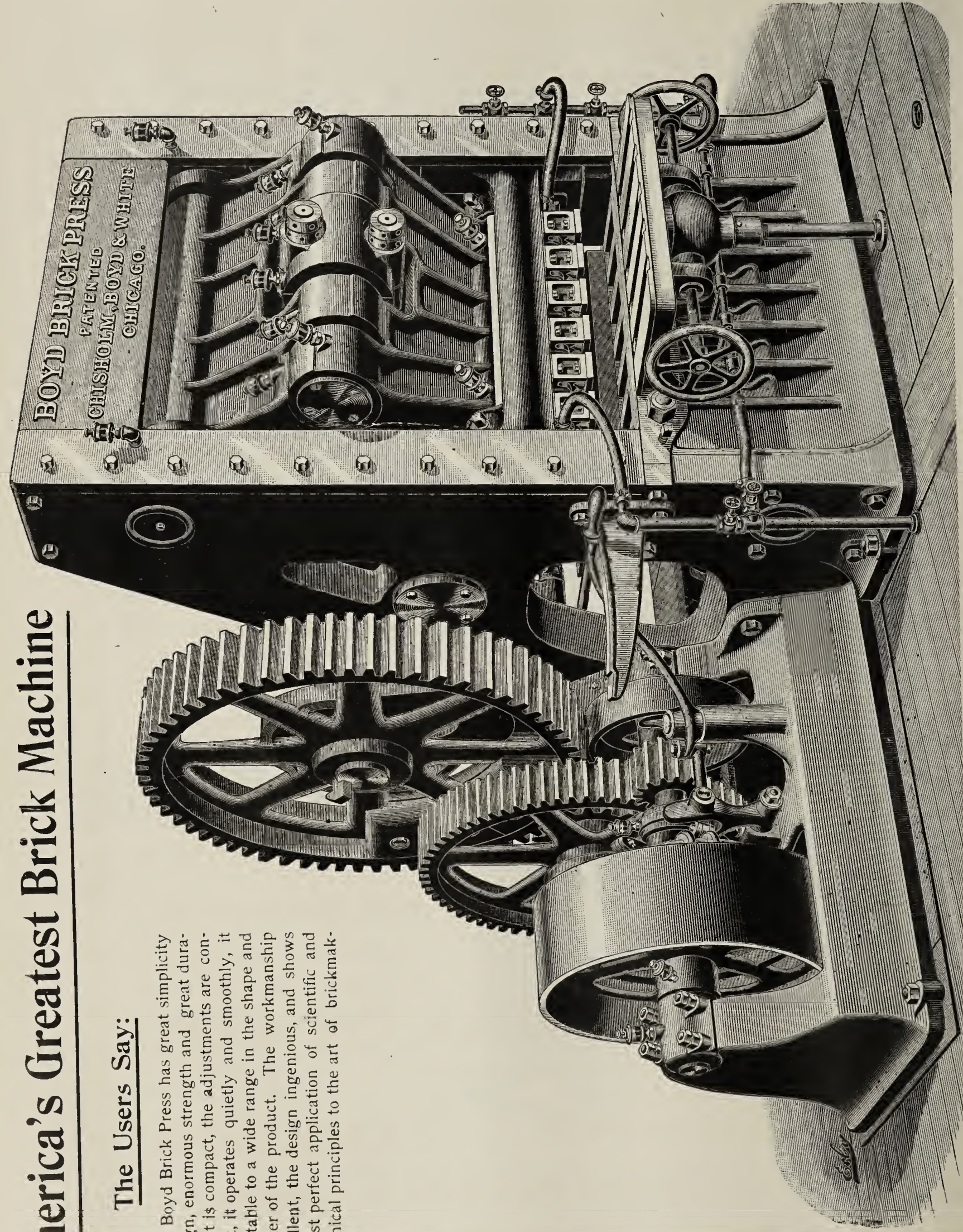
W. B. MERSHON & CO., - Saginaw, East Side, Mich.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."

THE CLAY-WORKER



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

"The Survival of the Fittest."

WE ARE IN THE BUSINESS TO STAY AND WILL NOT BE UNDERSOLD.

....

CLAY WORKING MACHINERY

The Simpson Brick Press

The World's Standard.

....

Used by all Successful Brick Yards Throughout the United States and Canada.

....

We Manufacture a Complete Line of Clay Working Machinery.
Write for Catalogues.

....

DO NOT EXPERIMENT.
INVEST YOUR MONEY IN A SURE THING.

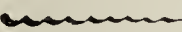
....

Complete Plants Constructed and Guaranteed.

....

The Simpson Brick Press Co.,

Manufacturers and Contracting Engineers.

OFFICE AND WORKS: 

77th and Jackson Ave. (Formerly Storms Ave.)

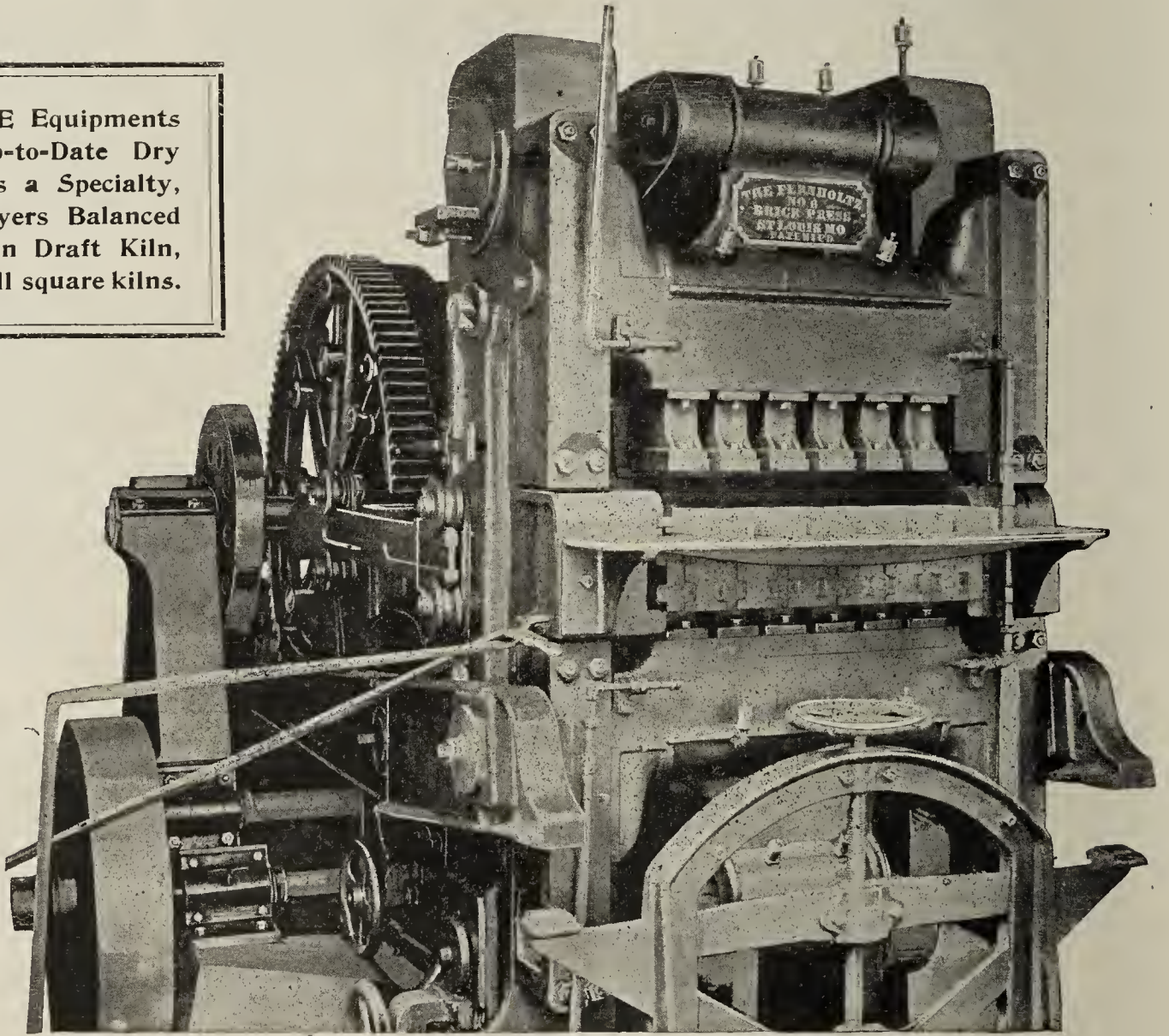
CHICAGO.

AGENTS FOR CANADA: WATEROUS ENGINE WORKS CO., Brantford, Ont.

The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMPLETE Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

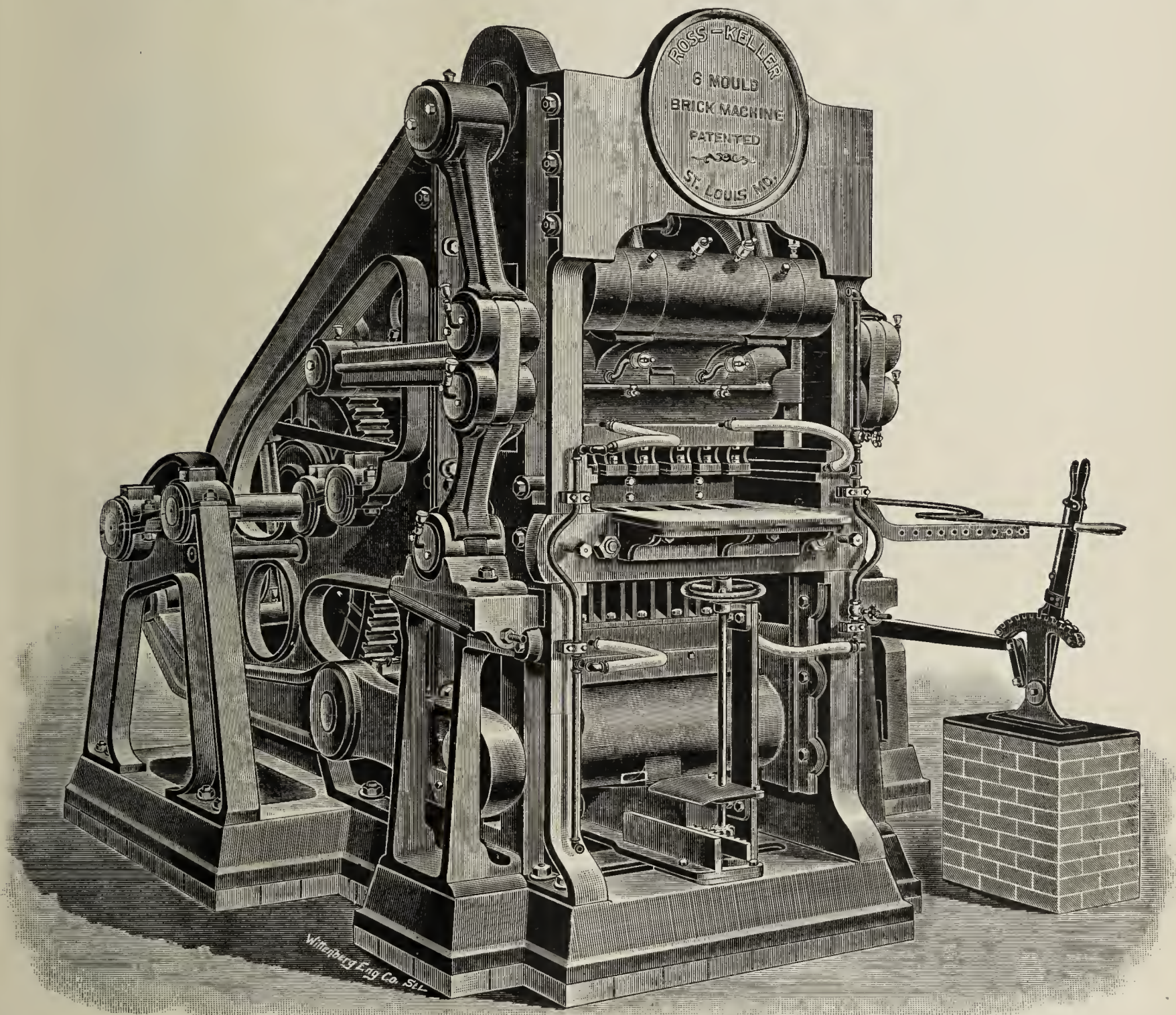
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

—ST. LOUIS, MO., U. S. A.

"A Clay Pulverizer of Wonderful Capacity"

SO SAY ALL WHO HAVE USED IT.

St. Louis, June 4th, '97.

Messrs. MILTON F. WILLIAMS & CO., City.

Gentlemen:--You undoubtedly remember the difficulty you had in interesting us in your "Pulverizer."

We thank you for your persistency as it caused us to purchase one of your PULVERIZERS which has proved itself to be all you claimed for it.

It grinds our BURNT POT CLAY to our entire satisfaction and in a manner superior to any we have seen.

We cheerfully recommend your pulverizer to all who may have use for it.

Yours truly,

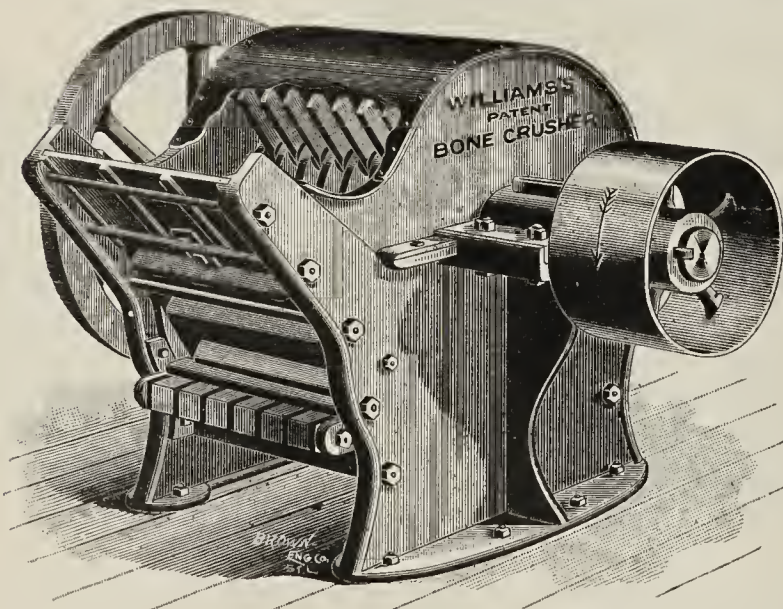
JAMEISON-FRENCH FIRE CLAY CO.,

E. E. French, Sec. and Treas.

We can send you many more like this.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

Our Pulverizer is fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.



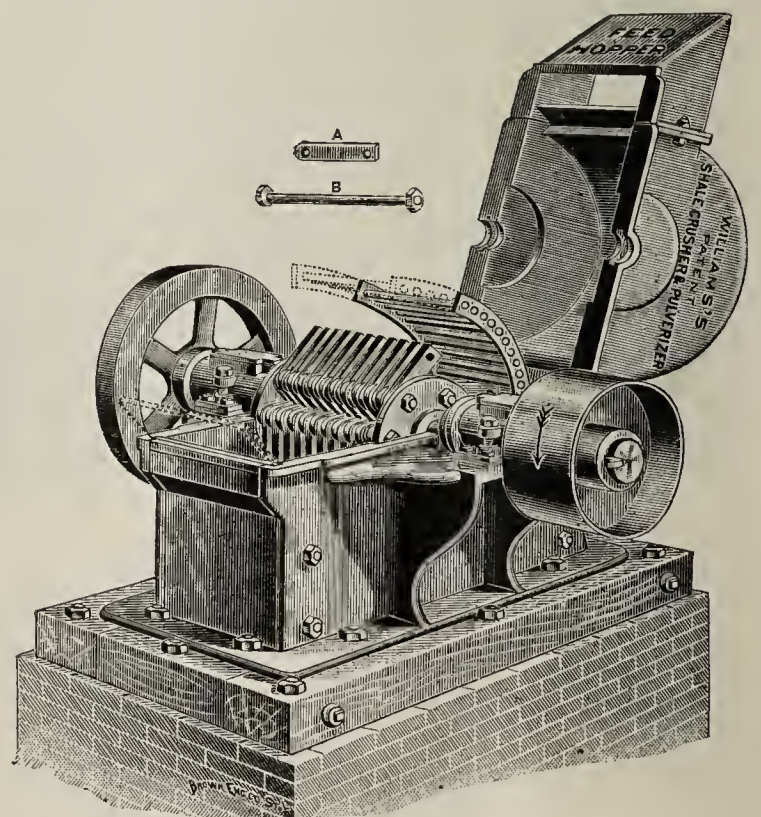
Williams's Shale Breaker.

THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

The Williams Patent Crusher and Pulverizer Co.

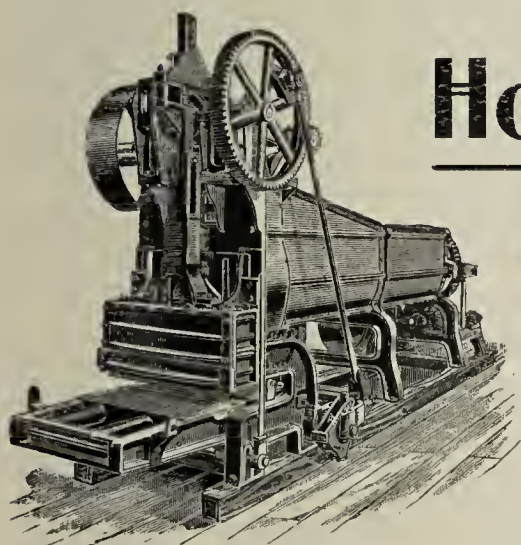
2705 North Broadway, - - St. Louis, Mo.



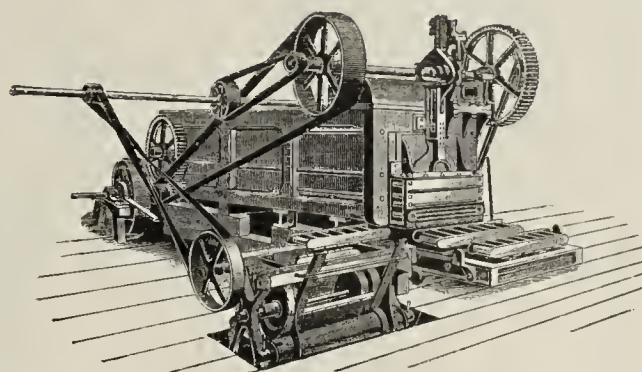
Williams's Shale and Clay Pulverizer.

With Clay Steamer Attached.

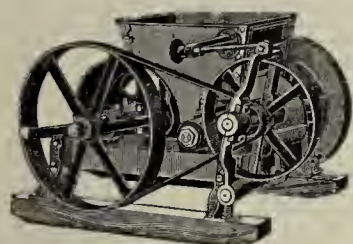
We Manufacture Anything You Need.



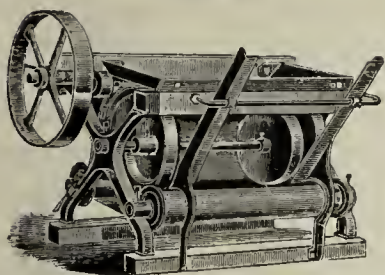
Horizontal Stock



Brick Machines,



(PATENTED.)



(PATENTED.)

*All Iron Vertical Machines,
Disintegrators, Mould Sanders,
Pug Mills for all purposes,
Granulators, Conveyors,
Cars, Winding Drums,*

*Brick Moulds (machine or hand,)
Trucks, Barrows,
Kiln Castings,
Pulleys and Shafting.*

We are prepared to furnish any of the above goods promptly
at prices and terms which we know will satisfy you.

If in need of any supplies or Machinery it will pay you
to write for prices and terms to

C. & A. POTTS & CO.,

420-428 West Washington St.,

INDIANAPOLIS, IND.



The Price

Of a thing is generally fixed by its worth.
Swamp land is cheaper than a fertile farm.

Clothes made of shoddy cost less than
garments made of wool.

This is because they are worth less.

It is one of the eternal impossibilities of
the world to buy good things at the price
of bad things.

The STANDARD IMPROVED BRICK AND TILE DRIER

Is not a cheap Drier in the sense of being sold at a cheap price. It is, nevertheless, the cheapest Drier on the face of the earth. It costs a little more than some in the beginning, but the real economy of it shows in the end.

It is intended for Brick and Tilemakers who want a Drier that can be adapted to most any kind of clay. It does its work just as well in the North as in the South—in the East as well as in the West.

The method of drying is continuous. **The Standard Drier** works all the time. It never gets tired, and, if treated right, repairing days are very rare.

It is simple—there is no unnecessary mechanism or complications about it to hinder and annoy. Any man with common intelligence can operate it.

It does its work right. It is economical with steam. It will dry your ware just as rapidly as the nature of your clay will permit.

We have a 124 page catalog, full of descriptions, illustrations and testimonials from every section of the country. This book is rather expensive and we do not care to waste a single copy. We will however, be pleased to mail one to each reader of the CLAY-WORKER who is interested enough to ask for one.

....

The Standard Dry Kiln Co.,

186 South Meridian St.,

INDIANAPOLIS, IND.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVIII.

INDIANAPOLIS, IND., JULY, 1897.

No. 1.

Written for the CLAY-WORKER.

AMERICAN ARCHITECTURE IN CLAY.

THE ACCOMPANYING illustrations are taken from photographs of two residences, located at 6040 and 6042 Ellis avenue, Chicago. These houses were built under instructions of a brick dealer who believes that clay product is the best material extant from which any building can be constructed. These buildings are unique of their kind, in so far as I know, in the fact that brick and mortar are the only materials used in the construction of walls, starting from the foundation footings, which are of concrete.

The basement walls are constructed of hard burned builders, laid in concrete made from one-third English Portland cement and two-thirds sharp sand. The front brick used are impervious to water on their face, and are laid in mortar covering the entire side surface of the brick (spread joint, no buttering.) The water table course is of one-inch radius "bull-nose"

brick, laid on edge and projecting one inch over basement wall. From the water table to first floor course a thoroughly vitrified rock-faced brick, of a very dark, variegated color, is used. The belt

course, that runs just under the windows and forms the window sills, is of the same "bull-nose" brick as used at the water table. Above the basement story the brick are of a slightly speckled, pinkish buff, fire-flashed, and not sorted to shade. The trimmings about the front entrances are of the same dark, rock-faced brick as used in the basement story, as is also the belt course below the third-story windows and the dark brick used in forming the diaper work above, worked in with plain brick used in the front. The coping is made of Roman brick

(12x4x1½ inches) laid on the flat in concrete made of half and half Portland cement and sand.

The most unusual and attractive feature of these residences is the porch and steps, which are constructed of brick. The platforms and treads are of 12 x 2½ x 4-inch brick, laid on edge in concrete being supported by an arch. By reference to small illustration showing the details of the porches your readers will be referred, and may see the construction, which the illustration makes very distinct.



A BRICK MAN'S BRICK HOUSE.

It is the intention—which is in accordance with the original design—of the owners to include a veranda of brick over front porches, with brick columns, lintels, etc., which will, when

done, give the face of the buildings a more pleasing and finished exterior.

These residences were built two years ago, and owing to the remarkably good qualities of the brick, their hard surfaces and resistance to water, I am able to say that the brick in constant use in treads and platforms of the porches are as perfect as those in the front proper, showing no discolorations from dirt and no imperfections from wear.

I think these buildings are good examples of what can be done with brick alone in the construction of fronts, foundations and walls, and might be noted by brick manufacturers and dealers, especially when they are building for their own use, thereby furnishing illustrations and suggestions for others to do likewise, all of which will tend to increase the use of burned clay.

I will only add to this that these buildings are suited to crowded city streets, where lots are small and houses must of necessity stand shoulder to shoulder. They have been much admired as specimens of city houses where little or no opportunity was given for architectural design. Of course, much more elaborate effects could have been produced by the use of ornamental brick and terra cotta, if more ornamentation and adornment should be desired in the construction of other buildings, and still adhere to the use of clay products only.

FAX.

Written for the CLAY-WORKER.

CLAY POTS FOR GLASSMAKERS—SOLUTION OF A DIFFICULT PROBLEM.

“THE MANUFACTURE of glass would be a very simple and economical process if it were not for the fact that the pot goes into the glass about as fast as the glass into the pot.”

Such was the half-humorous remark of an old-time manufacturer of glass, who stood meditating above a sorry lot of honeycombed and abandoned glass pots, that looked very much as though they had been food for worms. We could hardly wonder at his dejection when he told us that no one of the ruined pots had been in service over two months, though they had been made on his own grounds, by his own workmen and out of the best clay procurable.

“You can’t get such clay nowadays as we used to get,” he continued; “good old German clay, and we are always in trouble from the short life of our pots. It is the greatest vexation we have to face. You might expect a tin pail to last as long as these worthless things.”

For some time he continued to abuse American clay and the producers of clay, recalling the good old days when a glass pot would outlive the year and still be serviceable. We listened patiently to his complaints, and, having been called upon to help him out of his trouble, undertook the investigation, the results of which it may be of interest to record.

We had long been aware that this cry about the superiority of the “good old German clay” was all nonsense, and that the trouble, in most instances, did not lie with the clay at all. However, since poor clay makes a bad pot, we began with an investigation of the raw clay in the pothouse. We found it to be a standard clay of the very best quality, clean, evenly ground and washed, and showing, upon complete analysis, the following figures:

Water	9.10 per cent.
Silica	61.80 per cent.
Alumina	25.02 per cent.
Oxide of iron.....	2.28 per cent.
Lime, CaO.....	traces.
Magnesia, MgO.....	0.45 per cent.
Alkalies	1.35 per cent.

100.00 per cent.

The total fluxing constituents, including iron, lime, mag-

nesia and alkalies, amount to only 4.08 per cent., a very low figure, and such a clay should and does stand a temperature of 3200 degrees Fahr. without any signs of vitrification or softening. The trouble could not lie with the fusibility of the clay. The glass batch, to be sure, was far too alkaline, and was a dangerous mixture to melt in a clay pot, but we concluded, after certain calculations, that there was no reason why such a clay should not resist longer if the pot were properly constructed and handled.

We next visited the pothouse and took up the question of the manufacture of the pots from beginning to end. Before we had been one hour there the cause of the whole trouble began to dawn on us. The potmaker is usually a skilled laborer, who takes great pride in his trade, and in this instance we found some old-timers at work pounding and pressing the well-pugged and trodden clay into place, and building, inch by inch, the walls of the beautifully symmetrical pots. But, despite the skill, we discovered, in the course of a few days, that the men all complained of being too much hurried; that the clay used in one part of a pot was often wetter than that in another, and that there were certain flaws, due to haste, that were smoothed over and hidden away.

We were told that in summer six months were allowed for drying before the pots went to the furnace for final drying, and yet we also found that all the potmakers knew that this was too short a time for good results.

Now, the difficulty of drying, evenly and perfectly, a mass of wet clay was well understood by the old-timers, who often allowed a whole year for drying under cover in a proper room. By degrees the rush of the times changed the methods and hastened the drying. Men were paid by the piece, and not by the day.

To send a pot to the furnace, or even to the bridge, before the moisture is wholly dried out of it is to send it to its immediate destruction. On the sudden raising of the heat from the normal air temperature to a point above 212 degrees Fahr. incipient cracks are produced and the walls of the pot are ruptured in every direction. Along the edges of these cracks, however small and fine, the molten glass begins to work, and, finding access to the interior of the wall, soon bores its way through.

But besides the artificial moisture in the clay—the water which has been added to make it plastic—there is about 10 per cent. of chemically combined water in the raw clay used. This chemically combined water cannot be dried out by any length of air drying, not even by the hottest sunlight, since it requires a red heat to break up its chemical combination. There is, therefore, about 5 per cent. of water remaining in the most perfectly air-dried pot—if half and half mixture of burnt and raw clay was used—before it goes to the furnace. This combined water can be converted into steam slowly and little by little by a gradual rise of temperature in the kiln, or it can be driven off violently by suddenly introducing the new pot into a kiln already hot. In the first instance, the combined water is converted into steam and escapes, particle by particle, from the contracting clay, causing no rupture and leaving a sound pot, while, in the second instance, a certain amount of water remains in the center of the mass after the outer surfaces have been already rid of their water and have contracted and hardened considerably in consequence. The escape of this caged water, when, in turn, it is converted into steam, takes place through the walls of the hardened shell, causing rupture and leaving the pot cracked and unsound, even before the introduction of the glass.

When such an abused pot is honeycombed and eaten by the glass the quality of the clay is blamed in most cases, though it has been subjected to a treatment which no clay, however good, will stand, and though the ignorance and carelessness of the glass manufacturer are really at the bottom of the trouble. We do not mean to imply that the clay is not often to blame, for there are certain utterly worthless clays on the market,

wholly unfit for the making of glass pots or tanks; but, granting that a good clay is used, we wish to point out a common source of trouble with glass pots, even when the glass is normal and other points carefully considered.

When homogeneous in structure and regular in thickness of wall, when slowly and thoroughly dried and carefully fired, a clay pot becomes, to a certain degree, an elastic body, in which are established—as in a piece of hardened metal—certain coefficients of expansion and contraction which allow of change of temperature without fracture, and without even incipient cracking.

On the other hand, the pot that has been too rapidly dried and ruined by sudden firing, though it expands and contracts with equal facility, does so by the opening and closing of thousands of minute cracks. In short, the properly prepared pot is like a piece of metal in structure, while the hastily dried and fired pot is like a sponge.

There are, of course, many other factors that pertain in the

SOFT MUD VS. AUGER MADE BRICK.

A LETTER FROM OREGON tells of the woes of an amateur brickmaker there. He is trying to introduce auger machine brick, but meets the old stock forms of opposition. He makes very good brick, but the masons, who have been accustomed to laying soft mud brick, are against him. They claim that his brick are not as good as soft mud brick. They are stronger, and it takes a harder blow to break them. Some of his opponents tell him that auger made brick are not used any more. He writes to inquire whether auger made brick are being used in other sections of the country.

I supposed that these objections had been crowded entirely out of the country, but it seems that they are still hanging on at the western extremity. It surely will not be long before they will be pushed off into the Pacific. The auger made brick have made a hard fight against prejudice, custom and the blunders of their friends, but have about gained the position to which they are justly entitled. One of the first objections they met was the difficulty that masons find in cutting them with the trowel. Naturally the mason would object to anything that



A Brick Man's Brick House. See Page 11.

making of sound pots beyond the mere question of drying, such, for instance, as the relative amounts of raw and burnt clay in the mix and the sizing of the "grog." The chemistry of the clay as to composition and the relation of silica to alumina must be carefully considered in connection with the particular glass which is being melted, but we have only dwelt upon the most common cause of defective pots in this short paper, and one which we believe every potmaker can overcome by a little care, since it has nothing to do with the chemical composition of the clay or the glass, and is common to all clays alike.

A glass pot, to be serviceable and to stand the hard test to which it is subjected in the kiln, should be made with as much care and attention as a piece of French porcelain, and when so made is almost as beautiful to look upon.

W. M. CHAUVENET.

made his work harder or that gave him any extra trouble. The first auger machines made laminated brick, that broke in the direction of the laminations when struck with the trowel. This was a serious objection, and the masons were justified in finding fault. Auger machine makers rose to the occasion and have practically overcome the difficulty, and their brick are made without laminations. Some have corrected the error by setting the die quite a distance ahead of the auger, so that the clay will be pushed in bulk, after the style of plunger machines. Sandy clays are not apt to laminate, and those smooth clays that tend to lamination may be improved by the addition of sand. Auger made brick that are free from laminations can be cut in any direction with the trowel the same as soft mud brick, with the difference that they are more dense and require a harder blow to break them. Since they are made of stiffer clay and formed under greater pressure, they have more clay in them, are more dense, heavier and stronger than soft mud brick, will stand rougher handling, and sustain greater pressure in the wall.

D. W. STOOKEY.



Written for the CLAY-WORKER.

THE POTTER'S ART.—No. 2.

BY W. P. JERVIS.



THE CHARM of the potter's wheel is indescribable. Its antiquity is as remote almost as pottery itself. It was known to the Egyptians contemporaneously with or prior to the building of the Pyramids. Mr. Prime claims there are no known specimens nor the evidences of either potting or of any other industrial art more than five thousand years old.

In the alluvial deposits of the Nile pottery has been found at such a depth as to suggest such a remote period as fourteen or fifteen thousand years ago, the computation being arrived at by the known fact that the Nile deposit averages about three and a quarter inches per century. Mr. Prime's contention is that the pieces have all been found near some large monolith, to the site of which canals had been cut below the level of their foundations, and that the pieces found are but the fragments of vessels broken by the workmen. If this is the true aspect of the case, then for more than four-fifths of this time the potter's wheel has held undisputed sway. Homer, in his day, was inspired by the poetry of its motion, as was Longfellow in ours. The earliest form was a disc or circular table of wood, set on a vertical spindle and made to revolve by hand. Later this table was placed lower down on the spindle and made to revolve by a treadle. This allowed the thrower the free use of his hands in forming the ware. To-day the art of throwing is comparatively lost. Until a few years ago it was one of the most remunerative branches of the potter's art, and a workman, ordinarily skilled, could earn \$8 a day. This high rate of wages made him consequential and independent, and he failed to perceive that his employers would hail with joy the advent of a machine that would enable them to dispense with his services. Such a machine is in general use to-day, and not only plates and cups and saucers, but jardinières and even oval bakers can be made with it. It has been the destruction of a most interesting handicraft, which is the more to be regretted as these evidences of craftsmanship are becoming so rare.

Let us watch the thrower a minute. Before him is a horizontal wheel, to which is attached a plaster bat. His attendant



Venetian Potters, 16th Century.

weighs out a portion of clay and hands it to him. This he throws on the bat—hence the word “thrower”—and by the action of the foot or whatever motive power is used, the wheel revolves, and like a creature of life the clay seems to respond to the slightest touch, the very thought of the potter. It assumes every variety of shape. Spreading out and leaving a hollow center, it grows under his deft hands and becomes

what he pleaseth, be it vase, cup or bowl. For tools he relies principally on what nature has furnished him with, supplemented by a few pieces of wood or bone. By a simple change of his hand the clay assumes the shape he desires, and in a less time than it has taken you to read this the operation is finished, the piece is removed by an attendant and another portion of clay is thrown on the wheel.

But, as before intimated, man's ingenuity has at last devised a substitute, and, however much we may regret the loss of a friend so old, utilitarian motives bid us welcome its successor, even though it bears such an unromantic name as “the jolly.” With this machine greater uniformity in size and shape and a larger production are ensured. This jolly is a “vertical revolving spindle, on the top of which is attached a circular iron vessel, varying in shape and size, according to the kind of ware to be made on it. This is set in an iron frame, with the iron vessel, or jigger, as it is called, resting above the top of the workbench. The shaft is so arranged with friction pulleys connected with the motive power as to give a speed varying from 150 to 800 revolutions a minute. In this jigger head is placed the plaster of paris mold. The mold for a cup is not unlike a common red flower pot in shape, except that it is several inches in thickness, the inside of the mold forming the outside of the

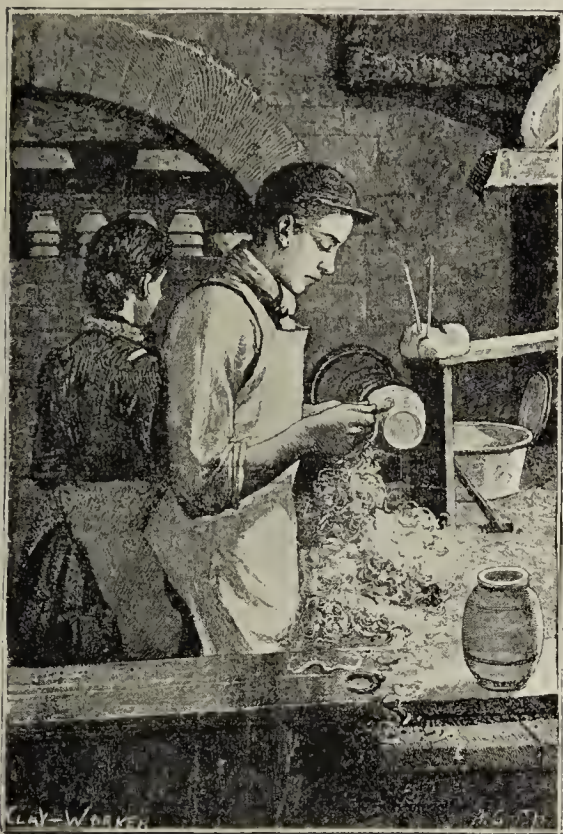


A Modern Thrower.

cup. The lower outside part of the mold is made to fit the jigger head, the rim serving to hold the mold at a proper height. A man operating a jigger requires two helpers, called “batter out” and “mold runner.” The one at his left hand side places a cake of clay about one inch in thickness and about four and a half inches in diameter in the mold. The mold is placed in the revolving jigger head by the operator, who presses the clay firmly with his right hand or with a moist sponge against the inside of the mold. In front of the operator and beyond the jigger heads is an arrangement called the pull down. This is an iron lever, working on a pivot, and carefully balanced, so as to be thrown out of position when not in use. To this lever is bolted a flat iron tool, one edge of which is a perfect profile of the inside of a cup. The lever is then thrown out of position and the mold with the cup in it is handed to the mold runner at his left hand side, who carries it to the drying shelves.”

Let us follow the manufacture of this cup. Whether made on a wheel or jiggered it is taken to the drying house to hasten the evaporation of water from the clay. When dry enough to handle it passes to the turner, who adds the finishing touches to it on his lathe. This is a horizontal spindle, driven by steam power, so arranged as to go in either direction. Formerly the lathe was driven by a woman, “a lathe treader,” but this ignoble employment is now fortunately a thing of the past. To the right of the spindle is attached a wooden chuck shaped to fit the inside of the cup. With a sharp tool the turner pares off a light shaving from the outside, fashions it to the shape required and smooths and rounds the edges. His helper, with a moist, fine

sponge adds a few finishing touches and it is ready to be passed on to the handler. The turning lathe was adapted for use in the manufacture of pottery by Josiah Wedgwood, an independ-



The Turner.

ent invention, although previously used by the Chinese and Japanese.

The handle is made in a mold formed of two parts, with an impression of one-half the handle in each. A roll of clay is placed on one side and the other half of the mold is pressed on it and the whole put away to dry. These and all other pottery molds are made of plaster of paris, which, being very porous, absorb the moisture and cause the clay to shrink, so that when dry it is easily removed. The mark down the middle, caused by the joining of the two parts of the mold, is scraped with a knife and smoothed with a sponge. The handler dips the ends in water or slip to make it adhere firmly and presses it to the side of the cup, which is then placed on a board with others and carried to the green-room to await being placed in the oven. Formerly the bottom of the handle was finished off with a small leaf, which was made in a separate mold, but is now seldom used. Having now advanced the ware to the "green" state, we will before continuing its manufacture turn to articles made by other processes, and, having brought them to the same stage, the latter processes are identical.

Plates and saucers are also made on the jigger, the only difference being that the inside of the cup is finished on it, whilst the opposite is the case with plates and saucers. Pieces such as cover dishes, jugs, etc., and all articles with embossed surfaces are made in a mold, and the process is called pressing, the workman, a hollowware presser. The cover to a dish suggests to us the idea of keeping warm the contents, but I have seen it stated that the cover owes its origin to an entirely different reason. It was the fear of poison that first suggested their use, so that it should not be introduced in the food between the kitchen and the table, the cook was ordered to cover the dishes, and this cover was never removed until the master sat down to eat.

The molds for these hollowware pieces are made in sections, in the case of a teapot as many as twelve being required. A jug requires five sections, three for the body of the jug and two for the handle. Placing the section for making the bottom on a bench, the presser beats out a piece of clay, polishes and smooths it with a knife, and with it lines the mold. Placing it

on a whirler he takes a moist sponge and presses the clay into the mold, and, repeating the operation with the other sections, joins them together and keeps them in position with a leather strap. The joints or seams, where the sections come together, he covers with a roll of clay, which he smooths down even with the body. The inside is then carefully sponged and smoothed with a piece of soft rubber and the mold is put away to dry. The handle is made and fixed on precisely similar to that of a cup. When taken from the mold it is smoothed and polished and is ready to wait its time for firing, in the green-room. This process is also employed for making vases, except those plain shapes that are thrown and turned. Vases of large size, or having narrow necks, are made in separate pieces and joined together by means of slip. But there is another process of molding which the French call *coulage*, and which is known to us as casting. This process is extensively used in France, one reason being that their clays are not so plastic as ours. One of the large Limoges manufacturers have decided to abandon pressing altogether and use only the *coulage* process for their hollowware. The various pieces of the mold being fitted together and properly secured, liquid clay or slip is poured in through a hole in the top. The porous plaster absorbs the water, leaving the clay adhering to the walls or sides of the mold, and when this is of sufficient thickness the workman pours out the remaining slip and puts the mold aside to dry. Further evaporation shrinks the clay and facilitates the removal of the piece from the mold. Those delicate egg-shell cups, so fragile as to suggest their use for nectar or ambrosia only, are rendered possible by this process.

Parian, being a non-plastic body, is made entirely by casting, in the case of figures generally in a number of different molds, the parts being afterwards united with slip.

In the case of very large vases, the difficulty of retaining so large a body in perfect shape is materially assisted by subject-



The Hollow Ware Presser.

ing the paste in the mold to atmospheric pressure by means of an air pump.

Even before the Egyptians used fire to harden their bricks they employed molds for making them. The Greeks at first

molded the handles only, making the body of the vase on the throwing wheel. The Italians did exactly the same until they began to imitate metal vessels, when they used them as molds.



The Modeller.

In Japan clay molds were used exclusively until a few years ago.

The ware has now advanced to the green state, but to effect this two important personages have had an active share, the modeler and the moldmaker. Both are equally important factors, though one is entirely artistic, the other craftsmanship. This may be an invidious distinction, for Carlisle says that even a nail can be driven artistically.

The modeler prepares a block of clay of about the size of the article he wishes to produce, and the shape and ornamentation are effected exactly as a sculptor fashions a block of marble, with this material advantage, that the clay modeler can add to his block to produce reliefs. Our illustration shows the modeling room at the Copeland (Spode) factory, at Stoke-upon-Trent. The artist at work on the vase is Mr. John Abraham; behind him is Mr. Arthur Birks, a well known pottery modeler, while the art director of the factory, the late Mr. R. F. Abraham, is watching with interest his son's progress.

From the model so prepared a plaster cast is made in the sections necessary, and from this the working molds are made.

Written for the CLAY-WORKER.

MAKING BRICK BY DRY CLAY PROCESS.



THE ART OF DRYING BRICK is the first and most difficult part in the process of making it a durable building material, especially so if the brick are dried in the kiln. The most successful way to dry brick is the system used by the various hydraulic pressed brick companies, using the heat from a cooling kiln to dry the green kiln by artificial draft, but the majority of pressed brick factories are so constructed that drying has to be done by direct firing or by tunnel driers. This article is intended for the benefit of the brickmakers who dry by direct firing. After the kiln has been filled and casings all laid and plastered tight, examine all the chimneys or stacks, if they have not been in constant use, and, if found to be damp, build a good fire in each one, if possible, to create as strong

draft as can be had. Then build a moderate wood fire in each furnace, until they become warm. The fires should be kept up steady for six or eight hours and then be allowed to burn down. Each successive firing should burn down low enough that it will start the next one. This mode of firing should be continued for five or six days before the doors of furnace are to be closed and regular fires kept up. Firing should be increased from now on until the trials of the kiln show that the limit has been reached. Care should always be taken with the trials, if a thermometer be used, for, unless the burner is thoroughly familiar with his wares, he is liable to make a mistake. I have always used a solid iron rod for taking the moisture in water-smoking. It should be about twelve feet long, and allowing forty-five seconds as the time in the kiln. On removing it, if it be covered with a thin coating of moisture, the drying is proceeding fast enough. Twelve days is the average length of time for drying finely screened clays, as they give up the moisture slower than coarsely screened clay. For a kiln set thirty-two brick high fourteen days is a better length of time than any less. It is not advisable to dry faster than two courses a day after the first twenty-four hours. If coal is used in burning, the bottom of the kiln should be well heated with water-smoking fires before coal fires are started. Have the bottom hot enough so that when you try the kiln with the rod it will be too warm to hold in the bare hand.

—Burning with Coal.—

The problem to solve in burning high grade pressed brick with coal is to avoid stained ends and flashed edges. Stained ends are caused by the blaze from the furnaces. Flashed edges are caused in various ways, principally by heating the kiln too fast before the clay gives up the chemical moisture, causing the outer surfaces of the brick to shrink away from each other and allowing smoke and soot stains to lodge there; then, when the brick are perfectly dry and the edges come together again, the sediment is held between the brick until burned out in the latter part of burning. Another way to cause flashed edges is by alternately heating and cooling the kiln during the time of settling. In such manner is produced that delicate shade of black around the face of the brick that causes the manager to offer congratulations to the burner that it was not worse. The brighter red the clays burn the more the stains will show. The best way to burn with coal of medium or high carbon properties is by green firing. In that way the burner has a better chance to burn up all the smoke and gases before they can enter the ware. This style of firing takes one extra man to each turn, and will cost more for fuel, but the results attained more than compensate the company, besides costing less for grate bars and repairs. Another way in use with some firms is the double furnace system, constructed after the following manner:

Build two furnaces, with grate surface about twenty inches wide to three or four feet long, being twenty inches high from grate bars. Leave a recess at bottom of door three inches wide and as long as the door for an air space. Have the furnaces both open into the same bag space, and by firing each one alternately, fifteen to twenty minutes apart, after the furnaces become hot, the smoke is nearly all consumed before entering the kiln. This system is better adapted for white clays than red.

Plenty of time and patience should be the motto of every brick burner. The kilns should always be heated up even all through, and do not use all of the draft to start with. From the starting of coal fires eighty hours should be the lowest limit to get shrinkage on the ware, and for a kiln set thirty brick high eighty-four hours should be allowed for nine inches of settle. Measurements should be taken every two hours after the ware has started to settle. Be very particular to get every measure correct. It is one of the greatest fuel savers in the brick business. A pound more of coal in a furnace than is needed is nothing but waste. Keep all cracks plastered tight, and

watch the furnaces closely, allowing no air to get back of the fires and cool the kiln at that point.

For measuring I use a self-adjusting wire, stretched the full length of the kiln, about three feet above the crown and perpendicular over the measuring holes. On the rods place two collars, with thumb screws in them. After the kiln is red on the bottom, set the rod on the measuring tile and fasten the lower collar so that it will clear the wire. Then, with the other, the amount of settle can be taken.

W. E. VORHIES.

Written for the CLAY-WORKER.

IN DEUTSCHLAND. No. 15.

HAVING in the preceding papers touched upon the manufacture of the lower classes of clay ware, it would seem fit to consider the production of the higher classes, embodying the highest skill of the clayworker—white ware and porcelain. But however minutely the mechanical operations might be described, which, by the way, correspond with the methods in use in the other branches of pottery, a knowledge of these operations would not help to the understanding of the principles underlying the manufacture of the high grade wares. There are two essential characteristics which govern the production of white ware and porcelain. First, the building up of a body having the required physical and chemical properties, with a suitable glaze; second, the artistic treatment of the wares. The composition of these bodies, for whatever purpose used—pottery, tiles, etc.—lies entirely in the hands of the manufacturer, for the bodies are altogether artificial compounds, whose properties may be varied at will by changing the ingredients. This is the radical distinction between the higher and lower classes of ceramic products. The four ingredients entering into the composition of white ware, etc., are: Feldspar or Cornish stone, kaolin, ball clay, and flint. Kaolin, ball clay and flint constitute the main body, to which feldspar or Cornish stone is added as a flux. The less spar is introduced the more stony does the compound become, and, likewise, if the percentage of feldspar is raised the body becomes more glass-like. Kaolin produces whiteness of color and furnishes some of the plasticity necessary for the working of the mass, but as it in itself cannot impart sufficient plasticity, ball clay, a secondary plastic kaolin, is added to remedy this defect. But the more of the latter enters into the composition the greater is the tendency of the body to assume a yellowish tint. Flint, being a non-plastic substance, forms the skeleton of the whole, so to speak, and reduces the shrinkage of the ware in the drying process.

From what has been said it is evident that the composition of the body must in every case be suited to the requirements of a particular kind of ware, be it white ware, soft or hard porcelain. Taking, for instance, white ware, the lowest grade of this section, the main requirement for this body is toughness, which is obtained by increasing the clay substance at the expense of the fluxes, the glaze being a soft boro-silicate. Thus a large variety of compositions may be obtained by making them more or less glass-like, and also by introducing neutral ingredients, like in bone china. The German manufacturers seem to have complete control over their body compositions, which is evident from the readiness with which they reproduce foreign wares, for instance, like the Japanese ware. This is explained by the fact that they have called science to their aid, and, by means of the rational analysis, obtain the key to the seemingly most mysterious composition.

As to the artistic merits of German ceramic products little need be said, for the fame of establishments like the Royal Porcelain Manufactory, of Berlin, that of Meissen, Nymphenburg, etc., has spread all over the globe.

—Characteristic Points of German Brick Works.—

No conclusions can be drawn as to the relative standing of

the industries of two countries unless we compare them in an impartial manner. Let us note the points in which a typical German brick plant differs from an American establishment. First, we are most agreeably surprised at the appearance in which the orderly spirit of the Germans shows itself in the endeavor to beautify even such a prosaic institution as a brickyard. Instead of being an eyesore, the brick works are composed of clean looking buildings, with some pretensions as regards architecture, with brick as a building material. Not infrequently shade trees and even lawns surround the establishment. In place of black smoke belching forth we find a white or gray cap of vapor clustering around the top of the tall, well-built stacks. Throughout the entire plant everything is built in a most substantial manner—built to stay.

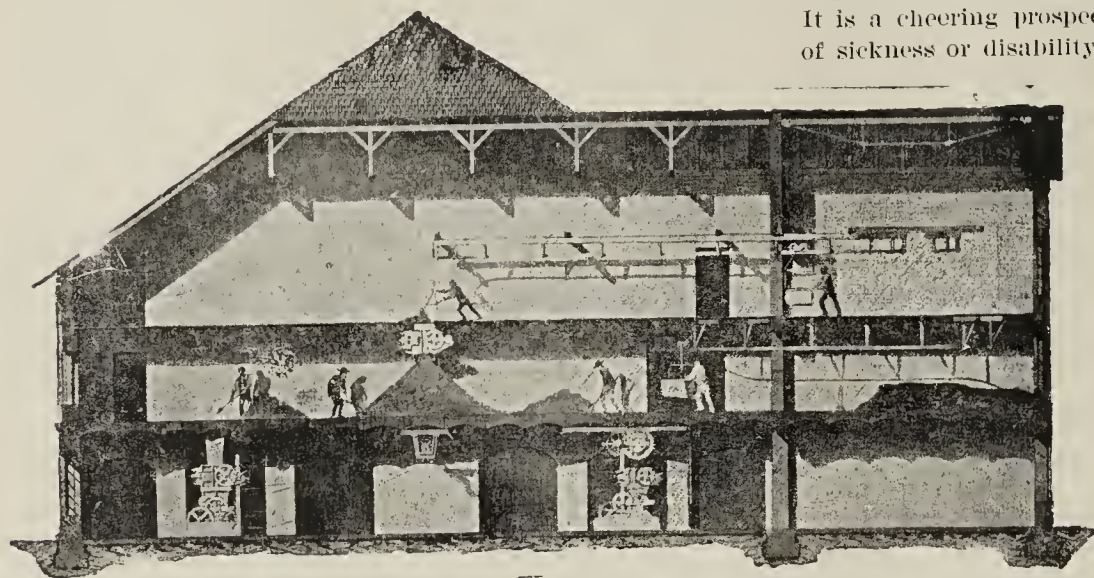
In regard to mechanical equipment German economy is



Jewish Temple, Berlin.

shown by the use of compound and condensing engines. The element of strength is predominating in all the machinery, a feature which sometimes seems to be carried to excess. The auger machines have reached a high point of excellence, but we fail to see the many smaller labor-saving devices common to American yards. For instance, the cutting tables, though they do good work, when compared with ours seem like toys as far as capacity is concerned. Automatic machines are unknown. The elevating devices, both for clay and molded ware, are in most cases built with more regard to durability than to economy in labor. Soft mud machines and dry presses are almost unknown. All the machinery, however, is kept in a scrupulously clean condition and in excellent repair. Great pains are taken to reduce the danger of accidents to the min-

inum. Guard rails are put up around all revolving shafts, pulleys and cog wheels, and strict regulations in regard to the operation of machinery are enforced. In regard to the drying arrangements, the great object seems to be the saving of fuel, and this is often carried to the extreme, for not infrequently the cost of drying brick on the regulation floors above the kiln, owing to the cost of extra labor, is higher than it would be in an American tunnel drier, with its attendant expense for fuel.



Arrangement of Clay Preparing Machinery in a German Brick Works.

But the department in which the Germans excel par excellence is burning. Often as it has been said, it must be repeated that they are masters in building and handling the continuous kiln. That face brick, and even glazed wares, are burnt successfully in these kilns is a fact which cannot be contradicted. Of late years important improvements in German kiln construction have been made which retain the benefits of the continuous system, but aim to entirely remove the objectionable feature—the direct contact of the fuel with the goods to be burned. This is accomplished by providing various kinds of double fire walls. There is no doubt that the continuous principle is bound to be applied to our modes of burning, and, while the German continuous kiln may not be exactly what is wanted, with some modifications in regard to the size of the chambers and doors and to the firing arrangements it is destined to be the kiln of the future. Millions of tons of coal are being uselessly wasted in the American kilns. Fuel which nature has accumulated in millenniums of growth is being burnt up as if the supply were inexhaustible. But the day is drawing near when our fossil fuel must be economized by all means.

The management of German clayworking establishments is more complicated than the American methods. Elaborate systems of accounting are in vogue, which deal with the most minute details of manufacture, and, in order to do this, officials are employed which are totally unknown in American establishments. There are directors, assistant directors, inspectors and foremen, whose work in most American factories is done by one or two men, though perhaps not quite so exact.

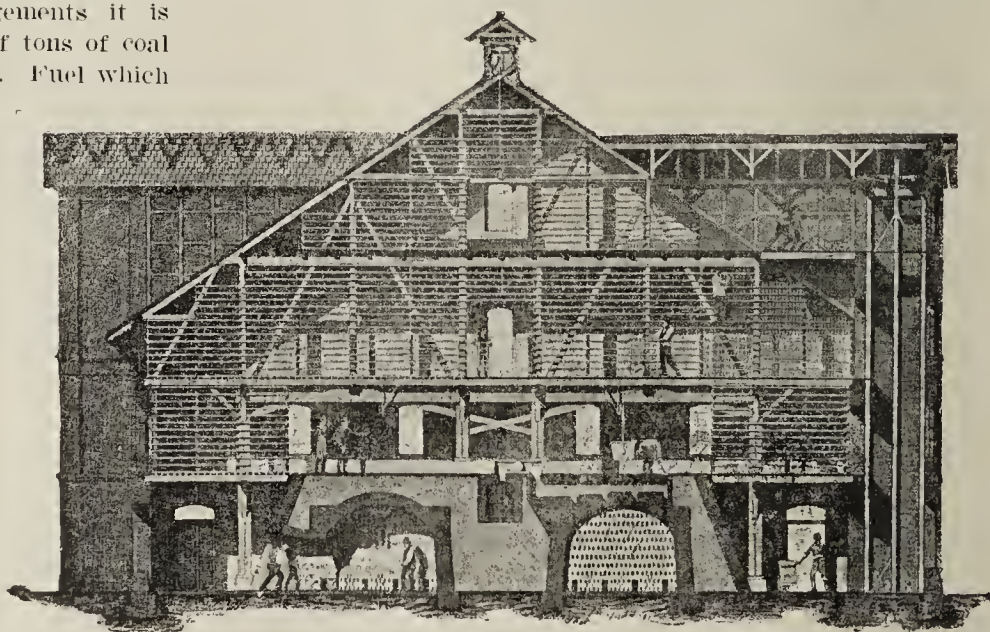
Much has been said and written about the condition of the European working classes, and the impression exists that extreme destitution prevails among them. As far as the German clayworking industries are concerned, the writer believes that the condition of the workmen cannot be termed destitute. That the people are often poor, very poor, is true, but sufficient food, coarse though it be, seemed never to be lacking. It is also true that articles which the American workingman regards as necessities are totally unknown to the German worker. The

writer does not mean to imply that German conditions are ideal, or even proper; on the contrary, it would be sad, indeed, if our standard of living would have to be lowered to that of the German laborer. But credit must be given where it is due, and it must be acknowledged that, considering the circumstances, the governing powers of Germany have done much to raise the status of the laboring classes during the last ten or twenty years. During that time compulsory government insurance and a pension system for the workmen have been established. It is a cheering prospect for the laborer to know that in case of sickness or disability he has a right to apply to the govern-

ment insurance fund and that he secures the benefit of a small pension after having reached a certain age.

One feature obnoxious to the eyes of an American is the employment of women on brickyards, and it is a sad sight to see them drudging along with the heavy work incident to the operation of a brick works. The wages of German brickyard hands are, of course, very low as compared with rates prevalent in the United States. A setter is paid 62 cents per day of ten hours, a wheeler 55 cents, while women receive from 30 to 40 cents.

First of all nations, the Germans have called science to their aid in industrial processes, and this is the true cause why their fire brick, white ware and porcelain industries have reached such a high degree of perfection and why their methods are free from guesswork. The world is indebted to Germany for her researches in the region of ceramics, investigations worked out in the painstaking, accurate manner peculiar to the nation. With pride may the Germans point to names like Seger, Hoffmann, Aron, Tuerrschmidt, Zwick and others, men who have devoted their lives to the study of ceramics and who will ever be associated with the progress of the art. Most prominent of all, the name of Seger inspires every follower of the clay-working art of whatever branch, the man whose untiring, unselfish labors have shed a flood of light upon hitherto dark regions, and of whom the writer has heard the associates of



Dryer and Kiln of the Average German Brick Works.

the late master speak with the greatest love and reverence. It will be time well spent to consider a few of the subjects investigated by that remarkable man with such lucidity and force. One of the subjects he cleared up is the working of the continuous kiln, the theory and practice of its principle. He thus enabled many manufacturers to burn brick without the discolor-

orations attending the operating of the first kilns. Not less important is his work on the application of the pyrometric cones, his examinations of foreign white ware and porcelain bodies and their reproduction with the aid of the rational analysis. The latter kind of investigation proved the origin of the Seger porcelain, famous for its decorative qualities. Of equal value are Seger's researches upon the principle of gas firing, the substitution of alkali for lead glazes, the production of a brilliant red copper glaze color and a large number of other subjects. Germany and the world suffered a great loss with his death, which occurred in the prime of his manhood. We cannot undertake to even enumerate the subjects covered by the other investigators.

The scientific and practical experiences of the clayworking industries of Germany are kept in touch by several high-class journals, of which we will mention only the *Thonindustrie Zeitung*, the *Toepfer und Ziegler Zeitung* and the *Sprechsaal*. Hardly less important is the work done by the different associations of clayworkers, the greatest of which has nearly six hundred active members, who keep up a most pleasing spirit of good fellowship by meeting twice a year, once in Berlin, at the Annual Convention, and again during the summer, on an excursion through one of Germany's picturesque regions. The spirit of the German craftsmen may perhaps be better understood by quoting from the constitution of a German clayworkers' association, according to which the object of the society is "to unite for attaining healthy business conditions by means of a reasonable regulation of production and of prices by local organizations; to unite for mutual fire and accident insurance, for securing lower rates for coal and other materials, and for freight, for advice upon questions of law, and, lastly, for maintaining the interests of the clay industry in all its branches."

Modern brick architecture, though not so highly developed as in the United States, is extending rapidly, owing principally to the efforts of the North German architects and front brick manufacturers, and the odious cement and plaster facades are being replaced by tasteful brick fronts. A fair example of German brick work is the Jewish house of worship, shown by the accompanying engraving.

Another extensive use of brick has been opened by the example of the United States, namely, the paving of streets with brick. Though the use of paving brick in Germany is very old, it has been restricted to a few districts.

The German clay industries deserve our respect, for they

opment at which we find it, must excite our admiration. On the other hand, a comparison drawn between the American and German industries must also reveal to us the high development of our mechanical appliances and the perfection of our building materials, brick and terra cotta, with which it is possible to create the beautiful homes and buildings shown by every city of our land.

These notes are not intended to give a fair representation of the German industry, for to do justice to its magnitude would require the expenditure of considerable time and ability, both of which the writer was lacking. The observations were taken with a view to collecting points which might interest the readers of the *Clay-Worker*, and it never was the intention of the correspondent to attempt a treatise of the subject of German ceramics.

A visit to Europe, while it reveals to the traveler new experiences and enables him to absorb much that is beautiful, also—unless he is one of the cosmopolitan travelers so aptly drawn by Mark Twain, who are driven by ennui to the old world—awakens him to the consciousness that he is living in a land blessed above all countries with everything the heart of man cherishes—our beloved Republic.

THE VILLAGE BRICKYARD—AMONG CLINKERS.

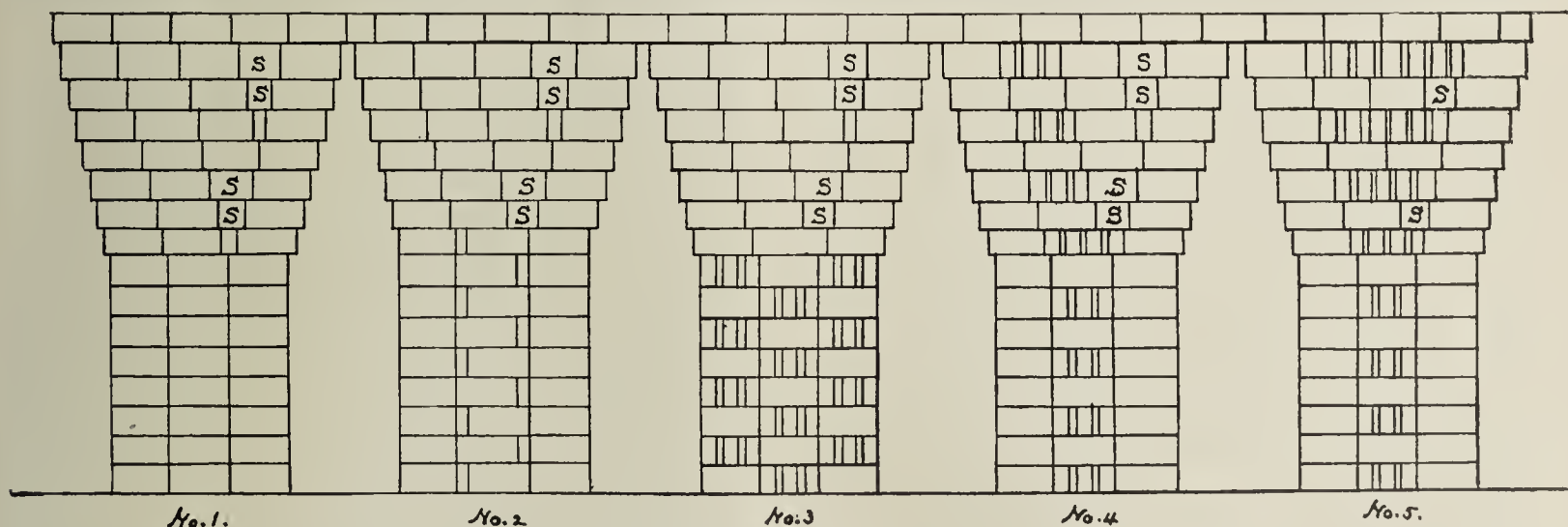
HEREWITH I hand you a sketch showing how it affects a brickmaker to cogitate with a brick in his hat—not the kind that, at first thought, my readers will recognize; on the contrary, this is only a business brick, made out of a bottle, to be sure; but the bottle now contains only nut-gall and vinegar straight.

Father Crary has told us a few hundred times that brick should be set skintle and open in the bottom of the kiln; then we would always have first quality arch brick. Now, the truth is, I never saw a kiln so set, and I am so dumb I am unable to understand how he sets a kiln bottom all skintle and has every arch keep its place with a clay that melts easily.

Consequently, about a year ago, it was concluded to study the question from another point of view. The sketch shows the end of an arch or bench from the kiln bottom up to the top of the same, the brick being set as shown, except all courses marked "S" are set skintle throughout the kiln.

—Arch. No. 1.—

This bench is set as usual for Dutch kilns in the vicinity of



The Village Brickmakers Experiments in Setting Brick.

labor under difficulties not experienced by the American manufacturer. Under a government not noted for its liberality, struggling with narrow, restricting laws which impede the transaction of business at every step, loaded with heavy taxes, dealing with strong competition and being aware that the outbreak of an European war will destroy the fruits of many years of labor, the German clay industry, at the high stage of devel-

Philadelphia, each brick being always set over the space between two others, which has the effect of confining the smoke and heat to the arch, retarding the draft and requiring great vigilance to prevent melting the whole mass to a slag.

—Arch. No. 2.—

It was finally suggested by one of the kiln hands that our brick melted down so easily because our fire holes were too wide.

and we accordingly encroached on the holes two inches by running a brick lengthwise of the arch in our middle brick, as shown in this plan. It is hardly worth while to add that this operated to make our bench stronger and more solid, but at the same time it made it much more difficult to spread the heat out of the arch, and we just "stuck" nearly every kiln.

After buying this lot of experience, it was concluded to still set on this plan, but omit the cross brick. This gave us an open bottom, but it also gave us wedge-shaped middle brick, because two inches on the end of each brick had no support.

—Arch No. 3.—

About this time an Englishman came to our town from New York, and he laughed at our antiquated ways of doing business, and set in to give us a few wrinkles. Among other things, he set his bench three on three, as shown in this sketch, and he pretty soon found that he was away from home when handling our clay, and that the brick company thereafter only needed his assistance to help load carts. The fact is, he worked by somebody's book, and while a book is an excellent thing to have in the yard, it has to be used with judgment. For instance, it may suggest points that a practical man can investigate, or it may be used to light a fire, but a book never yet taught a man how to rattle his brains in an empty skull.

—Arch No. 4.—

This plan was evolved by the writer getting his feet on the

Written for the CLAY-WORKER.

BRICKMAKING FOR PROFIT.

"Praise me not too much,
Nor blame me, for thou speakest to the Greeks,
Who know me."
—Bryant-Homer's Iliad.



IN FAR DISTANT EGYPT, some few years back, was excavated the mummy of that hard-hearted old brickmaker, Rameses II, better known to us as Pharaoh. It was he who commanded his officers to give the children of Israel no more brick material, saying: "Ye shall no more give the people straw to make brick, as heretofore; let them go and gather straw for themselves."

Could this stingy old reprobate soak out his mummified carcass, introduce life into his old shell once more and visit one of our modern, up-to-date American brickyards he would discover that during the period since he stopped making brick, about 3,500 years ago, the world has made mighty strides of progress in clayworking. Perhaps we could get him to accompany us to Connecticut and visit the town of Berlin, where upwards of seventy-five millions of brick are made per annum.

The first sight which attracts our attention as we approach the brickyards is the tall chimney connected with the electric



EXECUTIVE FORCE C. P. MERWIN BRICK WORKS—E. S. Morse, Gen'l Manager; C. Clifford Merwin, Supt.; H. D. Payne, Chief Clerk.

mantel shelf and stretching his body in a horizontal position in the office chair, beside the refuse knots that were too large to go in the kiln doors—just a straight thunk. And how simple it is! Set the face of both arches just as usual; the air from the arch passes lengthwise between every two brick into the middle brick, and there it strikes brick, set three on three, all the way up to the platen—a perfect chimney; the strongest bench that can be made; no wedge-shaped brick; no complicated plan of setting; no changes to require special skill.

It will be seen my New York Englishman's blunder is simply combined in part with the old-time Philadelphia plan, and the combination produces results. Some of our political friends believe in combinations that produce results, and, I am sorry to say, they are very active in the use thereof; but this kiln combination is another matter; it is a matter of dollars in every brickmaker's pocket; a place, by the way, that has recently been represented this way: \$-\$\$-\$\$-\$\$-\$.

—Arch No. 5.—

This is the same principle as in No. 4, carried up the forward part of the arch. It has not been tried in our kilns, but it looks reasonably sure to work, and will spread the heat more regularly among the arch brick, and, it is believed, will make the overhang of the arch carry itself with proper strength.

THE VILLAGE BRICKMAKER.

power station of the N. Y., N. H. & H. R. R., which, by the way, is the largest plant of its kind in the world, and furnishes electric power to operate a third-rail system some thirty miles in length. It is a handsome mass of burned clay, containing, we are told, 1,200,000 hard brick. As we are admiring the structure a native approaches, and we inquire who could have made those fine brick, models in color, size and texture, and, without offering a reply, he points eastward toward the rising sun. Looking in the direction indicated, we discover a little village of cottages, numerous smoke stacks, a huge windmill, innumerable drying racks, a neat little office building and brick sheds extending as far as we can see, while plainly painted on the end of the shed nearest us we recognize the well-known name of MERWIN.

Reaching the office, we are greeted by the officials of the C. P. Merwin Company—Mr. R. Clifford Merwin, who succeeds his father in the business; Mr. E. S. Morse, the efficient General Manager, and Mr. H. D. Payne, the genial head bookkeeper. We immediately "button-hole" Brother Morse for some information regarding his plant, which he readily agrees to, and, after cautioning us in his "bashful" way not to "spread it on too thick," gives us the following facts:

In September, 1882, the late C. P. Merwin, who had previously been engaged in the wholesale grocery business, bought

of Mr. Fred Stiles one-half interest in this yard, which then consisted principally of one hundred acres of fine brick clay and was operated by horse-power. This partnership existed for about two years, or until January, 1884, when Mr. Merwin bought out Mr. Stiles's interests, and immediately upon assuming entire control remodeled the whole plant, introducing steam-power and five Wiles brick machines. These improvements increased the annual capacity of the yard to seven million brick, but Mr. Merwin was not satisfied yet. He looked into the future and saw the great field which was to be created for his bricks, and he was resolved to be prepared. In 1886 the pallet system was introduced. In 1887 a Quaker machine was set up. In 1890 three New Haven machines, each with a daily capacity of 44,000, were started, and the following year a new Brown steam engine of 200-horse-power was connected with the machinery. The pallet system was improved and enlarged, new sheds were built, and every new idea or method in brickmaking or burning which would tend to increase the efficiency of the plant was adopted, until to-day, with a yearly output of 15,000,000 brick, exclusive of hollow brick, with every modern appliance and convenience, Merwin's brickyard is known throughout the country as a model of perfection, and Merwin's brick are known and used all through the New England and Eastern States.

Having given us this retrospective description of the yard's growth, Mr. Morse invited us to inspect the works. Systematic in every move, the Superintendent shows us as a starter the first scene in the act of brickmaking—the clay bank. The concern now owns 160 acres of fine clay, and the pit is kept dry by a six-inch rotary pump and a huge Aermoter windmill.



Chambers Hollow Brick Machine in operation at Merwin's Brick Works.

Cart loads of clay are constantly passing us on their way to the brick machines, and we turn our steps in the same direction. Gangs of men are working like bees around every machine, each of which is turning out an average of eighty brick per

minute, while over there is a Chambers brick machine which is grinding out one hundred hollow brick per minute. What would your brickmakers say, Pharaoh, if they could see this machine work? It is, by the way, the first hollow brick ma-



"CHIEF," the Pride of the Yard.

chine to be operated successfully in southern New England. Chambers Bros., of Philadelphia, the makers of this machine, put in a whole outfit, consisting of a clay disintegrator, pug mill and brick machine, also automatic edger and pallet carrier. This pallet carrier is an improved attachment, which enables the owners to use the ordinary soft mud pallets and their ordinary trucks in handling the stiff tempered end cut brick made in this machine. While the Chambers machine was put into the Merwin yard for the express purpose of making hollow brick, nevertheless they have already made a number of solid brick, which they use to set the arches of their kilns. We ought to have a picture of this machine in operation, so limber up your camera, Brother Curtiss, and take a pop at it.

We wonder if Mr. Morse knows what Chambers Bros. think of his yard. Mr. J. H. Chambers says this regarding it: "We think the C. P. Merwin brickyard is the best arranged soft mud brick plant we have ever seen, and, leaving out the question of color, which is due to their fine clay, we do not think we ever saw a better soft mud brick than they make."

From the machines we pass into drying yards and inspect the pallet racks, which are loaded with millions of newly-made brick. All the racks are provided with the Goldrick patent shutter, which practically covers the whole yard, keeping it dry in stormy weather and protecting the workmen as well as the brick from the rain.

Reaching the sheds where the kilns are we witness a scene of great activity. Here a gang of men are constructing a kiln preparatory to firing, and there another gang are pulling down a huge pile of red beauties, loading them into freight cars, to be shipped, perhaps, a hundred miles away. And over yonder, where those eyes of fire are blinking at us, is another kiln undergoing the burning operation, and the temperature in the vicinity of this fiery mass of clay strongly reminds one of the realms of Pluto. Ever and anon Brother Morse picks up a pair of his "beauties," and, rapping them together till they ring like brazen bells, accompanies the music with a recital of the virtues of his wares.

Although these brick sheds are large ones, capable of storing some six million brick, the process of loading for shipment is made an easy matter by the use of two spur tracks from the main line of the N. Y., N. H. & H. R. R., which extend, one on either side, through all the sheds.

The Merwin plant is provided with a very complete water

supply system of its own. A huge tank, elevated fifty feet, is kept constantly filled, by a Knowles duplex pump, with six thousand gallons of water, obtained from artesian wells, and pipes carry the water as required to the office, boarding houses, sheds, etc. There are numerous stand pipes throughout the works, on to which a line of hose is kept constantly coupled, ready for instant use in case of fire.

About 150 men are employed throughout the season, and fourteen horses are required to haul brick, clay, etc. Among the latter we must not omit the mention of "Chief," the pride of the yard, who is nineteen years old and has been working in this yard for fourteen consecutive years, without a single visit from a veterinarian.

And now just a word about the enterprising men who manage this concern. But hold; shall we not first say what a woman has done to further the art of brickmaking and to place Merwin's brick at the top, the high standard of excellence? At the death of her lamented husband Mrs. Merwin took up the reins where he had dropped them, and, with the aid of Mr. Morse, she has greatly increased the concern's business. Those who attended the Atlanta Convention of the N. B. M. A. will remember hearing of her there, when she was elected an hon-

ture, and although he is nominally the bookkeeper, he is acquainted with the yard from A to Z.

Come, Pharaoh, you have seen enough to keep you green with envy for centuries to come, so hie you back to your mummy home among the tombs of Egypt. R. N. BUELL.

Written for the CLAY-WORKER.

MAKING BRICK FOR GLORY.



THE BRICK BUSINESS, like many others, is coming down to more work and less profits. Every year the National Brick Manufacturers' Association meets and the brickmakers spend a week in trying to help each other by giving in their experience and telling their brother craftsmen how to make brick cheaper. Well, we have learned how to make them cheaper than we did years ago, but, while we have been smart enough to make them cheaper, we have been slow enough to let the trade drag the price down lower accordingly. If not this, then our brother brickmakers are running out brick at the rate of 50,000 per day by their new auger machines,



General View of C. P. Merwin's Brick Works.

orary member of the Association. Mrs. Merwin resides in a handsome residence in New Britain, Conn., with her three sons, Clifford, Charles and Stewart, upon whom she bestows every advantage of wealth and education.

R. Clifford Merwin, the eldest son, who has lately taken hold of the brick business, is a graduate of Sheffield Scientific School, of Yale University, and well known among college men as an athlete, holding the Yale record for the high jump, 6 feet 2¼ inches. Aside from his athletic prowess, he is a gentlemanly, good-natured fellow, with lots of common sense, and will undoubtedly be heard from in the future.

Mr. E. S. Morse entered the employ of Mr. Merwin in April, 1884, as bookkeeper. Being a shrewd, observing man, he quickly acquired a thorough knowledge of the yard and a clear conception of the art of brickmaking. So well was Mr. Merwin suited with his bookkeeper that he advanced him the following year, by one jump, to the position of Superintendent, which he held till the death of Mr. Merwin, when he assumed entire control of manufacture. Mr. Morse is a member of the N. B. M. A., always attends the Conventions, and, furthermore, always takes his wife along. He is a jolly good fellow, and what he does, whether in the brickyard or out of it, he does well.

Mr. H. D. Payne associated himself with the concern in 1888, and proved himself so efficient that he soon became a fix-

and they think they must keep on running for the fun of it, so they offer their brick 50 cents per thousand lower. This is very easy to do; but try raising the price 25 cents and see how easy (?) it is. Thus the price falls until it is down to such a figure that you are not making any more money out of the 50,000 than you were out of a 25,000 capacity. Then, I say, if the brickmakers could set a price and hold it, they could make less brick and more money, unless they could find sale for more brick at their prices. When they get so many brick on hand that they must cut the price, then is the time to stop and take a few weeks' recreation instead of working hard and giving an ungrateful people the advantage of your work. No; better rest awhile than work for nothing and ruin your price. In nearly every locality you will find brick plentiful, unless clay is very scarce. Well, if a yard starts up in a good locality and makes a good brick, and they find ready sale for their output at a good price, it will not be long till they have opposition. Then the tug of war begins. Times begin to get dull; demand for brick lessens. Do the brickmakers stop? No; they keep right on, and they must sell their brick. So brick are put on the market at 50 cents per thousand less. This does not create a demand. They drop again, and so it goes. You cannot create a demand for brick by putting the price down; so it would be better for us to make less brick and more money.

A great many people think there is a fortune in brickmaking, because the material costs very little, except the digging, and they have an idea that any one can make and burn good brick if they can once get a machine started that will turn out the brick. I have seen several yards started just this way. They would get started up; things wouldn't go like they had planned for; they would go to see the practical brickmaker, to borrow his valuable and hard-earned knowledge of the business, without offering any compensation whatever. They will not have a practical brickmaker because he charges too much per month; yet they lose enough by bad burns and bad management every month to pay a good man, and he would save them enough each month to pay his wages. I have seen several yards run this way for a year or so, then go into the receiver's hands. The brick business is like any other in that respect; you must have a practical brickmaker to see that the work is done right and to know when it is done right. Then, when you do this, know what your brick are costing, as near as you can, and fix a price on them that will justify you in running the business. When you cannot get this price, shut down. Better lay idle awhile than sell brick at cost and wear out your machinery for nothing. If your neighbor wants to work for nothing, let him go ahead. He will live to learn, and may learn a great deal in a year if he can live at it that long. You see

Written for the CLAY-WORKER.

THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Third Paper.

BY E. G. DURANT.



WE HAVE NOW reached a point where we may take up the matter embraced in our second proposition, which treats of the artistic features that may be introduced into hollow building blocks to insure the beauty and variety we claim for them as against brick.

The methods of ornamentation adopted are three:

First—Of form, as molded blocks.

Second—Of figure or design impressed. (The accompanying cut (Fig. 13) illustrates both the molded form and figure.)

Third—Of color or mottle, which may be confined to the background of the figure, if desired, to produce a relief effect.

It is not our purpose to make invidious or boastful comparisons, to stir up your many brickmaking readers; but as brick, in the minds of the many, will be deemed our principal competitor, and brick stand broadly as representing clay building ma-



Brick Sheds and Siding, Merwin's Brick Works.

advertised everywhere brick plants for sale at one-half what they cost, and so on. What's the matter? They sold brick at cost, in many cases, to freeze some smaller yards out, and froze to death in the struggle. Too many officers very often cause large yards to fail. The expense is too great for the profit. Three-fourths of the yards that go under are the large concerns. Too much capital invested for the amount of business and too many officers for the amount of work. H. L. JACOBS.

TIME'S COLOR EFFECTS.

"Pa, is that boy crying?"

"He is, my child."

"Why, pa?"

"He wants a plant that bears gold dollars. He cannot have it, therefore he is crying."

"Is he foolish, pa?"

"Yes, child, very foolish."

Second Little Boy (twenty years later)—"What a long face that man has, pa!"

"Yes, a very long face."

"And gray hair, pa. He is not old; why is his hair so gray and his face so long?"

"Long years ago, when a chit like you, he teased his pa for a plant that would bear gold dollars. When he grew up his father bought him such a plant—a brick plant. The plant, my child, and the gold dollars have turned his hair gray and made his face long."

"I don't want a gold dollar plant when I grow up, does I, pa?"

PETER PILKIN.

terial, it is but natural that we make them our standard for comparison. Probably 90 per cent. of those who build of other material than wood employ brick, and wisely so, until the advent of blocks.

As closely as possible we will confine ourselves to facts.

—We Gave Facts—

In our comparisons of strength, weight, etc., but when it comes to the treatment of the artistic features of blocks, as compared with brick, we shall need to express our opinions. Your readers will no doubt constitute themselves umpires, and call us to account as they shall see fit.

We suppose it will be admitted that the ability to make our block represent a face the size of itself or of any other lesser size by the design we impress upon it will give them an advantage over brick when it comes to the consideration of them from an artistic standpoint. The designs are thus relieved of the conventionality or uniformity which, to a large degree, must characterize brick construction. For this reason, if for no other, hollow blocks may claim and hold a place between brick and hand-made terra cotta, when variety and beauty are taken into the account. Stone, in its artistic forms, aside from the massive and enduring features which it represents to most minds, may be considered as occupying the same field as terra cotta; the finest designs of the one may be duplicated by the other, terra cotta having the advantage of reducing cost for a given effect,

and of variety in color and of being even more sure of retaining its beauty. The finest design in stone carving may be reproduced in terra cotta, with the advantage of being reproduced hundreds of times by comparatively unskilled labor when the artist has once produced the mold, while stone, in its duplication of design, requires the same high grade of labor, of time and skill in the last duplication as in the first production; hence

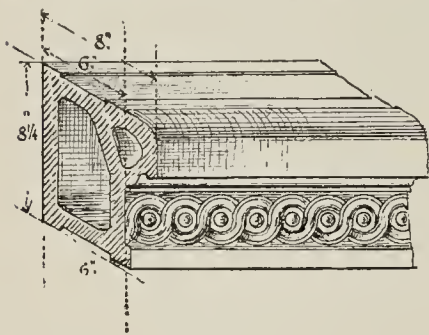


Figure 13.

the ability to produce at comparatively low cost where duplication is required, which is largely the case. Yet, notwithstanding, on page 237 of your March issue, we are told by your Philadelphia contributor that figures given in that city for terra cotta, in several cases recently, average "one-third

more than those for good cut stone work." This, in passing, we have noticed as showing the high rank which terra cotta of an artistic character has taken.

It is not claimed for machine-made blocks that the same boldness of design may be secured as in hand work. There can be no "undercutting" and no high relief such as is possible in hand work; but what we may claim is that a large portion, probably 75 per cent., of the terra cotta now being produced for structures where it is not employed strictly for ornamentation, can be produced of an equal grade by machinery, and at a cost of not over 5 per cent. of that attendant upon hand-molded goods. It should be borne in mind that this comparison applies to the molding of the goods only; the preparation of clays, with equal care, would be the same in both cases; but there are other factors of economy entering into the production of these goods which we may mention when we compare them with the hand-made goods. We name one or two of them:

First—The saving in weight, bulk for bulk, which we may fairly estimate at not less than 33 per cent. This in itself is no inconsiderable item, the saving covering one-third cost of material, its preparation for molding, its subsequent burning and handling to destination and laying in walls.

Second—The economical methods of handling (irrespective of weight, already noted) from time of molding to discharging from kiln which inhere to a machine-made as against a hand-made product. The walls of blocks being ordinarily of a uniform thickness, the drying is uniform, and, in the burning, no assorting and classifying, no selecting or setting aside for special treatment, as required in the production of hand-made goods, with no perfect balancing of material to insure uniformity of result by uniform treatment.

We had with us one day, while operating a machine producing ornamental blocks of excellent character, an expert terra cotta hand molder, a man of wide experience. He said: "Do you know that a skilled molder of terra cotta could not produce more than forty blocks of that character per day?" This was no doubt the truth, and, if so, the following comparison would hold good:

One expert bench man producing forty blocks, as against a gang of four men molding and delivering in dry room 3,500 to 4,000 blocks.

Let us now turn our attention to a comparison with ornamental brick of an equal character of workmanship. We have

no experience to guide us as to the total cost of these goods, but what we can say is this: As against brick, we note a saving of material, to start with, equal to 60 per cent., estimated by same bulk of wares in each case, and from a gentleman prominently identified with the extensive production of face, shape and ornamental brick for large Eastern markets we learn that a crew of one man and two boys can press and carry away about 1,500 ornamental brick per day, with an average wage of, say, \$4, while we are able to produce blocks that will represent over 25,000 ornamental shapes, and an equal number of common, at a cost for labor of not over \$5, in the same time.

It may be further claimed that while molded and ornamental brick and hand-made terra cotta are only employed for facing a wall, machine-made blocks may in nearly every case constitute the entire body of the wall, the strength being ample and unquestioned, as shown in our first paper.

We shall, perhaps, astonish many of your readers when we assert that machine-made hollow terra cotta blocks will render the builder more independent of other material in constructing the walls of a building than if using either brick, stone or terra cotta. In the use of brick either stone or terra cotta are called into requisition, in most cases of good construction, as trimmings. Brick necessarily depends upon one or the other for sills, and to almost as large an extent for caps, columns and capitals, unless the latter be of wood. Variety is also secured largely by the introduction of these other materials, zinc being also largely drawn upon for veranda and cornice finish, while in the case of terra cotta, as heretofore employed, its field has been quite exclusively (until of late) that of trimmings for brick construction, or, at the most, trimmings and facings for brick or steel construction; while in the case of hollow block we start with the lowest course in our foundations; we have the best known material for excluding frost and dampness from cellars. We put it into the forms we desire for molded water tables and for window and door sills and caps. We ornament with belt courses. We furnish imperishable columns for porch



A Residence Built of Hollow Blocks.

and veranda, including steps, and we cap all with a modern cornice. Our flues and chimneys are of the same general character of material and more easily laid than brick, and with safety against fire and dampness unknown to ordinary chimney construction. We may begin with the man who wants a thousand-dollar cottage, and insure him greater comfort and

permanence at no greater cost than for wood, and may also enter successfully to the man who wants a palace. We are able to compete with other material for most business and public buildings, leaving out of our list only jails and penitentiaries. In a word, what we expect to realize in the near future for hollow blocks is a wider range of adaptability for building construction than that held by any other material than wood.

In making this prediction we take into the account the fact that in many localities blocks will dispute the field with wood as no other material has ever been able to do.

We show on the preceding page a photograph of a dwelling designed by a Chicago architect, who has, perhaps, made a more careful study of this particular material in building construction than any other in this country. When introduced to him we found the walls of his office adorned with color plate designs of hollow block constructions—plain blocks at that.

The dwelling under consideration is not a mere fancy sketch, the details of which were left to be worked out, but, with the writer at his elbow to say what was and what was not practicable from the clayworker's standpoint, the form and style of every block entering into the dwelling was detailed in full size for the diemaker, where the dies were not already in use. Notice the details of the porch. The only hand work found is in the capitals and bases of the columns, the posts for the hand rail and cap and base of balusters, all else being regular machine work. The blocks for the half circle front are easily produced of any radius down to five feet. This dwelling and others planned and detailed were undertaken as studies in order to ascertain whether the various requirements of the architect could be fairly met by machine-made wares, independent of the aid of brick, and the result of these studies has served to convince the writer that very little hand work will be required to supplement machine work entering into high grade structures. Leaving out of the plans under consideration the porch, and there is no hand-molded material in the building, and the construction of a porch is the unusual, even with hand-made terra cotta. The steps designated as wood may be of hollow blocks up to five and six-foot lengths.

We readily admit that in the development of this industry a handworker or two will be required to round out a force in order to render the manufacturer independent of other sources of supply, but we think it safe to say that 95 per cent. of a wide range of work to meet architectural requirements may be met by machine-made goods, and to this date no handworkers have been employed by the ten concerns that have engaged in this ornamental building block industry.

We may here refer to one more feature of finish or ornamentation, which, it seems to us, will take on importance: In heavy structures, where a double course of blocks makes up the wall thickness, as in churches, school buildings, public halls, depots, etc., the face of the inner course of blocks may be employed for an interior finish with excellent effect, designs and colors being readily produced adapting them to this use. It may be asserted that for such structures a permanency of finish may be had that the plasterer has never been able to furnish, and we may expect that with this permanence there may be such a range of treatment of wainscote, column, belt course and frieze, as well as of design and color of wall body, as will enable us to dispense with plaster, easily damaged, and with coloring and frescoing, furnishing instead that which shall be free from the stain and discoloration, which, it may be said, almost characterizes the color work found on our church walls, the beauty of which vanishes at any appearance of dampness.

It has been the dream of a prominent terra cotta manufacturer in one of our principal cities for almost a decade, as his letters inform me, to be able to produce inexpensive machine-made blocks that shall, used singly—that is, walls of a single course constituting the wall thickness—have different color treatment and designs upon the inner and outer faces of the blocks, suited to the different requirements, and he tells me he planned a seaside cottage in 1889 to be built after this manner, with no woodwork but window and door frames in walls, but that he had been too much pressed with other matters to realize his dreams. This gentleman is prominent in the councils of the National Brick Manufacturers' Association, and the mention of his name would be the best of indorsement for the

work we have undertaken. Unconsciously to ourselves, we have been working out his plans, and share his strong assurance of the utility of such work, and that not only exterior walls, but partitions, will be introduced into good dwellings (not costly), dispensing not only with scantling, lath and plaster, but also with the fire ducts formed by them, which, if constructed with direct reference to coaxing fire from cellar to attic, could not well be improved upon. We will refer to this matter more in detail in a later paper.

(To be continued.)

TILE ROOFS.

OUR PICTURE is that of a little church located at Ithaca, N. Y. One of the most beautiful things about this building is its roof. Not alone is it pleasing in outline, not alone is it picturesque, but it is rendered more so from the fact that it is tile. Under any circumstances the red tile roof is beautiful. It is yet more beautiful where the outline is pleasing, and still more interesting when the tiles are of good shape. It is the artistic interest which attaches itself to tile which will lead to its use in this country. It has been used during recent years particularly on account of the picturesque quality. This is the vehicle bringing tile to a general use in this country. People will find through their use in this way that they make not only the most beautiful roof, but the best



Unitarian Church, Ithaca, N. Y. Roofed with Celadon "Open Shingle" Tile.

roof, and thus tile will come to be used commonly. Few roofing materials other than tile are satisfactory from a constructive standpoint. Certainly shingles are not; slate is an expensive roof to maintain; it affords very little protection against fire; a relatively slight increase in temperature causes the slate to shed off the roof and exposes the inflammable material under it. A metal roof of any kind must be frequently painted, which is an expensive process, and yet more expensive if the painting be neglected. A tile on a roof has the same merits as first-class clay products have for other building uses. It is a material which may be rendered non-absorbent. None of the extremes of temperature in the least affect it, and it is readily capable of being made into artistic forms. Fire or the elements have no effect upon a tile roof. It requires absolutely no expense for maintenance. It performs its service properly and has decided artistic merit. It is the coming universal roofing material. It will succeed because it ought to succeed. It is possessed of universal inherent merit.

THE EQUITABLE BRICK MANUFACTURING COMPANY— A BUSY HIVE OF WORKERS.



WITHIN FIVE MILES of the city's center, and in a direct line west of the City Hall, at Sixtieth and Lombard streets, stands the plant of the Equitable Brick Manufacturing Company, owned by the brothers, W. S. Kimball and Charles H. Kimball, characterized as "hustlers" and honest men. The yard is noted for its cleanliness, its excellent location and its charming rural surroundings. Broad, spreading timber, with lots of good undergrowth, lends picturesqueness to the good run of water and furnishes shade for the men when the sun works along in the zenith, defying all local conditions and cooling influences. A fine yard, with strong clay on the north side and a weaker one on the south, but a splendid paying investment, withal.

Under the control of W. S. Kimball, the yard was first started at Rabbit Lane in 1882, and in 1883 the present yard boss, Francis Robinson, joined in with his efforts and six feet one of manly grace. Finding the clay did not pan out to their expectation, the yard was shifted, in 1884, to Fifty-sixth and Walnut streets, and here they continued for six years, when Mr. Kimball was joined by his brother, Charles H. Kimball, and together they drove in new stakes at their present quarters, W. S. Kimball gradually surrendering control of the yard to his brother Charles, while he gave his attention to real estate operations, until now he is regarded as the pioneer of good, fashionable dwellings, which are erected under his personal supervision, and of a natural sequence built with the best pressed brick coming out of their yard.

Covering over thirty-two acres, they turn out on an average, with their Chambers machine, 56,000 daily, and their season's average is about twelve million. Of the daily turnout they repress about 12,000, and keep in addition five hand gangs, who turn out about the usual 2,500 per gang.

A 100-horse-power engine of the Skinner Engine Company's make and three Sciplos boilers, two 100-horse-power and one 80-horse-power, do the work. The clay is hauled from the banks and dumped on to the belt, which, carrying it on to the pugger, feeds the machine, and thus one hundred men are constantly employed. Four fine tempering pits, of 15,000 capacity, make the line symmetrical and orderly in the view from the machine shed. In the general distribution of the make-up there are six, and three steam drying sheds; six thirteen-arch Dutch up and down-draft kilns, with a setting capacity of 275,000.

The yard boasts of a good entrance. Emerging from a well-rolled road, one's attention is drawn to the red stretcher two-story brick office, with a trim grass plot, fenced around, and, fowering above from the brick paved sidewalk, stands a one-hundred-foot flag pole, while in the line contiguous is seen the whitewashed stables, with their chocolate-colored gates, as a splendid set-off against the smoke-dimmed engine room and huge brick smokestack.

Eight double teams do the work of hauling "salmon," "hard," "machine stretcher," "machine repress," "hand-made stretcher" and "hand-made press" brick, which have become a synonym of good quality from here to Chester.

In 1895 the yard was opened on the 20th of March and did not shut down until the 1st of January, 1896. With only three months of partial idleness, the yard was again opened on the 1st of April, and continued working, turning out 11,000,000 assorted between this time and the 1st of November. The reports for this year thus far are of a roseate hue. They have the contract for the huge building of the Gibson estate (lately burned out), at Thirteenth and Market streets, for 1,500,000; ninety-five houses for G. W. Sherman, at Fifty-third and Master streets, 2,000,000; Fifty-ninth and Market streets, 150,000; Forty-ninth and Florence streets, 450,000; Forty-fourth and Pine streets, Forty-first and Locust streets and Thirty-fifth and

Chestnut streets, 700,000—not forgetting the huge planing mill for Melvain, which calls for 500,000, and a mill at Clifton, to which they will haul 100,000.

Their best day was in June this year, when they hauled from the yard 108,000, and on their respective lines of doing business it must have been a profitable day. Their ways are good ways—a good deal of application, courteous, never stinting, but bang up in contract making, drawing 70 per cent. of their money when the second floor joists are up. This covers about all as to the Kimballs—two bright men. I must now turn and march over the clay banks to the yard yonder, which is known as

—Honest John Hanarty & Sons' Brick Works.—

Eleven years ago this clay bank was deserted, and, in harsh



Works of the Equitable Brick Co., Philadelphia.

terms, was declared N. G., when along came sturdy John Hanarty, broad and strong in wind and limb, ready for hard work, and possessed of an indomitable will, backed by his son, who, possessing all the attributes of youth, coupled with a good, amiable disposition, was ready to put his shoulder to the wheel and "help the governor out."

The approach through Rabbit Lane is one of the most picturesque spots around the old Quaker City—high, rising ground, with a framing on either side, formed by a steep bank and a wild hedge row, and fringed with heavy timber, that forms a perfect canopy, shutting out the broad glare of the fierce sunshine, which, as I passed along, was stiffly beating around 92 in the shade. Breaking my way through a gap, I found myself in a snug little yard of about five or six acres, and in the pres-

ence of the two Hanartys, who were just "firing up" a nice little 180,000 in answer to an urgent call. The small Chambers machine of 25,000 daily capacity was working its utmost, and every man from the shoveler to the hacker was hustling for all he was worth, pushed along by the efforts of the little Chandler & Taylor 35-horse-power engine and one of Dougherty & Feely's 70-horse-power boilers, of Chester.

Along the line stands four Dutch up-draft kilns of 180,000 capacity, from which they are able to get by hard work and good management about 10,000,000, and sometimes 11,000,000, in spite of the rather poor quality of clay, being mostly loam and sand, requiring careful manipulation and handling from the end ent to the drying sheds.

Here the lap drying shed is wholly used, steam being ignored. Hard, stretcher, repress stretcher and press are the commodities, and, as John Hanarty says, "We make them and we sell them. Last year was a good one, but this season beats it all into smithereens."

The general cry this year is that the smaller yards are doing the business. Some of the larger yards away on the south of us are complaining, and this I attribute to the fact that this year's building is at least four to five million dollars behind the operations for the first six months of last year.

But for the terrible fire which consumed nearly the entire block at Thirteenth and Market streets, in February last, this season would have been as devoid of activity as 1889. But there remains for the early fall a good period. Five huge office buildings and an apartment house, aggregating \$3,500,000, and some residential operations to the extent of \$2,000,000, have already passed the border line of uncertainty, and before another two months the ground will be broken. This alone will call for some tall hustling among the brickmakers.

W. P. LOCKINGTON.

OBITUARY.

Death of Dr. Julius Aron, a Noted German Clayworker and Scribe.

THE THONINDUSTRIE-ZEITUNG brings to our notice the death of Dr. Julius Aron, one of the founders of that journal.

Dr. Aron was prominent in German clayworking circles, and was an associate of the late Dr. Seger. Much work was done by him along the lines of ceramic research, and he investigated subjects like "The influence of non-plastic materials upon clay," "The action of quartz sand and lime during the burning process," "The manufacture of baryta cement and its use," and many others. Dr. Aron was a thoroughly educated man and an expert chemist. He was one of the first chemists who devoted their energies to the service of the clay industry, and in that capacity he co-operated with Seger in Mr. Hoffmann's laboratory. In 1876, he, together with Dr. Seger, left that establishment to found the Thonindustrie-Zeitung and the laboratory connected with it. Owing to poor health he retired from his activity in the scientific and journalistic work in 1891, but even after that he manifested great interest in the progress of the art. Dr. Aron died on the 14th of June, in his fifty-seventh year of age. He was a man esteemed by all for his integrity of character and his zeal for the welfare of the clayworking industry.

S. K. Fletcher, a Charter Member of the N. B. M. A.

IT IS WITH real sorrow that we chronicle the death of Stephen Keyes Fletcher, of this city, who died Wednesday, July 7, of softening of the brain. All readers of the Clay-Worker know of Mr. Fletcher as a manufacturer of brickmaking machinery. Many knew him personally, particularly those who have attended our Annual Conventions, his interest in the Association and his genial disposition making him very popular. Mr. Fletcher's character was not one that gained by perspective or distance. Those of us who knew him best, those who had the closest relations to him, saw in him the most to admire. As we have said, clayworkers generally knew him best as a kindly, progressive, whole-souled business man. Those of us who were near him, who knew him in his family, in his social, church and fraternal relations, recognized him as one of the truest of men. The writer, who has known him for nearly thirty years, in all these relations, can look back over this history without recalling the least shadow of anything uncomfortable or unworthy. There are very few men who can stand examination from so many points of view. One meeting him in his family would be impressed with the idea that his chief thought was the immediate comfort and pleasure of those

around him. One cannot exaggerate in speaking of his gentleness and kindness and his untiring industry in all that related to his domestic and social life. We speak of these matters definitely because the readers of the Clay-Worker, who must have known him in a more distinctively business way, could not have the opportunity of knowing the breadth of the man as it has been our fortune to know him.

He was the eighth of nine sons of the late Calvin Fletcher, a name prominently associated with the wealth and development of this city and State. He was born in this city May 30, 1840. He was educated in our public schools. In 1863 he entered Company E, of the Thirty-third Indiana Regiment, as a private, and was afterwards commissioned as Adjutant in the One-hundred-and-fifteenth Indiana. He was a good soldier, and served at the taking of Cumberland Gap, the siege of Knoxville and Strawberry Plains. For many years after the war he took a great interest in the Indiana State Militia, of which he was quartermaster. He was also prominent in the formation of the Indianapolis Light Infantry, an organization of national prominence. He was a member of the Grand Army of the Republic, the Loyal Legion, and was a Thirty-second Degree Scottish Rite Masons and a charter member of the N. B. M. A. For many years he was engaged in the manufacture of brick in this city, as well as in the manufacture of brickmaking machinery. His first partnership in business was with Robert Thomas,



S. K. FLETCHER.

in the firm of Fletcher & Thomas. It is in this relation that he was prominently known to clayworkers generally.

Mr. Fletcher was ever ready to contribute to the happiness and comfort of those around him. His generous nature prevented him from being a money saver. That was not his chief purpose in life, but those of us who knew him personally recognized his worth from a broader point of view. The memory of no man in this community can be held in higher esteem. He leaves a widow and three children.

Lewis Oliff, Shreveport, La., dies Suddenly.

Lewis Oliff died at his home in Shreveport, La., July 10, of heart failure, after a brief illness, from which it was thought he would speedily recover. Mr. Oliff was born in England, but came to America in early manhood, and, after living in Michigan for a time, he moved to Louisiana and engaged in the brick business. He has been an active member of the N. B. M. A. for several years, attending the Conventions regularly. His was a modest nature that shrank from public display, but in a quiet, unobtrusive manner he did what he could to promote the welfare of the Association, in which he took a deep interest. His warm social qualities won for him many friends, who will mourn his untimely end.

Written for the CLAY-WORKER

BRICKMAKING IN MAINE.



OF THE DOWN-EAST brickmaker the perusal of the Clay-Worker is like reading a romance in an unknown tongue. So different are the methods pursued and so endless the variety of tools to which our attention is called by the floods of circulars and pamphlets extolling their virtues—tools which would be about as useful in our yards as a threshing machine in a dry goods store—that we are lost in astonishment at the so-called “improvements” in the brickmaking art, and wonder if we are lagging so far behind in the march of progress as all this would seem to imply.

With your permission I will give some brief sketches of the results of my observations and the conclusions arrived at after half a century's experience. As such sketches must of necessity partake more or less of the autobiographical, I hope the too frequent repetition of the personal pronoun, so revolting to the modesty and natural diffidence of all clayworkers, will be excused.

My father was a brickmaker all his days, and, of course, died poor in pocket, but rich in experience. All the old brickmakers in this part of the country died poor, and there is every indication they will continue to do so as long as they follow the business. “Poor, but honest,” described the character of the average brickmaker, and what any of them lacked in honesty they surely made up in poverty, so the term may be said to apply with propriety to all.

As regards the improvements in the art of brickmaking, I contend that there has been practically none since the dawn of history, and before, for history itself stands on a foundation of brick work. The methods pursued in this section, which I propose to prove by results to be the best suited to our conditions, are as like as the difference in local peculiarities will permit to those followed by the contractors who furnished the bricks for the Tower of Babel. The failure of that enterprise I have never understood to be through any fault of the brick work, but rather in consequence of what, in modern parlance, would be denominated too much or too great variety of “chin” on the part of the workmen—a difficulty which wouldn't be considered a serious pullback by a modern boss on a Hudson river brickyard.

The only changes which have been made for generations in brickmaking down East have been to increase the output at the expense of the quality. As the principal expense in brickmaking is for unskilled labor of a character which cannot be done by machinery, there can be no great improvement in the making of common brick. Twenty years ago I was in a yard in Massachusetts which had been fitted up at an expense of \$200,000. Almost within a stone's throw of this magnificent plant was a ridiculous looking concern where they were making bricks precisely as they would have made them a century ago. Two years ago I revisited the locality, to find the old mudslingers still at it and the much-vaunted up-to-date plant abandoned, after two or three years of experimenting, the only result of which was to dissipate the entire capital invested in it. The history of this enterprise is the history of dozens of others throughout New England. In every instance within my knowledge the attempt to make brick in Maine by any of the methods in vogue in the West and South have proved utter failures, and for reasons which will become apparent as I go on. In the first place, most of our clay seems peculiarly adapted to making soft mud bricks, or “slop” bricks, as I think they are termed in the West. This clay, in its natural state, is of a hard, almost insoluble nature, a sort of greenish gray in color, beautifully stratified, and lying in sheets of from ten to twenty feet in depth. Underlying this sheet of gray clay is a bed of from twenty to fifty feet in thickness of blue clay, which, in most locations, has been under salt water at some period in the world's history, and is so impregnated with salt as to turn white

in burning. The gray clay burns a beautiful red, varying in intensity in different localities. The blue clay is much the easiest to work, as it needs no preparation and makes a closer grained, stronger brick than is produced from the gray clay, and for any purpose where color is not a consideration is a very desirable brick. The gray clay, in order to be made into mud, has to be either dried or frozen, when it readily pulverizes on the application of water, and is ready to be molded into bricks.

Of course, numberless machines to crush and grind the raw clay have been invented, but experience has demonstrated that the most economical way to prepare the clay is to let nature do it, and the site for the plant is usually selected with strict reference to its advantages in this respect. The ideal conditions are a level place for the yard, with a clay bank behind it, with just slope enough to work on with horses and extensive enough to supply the necessary amount of dry clay, which is obtained by going over it with a pair of horses, drawing a shave or plane, and cutting to a depth of two or three inches. In ordinary weather this will dry in one day when it is scraped down the gentle slope to the machines, where it is dumped into a pit, or “tread,” as it is termed, sufficient water put with it to soak it, and in the morning it is ready to be made into bricks.

By the process in vogue in this section three men and one horse constitute a crew, and the entire cost of fitting up a plant for them to operate to advantage will not exceed \$300, and



Some of the Workmen of the Upper Hawthorne Brick Works.
See next page.

what bricks they can make can be made as cheaply, if not cheaper, than on a larger scale, as a large yard is simply a multiplication of the smaller one, each machine, with its crew, being a distinct factor in the process. The machine used is usually little more than a pug mill, with a very simple striking arrangement in front, which fills the molds, instead of doing it by hand, as formerly. This and taking the bricks away from the machine with trucks, instead of carrying them off by hand, one mold of six bricks at a time, constitute all the “improvements” in down-east brickmaking in the last hundred years, and neither of these, has added to the value of the product, but quite the reverse. Better brick can be found to-day in century-old houses in the country than can be bought in any of our yards, and these bricks were usually made in the neighborhood where wanted for use by the same methods employed in the time of the Pharaohs.

In my next I shall endeavor to give some idea of these early methods, with a few side-light views of the men engaged in the business.

MUDLARK.

The best modern investment is judicious advertising. It pays a larger percentage on the original capital than any other bona fide investment.—J. B.

Written for the CLAY-WORKER.

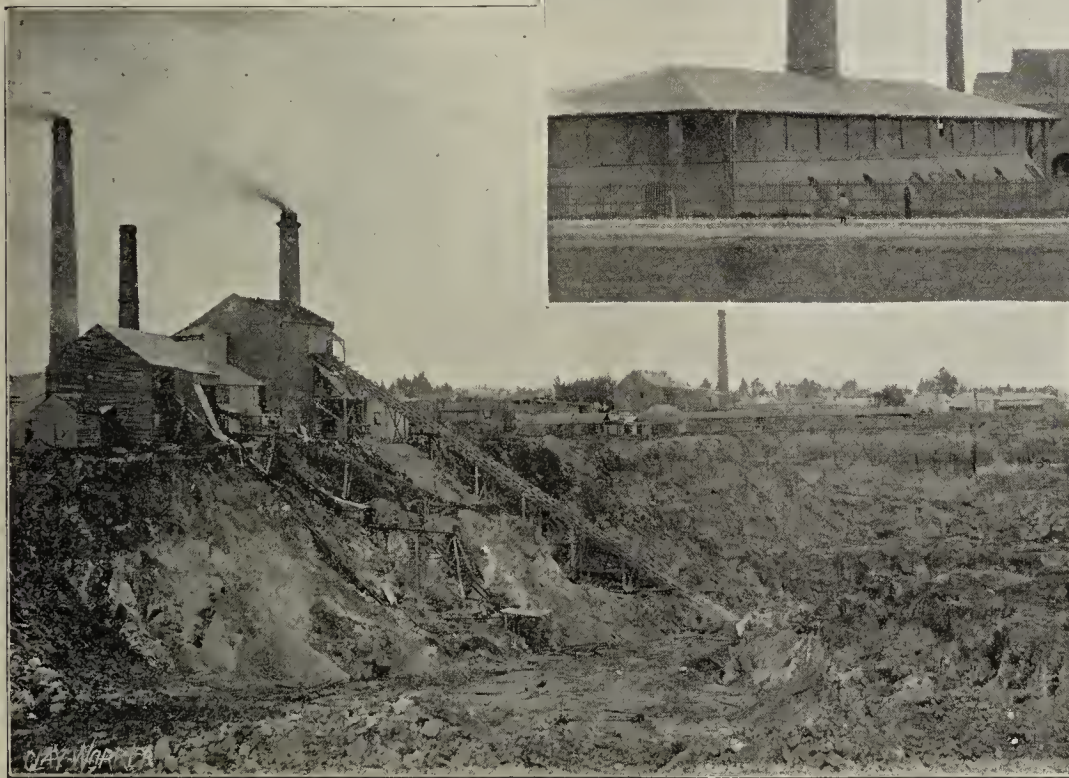
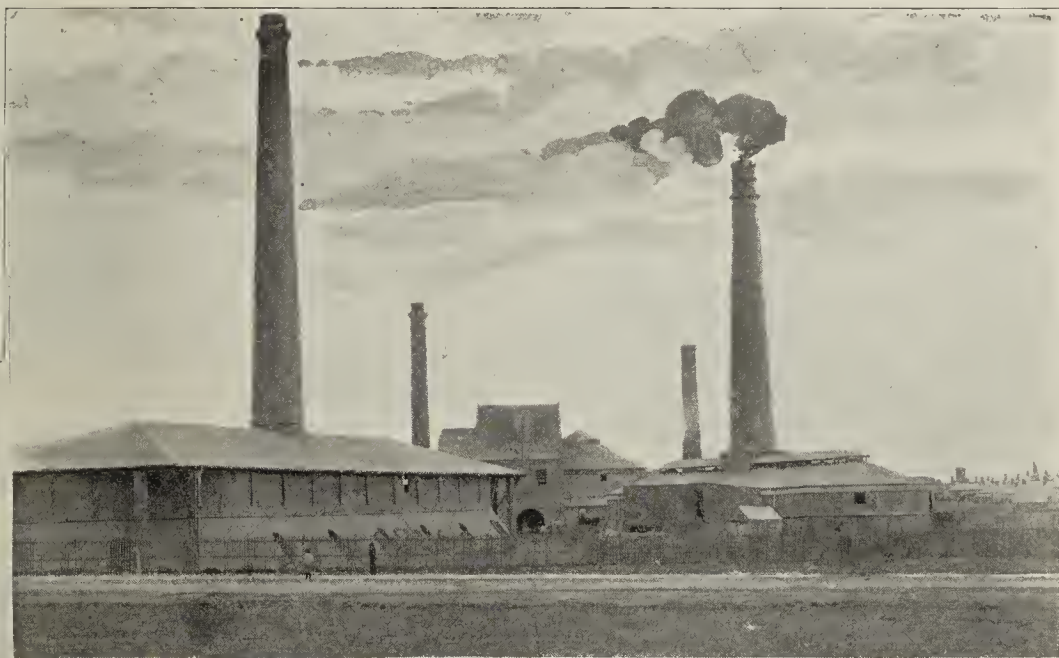
THE CLAYWORKING INDUSTRIES OF VICTORIA, AUSTRALIA. No. 5.

BY F. A. CAMPBELL, C. E.

ALTHOUGH THE BULK of the clayworking manufactories of Melbourne are in the northern suburbs of Brunswick or Northcote, upon the vast shale beds which underlie these districts, there are a few others scattered around upon the eastern side of the city, one of which I visited recently, with the view of finding out if they presented any new features of interest. I found, however, that I was still amongst the shale beds, the Hoffmann kilns and the dry brick presses, and that the big excavation of the upper Hawthorne Brick Company's works greatly resembled some of those belonging to the other works which I had already visited. This being the case, a brief notice of this company's establishment will be sufficient. The appearance of the main portion of the works from the road is shown in photo No. 1, two Hoffmann kilns being in front and the buildings containing the machinery further back in the center. A view taken at the rear of these buildings is also shown (photo No. 2), in which the clay pit and inclined tramway appear. As the

ed, so that about three years ago the original owners took over the concern again, and are now working it.

The clay is almost identical with that at Brunswick, only it is distinctly harder. It is drawn in trucks up a very steeply inclined double tramway, and the clay, tipped from the trucks, goes directly into dry pan crushers of the usual kind, with perforated bottoms. Disintegrators were tried for a time, but the stuff was too stubborn for them, and the wear and tear formed so expensive an item that they were discarded in favor of the dry pan crushers. From beneath the crushers the material is elevated again to the floor over the presses, into the hoppers connected with which it is fed by hand. The presses are of Bradley & Cravens type, of which there are three. One of these has recently been remodeled by the proprietors so as to cope better with the hard material with which they have to deal. The geared driving wheels and the shaft which actuates the press have been considerably strengthened, and a very massive



Works of the Upper Hawthorne Brick Works, Melbourne, Australia.

workmen about the place showed a keen interest in the camera and a considerable anxiety to have their photographs sent to the "States," I got the Manager to send a few of them up to the office, where they grouped themselves picturesquely along the wall and assumed that pleasantness of expression considered necessary for the purpose of photography. The two gentlemen with their coats on belong to the office staff, and the third from the left at the rear is the practical Manager of the works, Mr. F. Fritsch, Jr.

These works are, as might be judged from the appearance of the pit, of some years' standing. They were originally started by the present proprietors, Fritsch, Holzer & Co., in 1872. Then, in 1888, the example of many other private concerns was followed, and it was floated into a company, which, still following a common example, did not turn out as well as was expect-

and workmanlike machine is the result.

From these presses the green brick are run into the Hoffman kilns, which are of the ordinary pattern. The method of burning is, generally speaking, the same as is adopted in the Hoffman kilns elsewhere, only I observed a somewhat novel arrangement for steaming the green brick, the particulars of which I am not at liberty to give. It appears, however, that it is possible, under the plan in vogue, to steam the green brick at any time and in any part of the kiln, quite independent of the other firing which may be going on.

There is no doubt as to the good quality of the brick when turned out. They are true in shape and of a uniform warm red color. Mr. Fritsch speaks of business in a more hopeful style than many of the other brickmakers, and is the first amongst them to say that he has as many orders in hand as he can cope with. The price he gets at the present time is about \$5 per thousand.

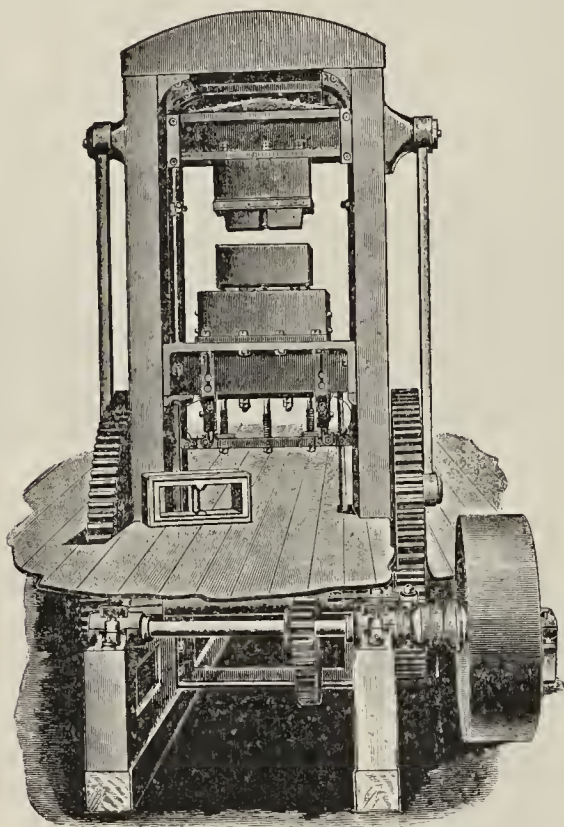
The brick from these works are not free from that whitish efflorescence which is found so commonly on the products of brickyards all over the world, but they are not marked here to any great extent, and a stack of very fine brick was shown me, burnt in the Hoffmann kiln, without a trace of this disfigurement upon them. "These are burned with wood as fuel," said the Manager, "and if I could get my own price I could turn them all out like that." A question as to the method of using

wood in a Hoffmann kiln received only a laugh by way of reply. Mr. Fritsch knows when to be silent as well as when to talk.

About two hundred yards to the west of the main building there is another part of the establishment in which black brick are produced. The clay is obtained from the ground close by, near the surface, and is of quite a different type of shale, being strongly impregnated with iron. After being passed through the crushers and pug mill, the brick are made by hand, dried under open sheds and burnt in the old style of rectangular kilns. Closely inspected, they appear of a dull red, covered with small black spots; at a little distance they have a fine uniform black-red look, which is very taking when built in a wall, especially when set off with red brick facings. They bring \$10 per thousand, and are well esteemed by both contractors and builders.

AKRON ITEMS.

THE AKRON FIRE BRICK COMPANY, the largest in Summit county, located on Bank street, in East Akron, was incorporated March 25, 1882, with a capital stock of \$50,000. The President of the company is C. A. Allison, and Byron M. Allison is the Secretary, Treasurer and General Manager. Besides making a superior quality of fire brick and deal-

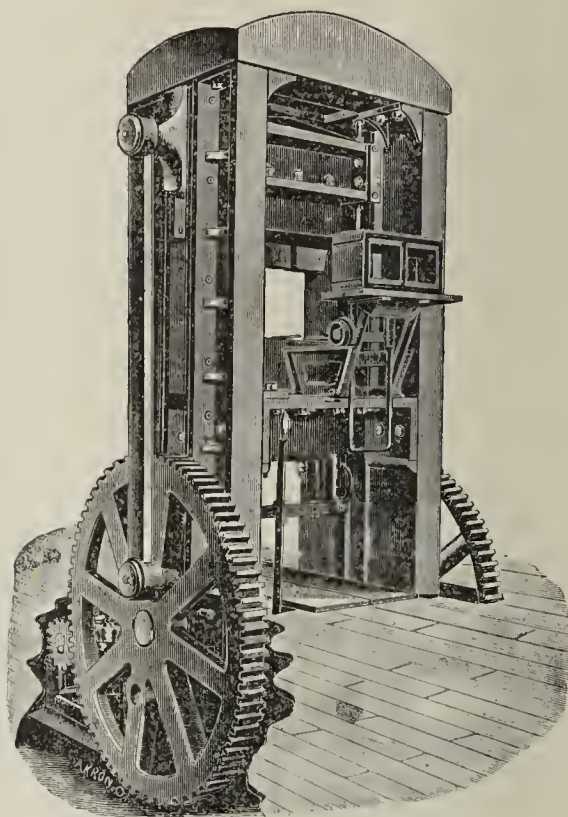


No. 1 Front View.

ing in all kinds of fire clay specialties, furnace linings, etc., the company have the only machine built and are the only manufacturers of the American hollow building block, a description of which your correspondent desires to give.

The American hollow block is entirely unlike anything of the kind and for the purpose, that has ever before been produced. An examination of its merits will convince all of its practical utility. In 1888 John Lee, of Sterling, O., first obtained a patent for a hollow building block. Dissatisfaction with his first efforts induced him to proceed further with his ideas, and on June 25, 1895, a new patent was given him, and so different from the first was the result of his later efforts that it virtually made a new block. The American block is one of beauty and of superior strength. Its corners and edges are nicely beveled, resembling dressed stonework. It may have an ornamental face or be plain, and can be made of various shades of color to suit the taste. Unlike all others, it is hollow vertically, thus allowing a free and unobstructed circulation from bottom to

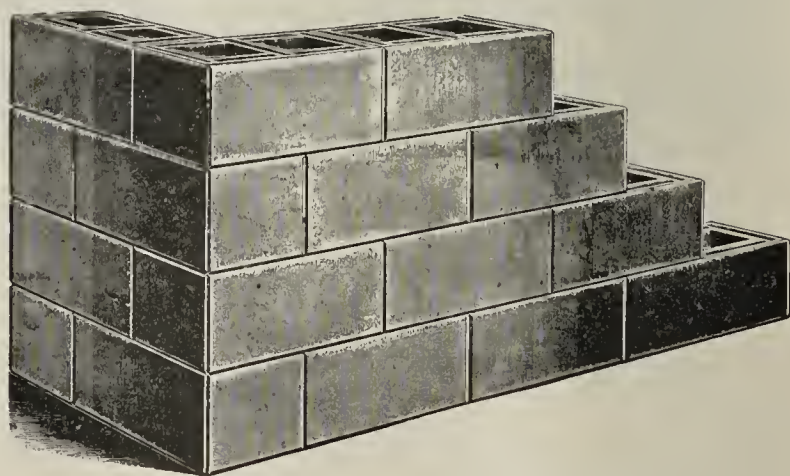
top of building, and no matter how large the building may be, there is a connection from one block to another throughout the entire structure, which insures freedom from dampness at all



No. 2 Back View.

times. It is frost-proof, fire-proof, warm in winter, cool in summer, and always dry.

The form of the block being new, a special machine had to be constructed to make it. It is a press of great strength, but is simple and durable. It exerts a pressure of one hundred tons on each block while being made; thus the walls of the block are unusually dense and compact. This press turns out a finished block at each revolution, and may be run as fast as the expertness of the attendants will permit. Neither the block nor the press can be fully appreciated by a description, but must be seen to determine their fitness and perfectness. The size of the block now being made is 16 inches long, 8 inches wide, 7½ inches high, with vertical openings and a partition crosswise in the center running half way down, and is similar in shape to a cigar box with top and bottom removed, and a partition thrown across and extending down half as far as the sides. The sides and ends, and also the partition, are one and a half inches thick on the edge, but diverge from the edges to the center, so that in the center they are one and three-quarters thick, thus bracing the walls and adding great strength. All the out-



Hollow Block Construction.

side corners and edges are beveled back one-half inch, and, when nicely pointed up, make a beautiful bond. There is also a mortar groove running entirely around on both edges. When laid in the wall these grooves register, and, being filled with mortar, preclude the possibility of dampness getting through at the joints, and also lock the blocks together in the wall. For the setting of window and door frames there is made on the

ends of the blocks a vertical channel about two inches wide and half an inch deep, a strip being nailed to these frames outside, and, corresponding with the notch in the block, holds the frames securely, and also prevents cold or moisture getting in around the frames, as is often the case with plain blocks. The press has a capacity for making a block 18x24 inches, but the size now made seems to be the most in demand.

Cut No. 1 shows the finished block ready to be placed upon the pallet board and carried away to dry. After the clay has received the pressure on the downward stroke, the machine, on its upward motion, draws the brick up about one and a half inches from the die and sufficient to run the carriage (shown in cut No. 2) under.

The pallet board is placed on this carriage, and as it is withdrawn the brick is turned on its side on the pallet, and is then ready to be taken to the drier. Two hands only are required at the machine, one to put in the blank of clay, the other to take off the finished block. As the machine makes one perfect brick at each revolution, it can be seen that the capacity of the press is only limited by the speed and dexterity of the men attending it.

Cut No. 2 shows the finished block delivered on the pallet board on its side ready to be taken to the drier. In this cut can be seen the little carriage used in removing the block from the press. It is run under the block and the handle slightly depressed. It is then withdrawn until clear of the machine, when the handle is pushed downward until it stands perpendicularly. The block is then ready to be removed and the operation repeated.

The blocks now being made are buff and are very beautiful. Being made one at a time, they are uniform in size, and each receives the same amount of pressure. Parties are now negotiating for a large amount of territory for the sale of these blocks. It was never the intention of the inventor or the manufacturers to in any way compete with the open-end block, made with the auger machine, but this block is intended for a better class of business. We bespeak for Mr. Allison and his company all the success his superior article deserves.

—Struck by Lightning.—

On Monday evening, July 5, Akron was visited by one of the worst rain and electrical storms she has had for years. The rain fell in torrents and the lightning was something terrific. During the progress of the storm lightning struck the 70-foot stack of the Akron Brick and Tile Company's plant, tearing it down, cutting through the roof and damaging the plant to the extent of \$500. Fortunately, no one was hurt, as the company had shut down for repairs Thursday night previous, intending to start up on the morning of the 6th. Besides the actual damage done, the loss from delay will be heavy, as the company is crowded with orders, and only shut down of necessity for a few days.

—Death of a Pioneer Clayworker.—

Thos. Robinson, Akron's oldest sewer pipe and pottery manufacturer, died at his home in that city Wednesday, June 30, of apoplexy, aged sixty-two years. Mr. Robinson came to this country from England when young, and in 1857 settled in East Akron, then Middlebury, O., and engaged in the pottery business with Mr. Richard Whitmore. From a small beginning sprang the large firm of Whitmore, Robinson & Co., of which Mr. Robinson was the Treasurer. He was also Vice President of Robinson Bros. & Co. and one of the Directors of the Crown Fire Clay Company, of Canal Dover. His whole life was spent in the manufacture of clay products. He was the father of seven children, five of whom, with his wife, survive him. He was a member of the First Presbyterian Church, a liberal contributor to the church of his choice and all calls for charity. By his death Akron loses one of her foremost business men and citizens.

A BRICK COMPANY DEFEATS A SUIT FOR DAMAGES.

THE PURINGTON-KIMBELL BRICK COMPANY, of Chicago, recently defended a suit for personal injury for \$25,000. Some two years ago one of their teamsters, in unloading brick at the Western Electric Building, in that city, by throwing them through a hole in the sidewalk, hit a laborer employed by the contractor on the head with a brick, cutting a hole in the scalp one and one-half inches long. Some two months later a so-called attorney persuaded this laborer to commence suit as above mentioned, making an agreement that whatever was recovered should be equally divided between the laborer and so-called attorney. The case came up in the Superior Court of Cook county and was tried before a jury. For eight days of sweltering weather the time of the court, lawyers, jury and witnesses was taken up. The jury was out about fifteen minutes and returned, rendering a verdict for the de-

fendant. The evidence failed to prove that there was any negligence on the part of the company; failed to prove that the injury was in any sense serious, and convinced the jury and court that but for the reliance of the so-called attorney on the fact that average juries generally mulct corporations no suit would ever have been commenced. There is nothing so menacing to a manufacturer as the danger of a jury in suits for personal injury. In nine cases out of ten the sympathies of the jury go out to the workingman at the expense of the employer. In this particular case it is true that the jury had common sense and believed that a corporation had some rights, but the corporation was compelled to employ lawyers, secure the attendance of witnesses and personally attend to the case at great expense and sacrifice. For what? That an attorney might have the opportunity to obtain a fee. The Purington-Kimbell Company could have settled this case for a small sum, but preferred to fight for justice rather than be blackmailed.

A TERRA COTTA "TALKING BIRD."

We are indebted to Evens & Howard, of St. Louis, for a fine office ornament in the form of an immense terra cotta owl. From its appearance we are sure that it is a reproduction in clay of the bird Mr. Swegles told about at the Buffalo Powwow—a "talking bird"—and as it will be a constant reminder of that hilarious occasion it is a doubly welcome addition to our



Swegles "Talking Bird." Executed in Terra Cotta by Evens & Howard, St. Louis.

collection of clay curios. His owleness now stands guard over our "strong box." As may be seen from the accompanying picture, he is a beauty. He is thirty inches high, buff in color, and finely modeled. Evens & Howard may well be proud of him. He really talks for them, as good work speaks for itself. They are now giving special attention to architectural terra cotta, and are evidently equipped to produce the finest of ware. Theirs is one of the greatest clayworking establishments in the world. Their various fire clay products are known and recognized as standard throughout the States and Mexico, and their terra cotta will undoubtedly achieve the same distinction, for whatever they do they do well.

Written for the CLAY-WORKER.

THE NEW YORK MARKET.



THIS LETTER is written with a few days of our national holiday—July 4. There are far less new brick under the sheds than for many a year. By new brick is meant this season's make, and spoken of among the trade as old and new stock, not that the quality is any different. As for the old stock, it is like the winter; it lingers under the sheds—not all shipped,

by any means. In years past the Fourth was nearly the middle of the brick season. This year some yards have been running a month, while the majority have been going from the 15th of May, a few earlier in the month. Take May 15 as the starting point. There have been nearly two weeks' lost time on account of wet weather. In that time one yard has only made two days' time in one week, which is only one case to show how much lost time there has been. Have not had a full week thus far, but the trade is not suffering for the want of brick. Speculative building is slack—in fact, dead—as one can see by the report of the transfers of real estate. If it should rain about half the time for the rest of the season the make of common brick would last till the new stock of '98 was on the market.

The day we celebrate will not be one long to be remembered among the bosses or men as the year in which, for the one, much money was expended for fireworks, the other for beer. If the weather should keep good so that they could make a ringer the two weeks before the Fourth it would mean about \$16 to \$18 to each man, in some cases more, in others less. The single men pay \$8.50 for board for that time; what is left for—will I say clothes or rum?

What the future of the brick trade is to be as a money maker seems to cause a variety of opinions. As "Tempered Clay" says in your last issue, "the output is far in excess of the actual need." How prices are to be restored, not to a two or three-dollar-per-thousand profit, but to good, fair returns on the investment, is the question. The very low price which now prevails should be one of the strongest factors in the increased use of brick, as any staple which runs low is always used more. In the case of brick, and all else which enters into the make-up of a house, prices are way down. Money by the million is looking for investment, and still the call is dropping off; prices the same. Viewed from any standpoint which can be taken, or argument which can be brought forth, as regards making good brick by setting and burning, and putting in this improvement and that, seems a waste of time, for the simple reason that there is no one who makes common, but makes the best he can, as the trade demands it. I think the quality part would play but a small part with the question of price. Unless there is a specification tacked on that such or such a brand must be used, the inferior brick would sell, to the exclusion of the other. If all the yards in the country were run by a couple of horses on a sweep, as in the good old times you hear the old brickmaker talk about, the change from an empty to a full pocketbook would soon be apparent. When the cost of some of the modern plants, so called, is compared with the sunshine yard there is quite a percentage of difference to be made up. Of course, the claim of making brick so much cheaper is set up. But do they? There is a modern yard erected near here and in operation. Their cry is that it is costing them too much per thousand to make and that they must reduce expenses. They make 40,000 per day, and forty-three men have been counted at work at different times and by different people. To sum up the trade, the cause and effect of no profit can be traced to the man or men with money who were looking for the experience in the manufacture of brick, in the erection of plants which are too large for the locality, and thus have to use the railroad to throw their surplus stock off. The experience of loss came to them without much loss of time.

The death of Mr. Crary at the age of eighty-three shows that in his case, as well as many other old brickmakers, it is not an unhealthy trade, but rather conducive to long life. He has done his work, and none can deny that he was always ready to give his fellow-craftsmen the benefit of his views on the subject of brickmaking.

—Making Brick Cheap.—

The tide-water man is not at rest unless he can cut down expenses. If nothing else can be touched, he will see if he cannot beat his neighbor in turning out more brick with less men than he does. He will figure on it, and come to the conclusion that his foreman has been using too many men, and he is going to show him that it can be done, and I regret to say that some

who have worked on the yards since boyhood, and are now in charge of their own yards, have the same idea. The number of men they seemed to think would, could or should be enough to do all the work on a two-machine yard, which turns out 45,000 per day, and not have a man work when it rains, is thirty-two, all told, without the foreman or engineer. Quite a margin on a production of about 1,400 brick per man. With reduced wages and such an average of output, they would no doubt be in shape to show a balance on the right side of the ledger. The work to be done with that number of men is to fill the pit, mold them out, set them, burn them, load them, wall and daub kilns, wheel or haul wood around kiln, clean up—in fact, these thirty-two men must do it all.

—How the Work Is Divided.—

Shed gang, two setters and six wheelers to put in the two pits molded, and they are done for the day. As is often the case, the wheel may be a long one, as in the beginning of the season all brick may be put in one kiln, and that is in the middle of the shed. Some of the yards have four machines, with two yards to the machine, and run but two machines a day. The six wheelers will not put in the two pits. Those are all that is over, the second hand being one of the setters.

—Around the Machine.—

Four truckers, a dumper, molder, sander, two pit shovelers, one sand boy, with one cart man drawing sand, and one bank man, or, for the two machines, twenty-four men. Every man at work, and just thirty-two; not a man to put in the place of one or more who might be sick or loafing. The foreman cannot send a brick wheeler to take the place of a trucker if he does not come out, as he must get his brick off the yard to put others on; or, if a wheeler or two is off, the same result. He will have to let a machine lie idle and not produce according to the number of men at work.

—After the Pit Is Out.—

One man will drive horse filling pit, another will level pit, and three will hack the brick, while the pit shovelers go to the bank to cut clay. The boy will edge his brick, which will leave the molder and three men over to work in the shed in the afternoon, to set in a hack or prepare kiln for burning. How will it work? It is all fair sailing. The foreman gets to the yard in the morning and finds a vessel there to be loaded, one that will carry, say, 70,000, and it will take ten men half a day to load her. He has but eight in his shed gang. He sets them at work. At about 3 o'clock she may be loaded. How many brick will they wheel till it is 6 o'clock? Not many. He may be called on twice a week to load a vessel. How is he going to keep it up? Or, if a barge comes in, taking 250,000, it will take the best part of three days, with ten men, to load her. What can he do? Nothing but double his hacks and let them stand, hoping that Providence will favor him with dry weather.

—Burning.—

Kiln must be done, as sand for molding must be had. If the kiln has fifteen arches, three to four men will be around it all the time. That means one of his setter gang taken away for a week, so that he will be able to have set only three hacks, when he is making four, or at the end of the week he will have three pits of brick on the yard in double hacks. During the week the vessel may come to the yard. What can he do but knock off a machine or let the boat lie at the dock? As one looks over a lot of men at work in the afternoon, say after 3 o'clock, doing work that you know is not in their day's work, it shows that overtime is being made. Follow the matter up and you will find that thirty-two men cannot do it, and to keep the work going the men can make overtime or outside men are put on by spells to help them out. Is it fair to go around and say, "I am making brick with so many men," and create dissatisfaction among other bosses with their foremen because they do not do the work with less men?

—A Case in Point.—

In conversation with one of the bosses, a little while back, I asked him how many men he was using. "Thirty-two," was his reply. "How many brick do you mold?" "About forty thousand." "Do you keep your mark up to that number?" That was a poser. "Well," he said, "I keep my men at work when I do not mold." He made brick with thirty-two men; his work was behind, and he had to keep his men working when he did not turn out a brick, thereby making the cost on the already manufactured brick double. Where does the cheap point of making brick in this way come in?

—Cut off All Corners.—

In brickmaking the only way is to produce as cheaply as your neighbor. No extra work, no work when not molding, but have men enough to do the work and do it right, is the true method of making brick for profit. The day is past when a foreman has so many men on the yard that they are in each other's way. Such has existed, and I recall a case where the

average number of brick turned out per man during the season was but six hundred. The foreman who was in charge was rated one of the best in the trade, but he carried the thing too far. Such men have caused the graveyard of the brickmaking fraternity to be well filled from financial loss, especially when they have the cheek to carry out their schemes where others can see them. One of the most bare-faced cases of taking advantage of the boss that I ever heard of came under my observation a few years back, and by one, too, who was considered second to none as a foreman. His employer did not understand anything about brickmaking, being engaged in other business, consequently he had what is called a "snap." He had more men by half on the yard than he needed. To keep them employed was hard work, but he succeeded, for he set them to carrying battens and saddles and hack plank from one end of the yard to the other day after day; wheel his brick off the yard before they were fit to set; start three or four arches, and set them up as high as they would stand, probably as high as the closing course, and then set fire in the arch to dry them. Of all such work the proprietor was in blissful ignorance. When the yard had been run about three months the proprietor asked some of the other brickmakers, who made about the same number of brick, the number of men they used. He was told, and that led to a comparison of time, as well as opening the eyes of the boss, and a discharge of the foreman, who never had charge of a yard afterwards.

—The Annual Strike.—

Will it or will it not affect the trade this summer? If it assumes the proportion of a sympathetic strike it will stop all work. What the union may do or the board of walking dele-

building, 435; cost, \$1,621,090. For New York: Number of buildings, 395; cost, \$6,162,045. New York, with less permits, shows nearly four to one in cost of same. Chicago, May, 1896: Permits, 619; cost, \$2,471,485. New York, May, 1896: Permits, 304; cost, \$9,271,885. Quite a difference in value.

—The Market.—

As far as consumption goes, the market is fairly good; as for rates, nothing to brag on. As June is always the month for free shipments, so that July obligations may be met, the market has done fairly well. The manufacturers can thank Providence that it is no worse. What July may do for the trade is yet an untold tale. Continued fair weather would mean freer shipments for room, with a larger surplus lying in New York each day for the buyer to choose from.

Haverstraw	\$4.37½@4.75
Fishkills	4.37½@4.75
Up-rivers	4.25 @4.62½
Hackensack	4.00 @4.37½
South Jersey.....	3.50 @4.25
Pale	1.75 @2.00

A falling off in prices from a shilling to 25 cents per thousand in the month. How long, how long will it last?

A. N. OLDTIMER.

A NEW BRICK REPRESS.

HERE IS no single-mold press upon the market to-day which can compete with this machine in quantity or quality of work. It is built upon improved principles, adopted after the most thoughtful study and the most rigid tests. It is designed and built for either panel brick or fine front brick, as the purchaser may desire. The heavy base is shaped to secure the greatest strength and absolute rigidity. The surface of the crosshead working upon the plunger guide is very large, and the bearing surfaces of both of these pieces are carefully fitted, thus reducing the wear to the minimum. This machine is provided with adjustable device for varying sizes of brick. The feed and delivery of bricks are absolutely automatic and accurate. An oil reservoir is provided which supplies the proper amount of lubricant to the feed table and oil roller. All the gearing and mechanical movements are arranged so as to be free from clay, etc., the lower parts being inclosed in the heavy box frame, but are readily accessible through the large opening in the base. The friction clutch device places the machine under the immediate and instant control of the operator. The pressure exerted by this press is greater to the square inch than in any other machine built, and the quality of the brick will be the best. In capacity it is underrated, as it is considered preferable that it should do more than promised. If you are in the market for a single-mold press you will not regret the purchase of a No. 3. The machine is supplied with friction clutch pulley, 36-inch diameter, 8-inch face; speed, 60 revolutions per minute. Floor space: Length, 7 feet; width, 8 feet; height, 6 feet. Power required, from ½ to 2-horse.

Though this machine has been on the market only about sixty days, a half dozen have already been sold. Several are already in operation and are making good records for themselves. Pages could be written regarding the expectations of new machines, but "doing beats promising," and the letters of the Trenton Fire Clay and Porcelain Company and the Morrison-Trammell Brick Company will tell the story of the new No. 3 power repress. It should be noted that while a capacity of five to six thousand is all that is claimed for this machine, it is running double that number, and giving absolute satisfaction.

—Listen to the Voice of Experience:—

Trenton, N. J., June 21, 1897.

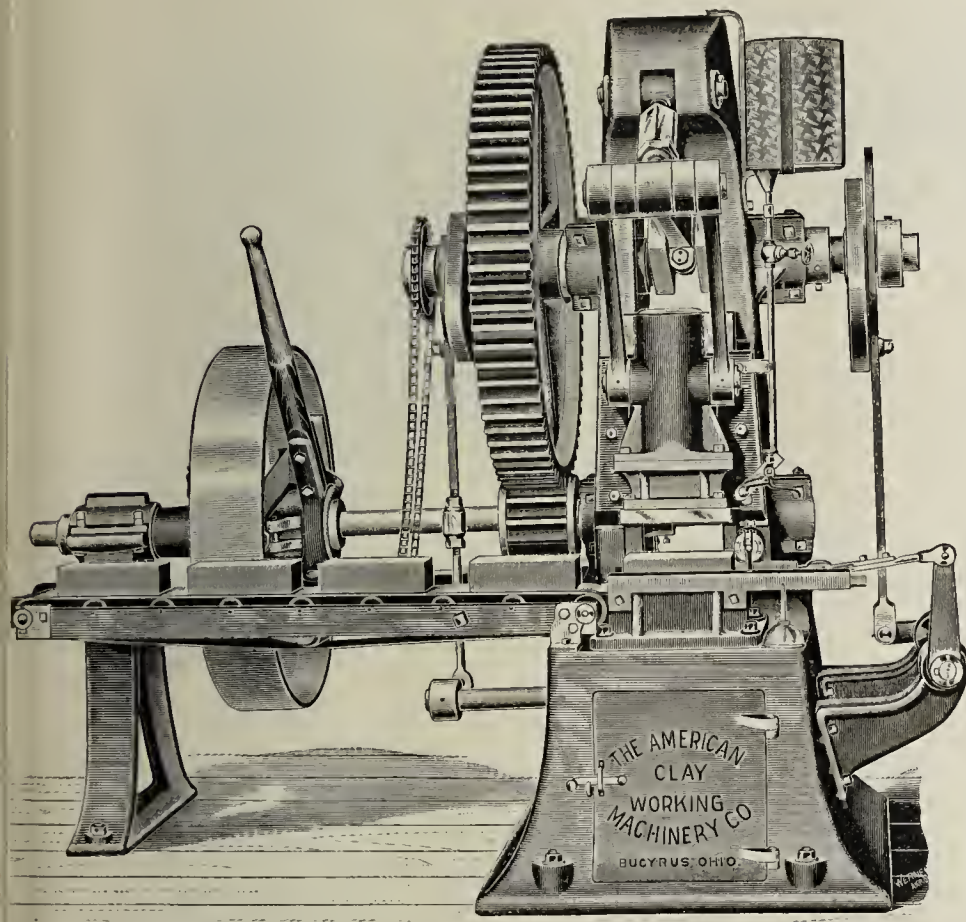
The American Clayworking Machinery Company, Bucyrus, O.:
Gentlemen—In reply to your favor of 18th inst., will say that we are well pleased with the repress brick machine which we recently purchased from you, and up to this time have no cause for complaint. At the speed we are running the machine we press 1,000 brick per hour. We are well satisfied, and can cheerfully recommend same. Yours truly,

TRENTON FIRE AND PORCELAIN COMPANY.

O. O. BOWMAN, President.

Rome, Ga., June 29, 1897.

The American Clayworking Machinery Company, Bucyrus, O.:
Gentlemen—We have been using one of your No. 3 single-mold represses during the present season. It has given such complete satisfaction that we feel this acknowledgment on our part is due you. It feeds, presses and delivers the brick on the offbearing belt with clock-like precision and regulation. We turn out fifteen excellent brick per minute without any special



The American Clay-Working Machinery Co's No. 3 Brick Repress.

gates a few days will develop. What the employers should do is perfectly plain—"shut them out." The Plasterers' Union has made the demand that they appoint their own foreman, and not the boss. There are eighty-three boss plasterers in New York city. When the demand was made five of the bosses acceded to the union, but since then, or last week, they joined the others, and informed the men that they were going to employ non-union men. When one stops to think what that demand means in face of what the law calls for from the employer in regard to the safety of his men, it ought to put such a backbone in the employer that will make him stand firm, and the parties who are having the building erected should release the contractor from his obligation of time finish. The fight has got to come; as well now as later.

—New York and Chicago Compared.—

In the last Clay-Worker the number of permits for buildings in Chicago, with cost, for the month of May, was: Number of

effort. You need not hesitate to guarantee satisfaction to your customers when sending out this machine.

Wishing you success, we are, yours truly,

MORRISON-TRAMMELL BRICK COMPANY.

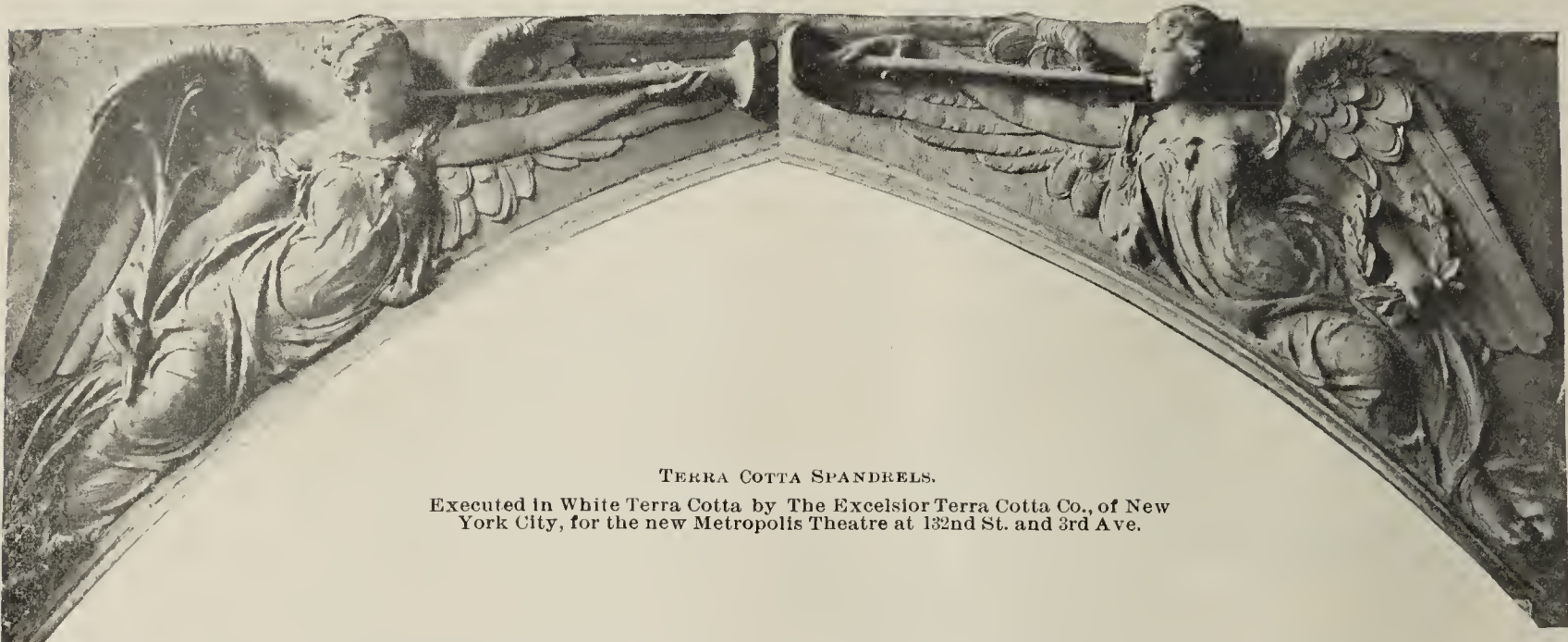
TERRA COTTA—THE MATERIAL GROWS IN USEFULNESS IN THE BUILDER'S HANDS.

TERRA COTTA has been described as the great and only lasting triumph of man over natural productions, for it will last longer than iron, stone, wood and all other materials that will succumb to fire and other destroying influences. Because it predominates in that respect, and because it can be used for the protection of iron and steel and the enrichment of brick work and stone work of various designs, it is used extensively in these days of lofty buildings and artistic and elaborate ornamentation.

The use of the finished product in so many conspicuous structures in prominent cities in the United States is familiar, but it is most generally known that in the immediate vicinity of the American metropolis, New York city, are vast and almost inexhaustible beds of the raw material and extensive works for the process of milling, molding and firing the product. New Jersey has a great variety of clays for terra cotta, the belt underlaid by them extending across the State, with an area of 320 square miles and an average depth of about 350 feet. The

the requisite quantities of same for proper production are usually kept secret in the business, because the proportions have been ascertained after many failures. The combinations of clays and the results of firing have been determined; architects and builders take the product and employ it to the best advantage for interior or exterior work.

Sample blocks of terra cotta are furnished by the makers to the architects, and, after the selection of any particular tint, tons of the material can be produced. From the architect's drawings the draughtsman at the terra cotta works copies the parts which are indicated for the use of terra cotta and develops working drawings for the molders and moldmakers. Some architects furnish their own drawings, with each detail indicated; others suggest what they want, permit the artists and draughtsmen to elaborate the ideas, and approve the results after photographs and blue prints of the models and drawings have been submitted. It is very often the case that the molders have more talent than the architects for producing a decorative effect in terra cotta, because certain limitations must be considered. The draughtsmen also understand by experience how to place the supporting partitions of the hollow pieces. In a few instances architects have indicated large pieces of the material that could not be produced by the present process. It is difficult to make and handle a very large piece from a single design, but almost any design can be repro-



TERRA COTTA SPANDRELS.

Executed in White Terra Cotta by The Excelsior Terra Cotta Co., of New York City, for the new Metropolis Theatre at 132nd St. and 3rd Ave.

belt was the subject of an exhaustive report by Geo. H. Cook, the New Jersey State Geologist, in 1878. At Perth Amboy and Woodbury the bodies of clay have been disclosed extensively. Valuable clays have been disclosed on Long Island, but at present they cannot be marketed cheaply.

Raw material being within reach and the demand for the finished product having increased, capital and brains have developed the process of production, with the result that thousands of tons of terra cotta are carried weekly into New York and Brooklyn. Taking into consideration only the architectural terra cotta the product is immense, and as the process of production is interesting it may be worth while to describe some parts of the industry that have increased rapidly.

Decorative and artistic qualities are employed in the production, and good results cannot be obtained without careful attention, technical skill and exhaustive experiments. The composition of clays and the effect of heat must be known, and the combinations of certain colors must be determined before the plastic mass can be molded and fired. The colors of clays in the pit do not determine the colors of the principal products. A very dark clay may be white after it has been in a kiln, and a red clay may be redder. Some clays cannot be used alone for terra cotta. They require a mixture with other clays and

duced by making the pieces in parts and joining them together. The weight of the clay in a large piece is often too great for its tenacity. During the drying the tenacity should enable the piece to move or travel, as the workmen say, in proportion to the shrinkage. No other material responds to the modeler's touch so readily as plastic clay. The many beautiful designs that are illustrated in the Clay-Worker from time to time evidence its great value as an art product. **ENGARD.**

WORTH THINKING ABOUT.

The motive which prompts advertising is still too often that which prompts speculation. Originally advertising was regarded in much the same light as gambling. To-day it is looked upon more as a business transaction—an investment. It should be handled like other investments—carefully placed, and its results carefully followed up. To the man who looks upon it and treats it as a gambling proposition it will be such, with the odds against him. To the man who treats it as a business proposition it will be an investment, with the chances in his favor.—Advertising Experience.

If your ads. are like angels' visits they are apt to be accorded the same doubtful reception.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

BUTTON-HOLE TALKS.

“LOOK HERE, Gates, what are you after, anyway?” I was lying across a settee right where the last button-holer had left me—lying all limp and frazzled out—when I was accosted as above, and a fresh finger sought the button hole, and, lifting me up against the end of the seat, continued, without waiting for an answer: “After a dollar; honest, now, isn’t that about the size of it? And for the past few years you’ve been a good ways after it—a long way behind it; stern chase is a long chase, and all that, you know. What I want to know, though, is what kind of a dollar have you been chasing? Don’t care a fiddle whether it’s gold, or silver, or paper; that’s all bosh. What I want to know is whether it’s a clean dollar or a dirty dollar; whether it’s a dollar you can show or a dollar you must hide; whether it’s a dollar you can take home and put in the hand of your good little wife, or your sweet little daughter, or whether it’s a dollar that makes you wince whenever you see it or feel it—feels kind of nasty and ugly, and makes you feel just a little bit easier after you have gotten rid of it.

“There are dollars that come, you know, loaded with sunshine, all bright and rich with comfort and good will—honest daylight dollars; dollars that stand for comfort and good cheer to the loved ones at home; dollars that bring little comforts at home; education for the children, pleasant trips, bright rooms, easy chairs; comforts for the old and help for the needy; but these are the honest dollars, the dollars honestly earned.

“Then there are the others, the greasy, slippery, dirty dollars, that belong in the dark, soiled with sin and depravity, wrongfully acquired and ill-odored. Their curse sticks to them, Gates, closer than the dirt, and he who gives them to wife or child gives their curse with them. It may be late in showing, but show it will, sooner or later; seen it a thousand times. Looked all right, seemed all right, and the wife and children to whom these dollars were left often seemed all right, but the curse was there and never could be washed off, but showed up sooner or later, and most generally sooner. It’s a fact that can’t be bribed or bought off. Now, just bear in mind hereafter, if you never have just thought of it that way before, that what you want in your collection are clean dollars, even if you don’t get so many.”

GATES.

Sad Information.

“Art is long and time is fleeting.

And our hearts, though stout and brave,
Still like muffled drums are beating

Funeral marches to the grave.”

—Longfellow.

The above four lines appeared in a penny weekly magazine published in London over forty years ago, called the Family Herald. I had previously familiarized myself with Burns, Byron, Pope, Cowper, Gray, Mrs. Hemans, Eliza Cook, with the first page or so of Young’s “Night Thoughts,” and, perhaps, about the same of Milton’s “Paradise Lost,” but the above was the first morsel of American poetry I ever tasted. I was so charmed with it that I very soon had a small edition of Longfellow on my shelf. Some fifteen years later I came across Artemas Ward’s works. This was my first taste of American

humor. Then I stumbled over Mark Twain’s “Roughing It” and his “Innocents Abroad,” and oh! how I relished these humorists, even in England, where American terms and phraseology were but little understood at that time. When I arrived in this country I found everything on a larger scale than I had anticipated, and soon began to realize more fully the merits of its poetry, humor and general intelligence. It dawned on my mind that Bret Harte was worth reading, and Josh Billings, Bob Burdette, and I confess to being both much amused and instructed by Samantha and Josiah Allen. It would take up too much space to mention the names of the writers of heavy, solid literature; I fairly revel in as many as I am able to read, but there is a saddening reflection will keep breaking in on me. These clever, witty, artistic and scientific fingers that write to please and instruct us keep dying off, one by one, leaving us what they have written, but nothing more to expect from them. I can read of the death of a king, queen, emperor or other high dignitary with stolid indifference, but when one of my authors dies it affects me as a member of my family would. When I read of poor Bill Nye’s death it completely upset me, and I regret him yet. What a unique “History of England” his would have been had he been spared to finish it!

What anxiety it gave me quite recently to read that Mark Twain was hopelessly sick and destitute, and that my favorite composer, Verdi, was also very seriously ill, and what a corresponding relief to my mind to find that both these rumors were false! I lamented the death of Harriet Beecher Stowe, George Eliot (Maria Evans), John Tyndall (very much; his was the sad ending of a bright and useful life), Thackeray, Dickens and a host of others, both American and English, but the last stroke of sorrow and sadness came with the June issue of the Clay-Worker. It fell so suddenly, too! I had no idea that my old friend was ill, for in his last letter (March 15, 1897) he told me he had the grip for about four weeks, but “thanks God he is up again and trying to answer some of his correspondents.” Poor Father Crary! I do sincerely regret his death, and I regret, also, that I had not replied to his last letter to me. I never saw him, nor any of those mentioned above, but I got attached to them all, and mourn the loss of them all. I cannot improve or add much to the splendid tribute paid him in June Clay-Worker, but I would suggest the last article which he wrote be accorded a place in one of the forthcoming Clay-Workers. In one of my letters to him I suggested that he should let politics alone and rest quietly on his oars the remainder of his life, to which he replied: “I may limp on my days as a cripple, but I will not rust out,” etc. And now, “Requiescat in pace.”

WM. WAPLINGTON.

A Tribute to “Father” Crary.

Editor Clay-Worker:

It was with deep regret and sincere sorrow that I saw in your current issue the announcement of the death of our venerable friend, Mr. Crary. I know this feeling will be shared by the thousands of your readers. While opinions on the various methods of operation of our business may, and do, differ (in some cases very materially), we are all combined in the opinion that a man’s worth be recognized and his unselfish efforts appreciated. I do not know of any contributor to the Clay-Worker’s columns who has worked harder or more conscientiously to further the interests of the craft in general than has our departed friend. While his advanced age and the fact of his living so far from our usual camping ground has debarred him from personal attendance at our Conventions, he has always been with us in spirit, as proven by his fatherly letters of regret on those occasions. Any erstwhile difference of opinion must at such a time succumb to the influence of brotherly love and of admiration for noble and generous qualities, so conspicuous in our late friend. By his death the trade in general loses a sound advisor and an able exponent of the general principles of brick manufacture. Beginners in the business or those who had run against one of the many snags that beset the brickmaker’s course all found in him a friend into whose ear

they could whisper their difficulties, certain of receiving all the assistance in his power to render. He lived to a ripe old age, and, now departed, has left behind him footprints—technical, social and moral—that it would pay all of us well to follow.

J. W. CARSON.

The Clay-Worker a Good Investment.

Friend Randall—To give you some idea of my appreciation of the Clay-Worker, will inform you of my recent experience. I saw an ad. in your columns—"For Sale." I replied, received reply from owner, went to St. Louis to see machine, purchased it last week, and it's on my sidetrack to-day, ready to place in position. I know this transaction saved me several hundred dollars, and I got just what I wanted. Do you wonder that I inclose my check for \$2 for renewal of subscription for another year, ending June, 1898? Have been making a great many improvements recently, and as soon as I am through will send you some views of an up-to-date yard, if you care for them. Wishing you and your valuable journal abundant success, I am, sincerely,

Atlanta, Ga.

W. D. PALMER.

The Situation in Chicago—A More Hopeful Outlook.

Editor Clay-Worker:

Evolution is a slow process in business, as well as in nature, and while there are to be seen signs of gain and improvement in the tone of nearly all markets, and in many cases real advances in prices are being made, still, the improvement is not such as to be very marked from month to month. I have noticed some comparisons made as to the relative conditions of the building trade east and west of the Alleghenies, and it has been claimed that in these lines the East is doing better than the West. If this be really the case it can no doubt be accounted for in many ways, and while I do not now care to enumerate or discuss them, I do want to say that from reliable information I am satisfied that no very great differences do actually exist. The West has not as much money as the East, and the evening process, perhaps, for the time, caused a deeper gloom to fall upon the West; but, be it remembered, the West, and Chicago especially, is prone to rise above circumstance and condition, and ere long I expect to see the West again "bloom like the rose," and again to start upon the race for the first place among the cities.

President McKinley has made his promise good, and we have the new tariff bill, as it was understood we should have. In due time we should have a reform in our financial system, as promised, and the return of prosperity, which did begin last fall, will become more and more pronounced as the months go by.

There certainly has been a better feeling the last few days among the dealers in real estate. I am informed there is an increase in the number of inquiries, an increase in the number of sales, and money seems to be coming out of its hiding for investment in realty, and many sales have been made for all cash, purchasers not desiring any time payments.

Loans can be had without any trouble, and for large or small amounts, on any property that has the quality of value in it. Materials for building purposes are cheap as they well can be. Under all these favorable conditions, it would seem that building must increase largely in the near future. July and August are our dull months, as a rule, but indications are that July will show an increase over May or June in building operations.

For four years Chicago, in common with other cities, has had depressing times, but with its increase of 70,000 to 80,000 people each year it cannot much longer be idle and find comfortable quarters for this increase. The excess in building so often spoken of that accumulated to accommodate the World's Fair crowd has been well used up, if it ever existed, and every new structure put up, either dwelling or apartment, seems to be

filled as soon as completed—indeed, leases are made before structures are completed, and as soon as finished are occupied. To be sure, there are some empty ones, but they are mostly old and not in good condition, or are in locations that are not desirable.

The building record for the first half of 1897 shows a decrease over the first half of 1896 of 1,205 buildings and \$3,423,490, and to this decrease must be added about \$2,000,000 for permits taken out for sky-scrapers that will not be started this year, the permits being taken out by holders of property who thought they would build some time and were afraid of being limited by a city ordinance as to height. June, 1896, had permits for 730 buildings, 18,323 feet frontage, \$3,730,295 cost; June, 1897, 436 buildings, 10,877 feet frontage, \$1,886,050; decrease, 1897, 294 buildings, 7,446 feet frontage, \$1,854,245.

Chicago, July 12, 1897.

TEMPERED CLAY.

Prosperity in Georgia.

Editor Clay-Worker:

As all roads lead to Rome, it is not strange that prosperity should arrive here before coming up with ordinary towns. At this time last year there was almost nothing being done in the way of building or improving. Now we have a half dozen buildings in course of construction or being extensively enlarged and improved. The Morrison-Trammell Brick Company are doing their full share of this work, having three large jobs on hand at present.

The Rome Brick Company, besides furnishing their share of brick for local work, are filling an order of four million brick for a large cotton mill at Cordova, Ala., west of Birmingham. They have just filled an order for their "silver gray" brick for the Austell Building, in Atlanta, a ten-story structure. It is the handsomest brick building I have yet seen.

This is usually our dull season, but this year we have been compelled to get along without the expected dullness. Northern Georgia and Alabama have just harvested the finest crop of wheat in ten years. The recent rains will make a fair corn crop, and cotton never fails to get there without regard to rains or drought. Blackberries are so plenty that the colored folks refuse to pick them on the "shares" plan, having rejected my offer to give them half of all they could pick anywhere in Floyd county. There is also a fair prospect for a good yield of "simmons." The promises of the advance agent are being fulfilled here. By the time our cotton harvest begins we look for sure-enough prosperity in every section of the South. I hope soon to hear good reports from our Northern friends, especially from Chicago, where dullness prevails in the building line. I felt rather anxious for my dear old friend Purington, fearing that he might be suffering for the luxuries of life, but feel easy now since he got that "pension." That "wooden-arm" joke on his chirography was rather cruel of Brother Randall. If I were to make a guess at the nature of his disability from his handwriting, I would have said he had lost his eyesight. However, it don't matter what may or may not happen at Chicago during the year; we know that friends Purington and Gates will come up smiling and happy at the Annual Convention. Long may they smile! Can't we all smile together this winter at Pittsburg? I am not unmindful of the cordial invitation from Boston. Indeed, nothing would please me more than to have a Convention at the Hub, and I earnestly hope to "smile" with our brethren there just as soon as business conditions will justify our members generally in journeying to the far East, but think we will have a much larger Convention if we gather this year at some more central point, like the Smoky City. Its central location makes it fully as desirable a point as Buffalo proved to be last year. I, for one, would like to go to the home of the four-year-old, and, if I get a chance, will vote for a Convention at Pittsburg this winter. In anticipation I now feel the warm tingle of a hearty hand-clasp and hear the pleasant voice of Wittmer bidding us welcome. What a splendid Reception Committee Diebert, Cappeau, Koontz and Cawley would make! Come, let us all "smile" at Pittsburg.

R. B. MORRISON.

How Some Islands Were Made and Clay was Formed.

Editor Clay-Worker:

Speaking of cold June weather, there must have been a time, many thousand years ago, when there was a colder June than even this one with which we have struggled—a June of ice crystals in the air, ice mountains moving on the land and in the water, and a perpetually cold day for general business. Neither tariff nor the lack of it would have availed then; the silver dollar and the gold dollar would have been alike worthless. Cuba was not a bone of contention, for it was too cold there for tobacco and bananas, and Hawaii would have frozen out both sugar cane and savage.

It is supposed that the continental outlines were much the same then as now, but as man had not made himself felt in the earth there was little trouble, less meanness and much content. The content was, however, chiefly existent among the seals and other fur-wearing animals, who feared neither arbitrator nor hunter, and the whales, who nursed their calves, unterrified by harpoon and bomb gun.

The active agency in these days seems to have been great masses of ice moving southward, which, in its progress, ground down the rocky summits, in some places filling in the valleys, in others making deeper old water courses, until it reached the ocean, where, if there were not deep water along the shore, the mountains of ice, bearing hard upon the bottom, would here and there push a bit of the soft wash from the mainland out to sea until it could move no further because of the accumulation in front of it, and partly by reason of its own buoyancy, having, in its movement seaward, made a waterway deep enough to float it.

Children often make islands after the same manner, in a small way, when they stand at the edge of a puddle of water, and, with their feet, push a part of the soft mud of the margin out into the water, until it appears above the surface as an island.

Here the mighty agent which had been an irresistible conqueror over thousands of miles of frozen earth lost its power because there was nothing left in its path to oppose it. It drifted into more genial, though enervating, climes, and lost its life in the warm waters of the south, leaving, however, as monuments of its former energy, some of the islands of the sea, such as Nantucket, Martha's Vineyard, the Elizabeth Islands and Block Island, off the New England coast.

The island of Martha's Vineyard has always been a particularly interesting study to geologists because something of its formation can be seen in cross-section in the cliffs at Gay Head. The foundation of the island is clay, in large variety, similar to clays of New Jersey, only somewhat disturbed in stratification because of having been so rudely shoved out to sea. Over the greater part of the island these clays lie too deeply covered by dirt top to be examined or worked, but in the western part of the island, in the towns of Chilmark and Gay Head, there is less covering, and in many places the clay appears upon the surface. At Gay Head the clay was pushed up to a height of 120 feet above the sea level, and the headland, being constantly worn away by heavy seas, presents a precipitous cliff of clay, each stratum giving its distinctive tint, aggregating a most gorgeous scheme in coloring, built up of white, gray, blue, pink, purple, red and black, and a decomposed white granite, which makes the most refractory fire brick in this country, and is being used largely for this purpose.

Every summer thousands of sightseers climb about the cliffs and gather the fossils of ancient sea life; artists paint them in water colors and oil; geologists and manufacturers of clay material examine them in their several interests, and they are the especial summer study of the class in geology at Harvard.

So far the schemes of man for despoiling the cliffs of their beauty by taking away the clays for manufacture have been defeated, chiefly because they are protected by a dangerous coast line. This, of course, while unsatisfactory to the clay-

worker, is pleasing to the majority of visitors, who desire to have the cliffs stand clothed in the beauty which nature gave them.

It has been proposed in government circles to preserve this noble headland by a sea wall. England shows her appreciation of her headlands by spending millions for their protection. We have not yet attained to that degree of care for our coast, and Gay Head is being gradually worn away by the sea.

The only place on the island where the clays are being mined is on a small bay opening into Vineyard Sound, called Menemsha Bight. Here some New York capitalists, working under the name of the Menemsha Clay Company, have purchased a large tract of land, built a wharf out from the sandy shore into the deep water of the Bight, connected it with the hills near by by a horse railroad, and are mining and shipping the same clay and decomposed granite (called by them Menemsha base, which is also used largely in place of grog by brick and sewer pipe manufacturers) found in the cliffs.

Their output goes to manufacturers of fire brick, light colored building brick, terra cotta, stove linings and sewer pipe in New York, New Jersey, Connecticut, Rhode Island, Massachusetts and Maine.

This is a comparatively new enterprise, but as there is an abundance of valuable clay and this decomposed granite on the land adjacent to Menemsha Bight, which offers a safe harbor for shipping, it seems probable that this great deposit which was pushed up from the bottom of the sea away back in the ice age is at last to be made available for the uses of man.

The cliffs will stand to delight his eyes, while the gentler slopes of Menemsha Bight will give up their treasures for his more practical needs.

A NEOPHITE.

Questions for Clayworkers.

Editor Clay-Worker:

Why is it: Hack or hake? Stack of bricks.

Bat or brickbat? Broken brick.

Scove—scoving? Kiln wall.

Lute or loot? Yard scraper.

Kench—kinch? Column of brick.

Spindle or spinnick? Beginning of kiln.

Daubing? Platting or flatting? Salmon brick? Clamp kiln?

Can you tell me from what are these words derived and what they really mean?

R. Brick's Ideas.

Editor Clay-Worker:

In answer to "Questions for Clay-Worker." "Why is it hack or hake, stack of bricks?" I can find no origin for these terms or reason for their use in this connection.

"Bat or brickbat; broken brick." The only reason I can give for this name is that bat was a term given by miners to shale or bituminous shale.

"Scove, scoving; a kiln wall." The only word of this kind is scovel, meaning a mop for sweeping ovens, a "dirty drab."

"Lute or loot; yard scraper." Lute is the proper name and way to spell it. This is taken evidently from this word, which means to close or coat with a paste of clay. It is used to level and smooth the yard.

"Kench or kinch; column of brick." These are terms that I am not familiar with, never having heard them used. They do not appear in my dictionary.

"Spindle or spinnick; beginning a kiln." I have never before had the pleasure of "meeting" these words, and they have no place in my vocabulary.

"Daubing." This means plastering, and needs no explanation.

"Platting or flatting." This refers to the covering of an open kiln; flatting, because this course of brick is laid flatwise on the kiln, the other courses being set on edge.

"Salmon brick." A name given to fish of yellowish red

color, hence this name was given to brick on account of their color, meaning soft or pale red brick; however, the name has lost its significance, as we have hard burned bricks of salmon and every other color now.

"Clamp kiln." The proper definition of clamp kiln is piling green bricks on one another to make their own kiln. This is called clamp instead of kiln. Clamp, in some localities, is used when referring to permanent walls.

We have had an article on brick nomenclature from Mr. Eudaly, I believe. Another on brickyard nomenclature would be in order. The trouble is, a term may mean one thing in one locality and mean something quite different in another locality. Would be pleased to hear from the West, East and North, and some more from the South.

R. BRICK.

Down in Jersey.

Editor Clay-Worker:

During a conversation with M. A. Edgar, the clay miner, we gleaned the following, which goes to show the vast development of the clay mining industries of this county: Mr. Edgar, being a man of indefatigable energy, knowing no such thing as fail, has pushed ahead his mines until now he controls the following, from which he probably ships more clay than any individual miner in the State of New Jersey: What is known as his Perth Amboy bank is situated on the Raritan river, about two miles from its mouth and on the north side, consisting of 150 acres. The Lehigh Valley Railroad runs through the property. There is also a tram road from the bank to Raritan river, where, about two years ago, he erected an extensive dock, where vessels drawing seventeen feet of water can be loaded. The clays from this bank are used for fire brick, stove lining, seggars, retorts and sewer pipe. Capacity about 400 tons per day, under the efficient supervision of Mr. George Liddle. The South river banks are on the South river proper, comprising 200 acres, with four distinct deposits of clay. One deposit, which Mr. Edgar calls his No. 1 universal, consists of a strong, dark colored fire clay, stands a high heat, burns close, and is used largely in fire brick, gas retorts, stove linings and as a mixture in front bricks to hold up weaker clays. In the same property is a deposit of terra cotta, sewer pipe, mottled and paving brick clays. This property is within a few hundred feet of the wharf, where vessels drawing eleven and twelve feet of water can be loaded. These clay beds are connected with the wharf by a tram railroad. On the southerly portion of this property is a deposit of very superior ball clay. The color, when dug, is black. The clay is very plastic, much more so than the ordinary American ball clay, so Mr. Edgar informs me. It is used extensively by the Trenton potters with very satisfactory results. In the same vicinity of the clay just spoken of there is a vein of superior buff terra cotta and front brick clay, from twenty to thirty feet in thickness, that burns a fine buff at a low heat, and is so hard that it is guaranteed not to change color on exposure to the weather. A track from the Raritan River Railroad furnishes extra facilities for shipping by rail, so that Mr. Edgar's customers only have to denote which way they desire their clay shipped, and he does the rest. During the busy season it requires sixty men to handle the product from these mines. Mr. Stevens is the Superintendent of the South river mines, and resides in the town of South River. Mr. Edgar resides in Perth Amboy. He commenced the mining of clay in connection with his father and brother Charles. The latter is the owner of extensive mines in Florida as well as in this county. Mr. E. has been a redhot politician, and has been collector of the port of Perth Amboy and a member of the State Legislature, and when the boys stir him up he can make as admirable a speech as any of them, and when it comes to telling the nature of Jersey clays, why, he is away up in G. Mr. Edgar has just served the county a term as Freeholder, and made a good one. We are now having the road from this city to Metuchen, distance six miles, macadamized, through the efforts of Mr. Edgar while in the Board of Free-

holders, and as this has been, we believe, the very worst road in all christendom for years, the citizens of the county should give him a large vote if he ever asks for it again.

A Good Location for Paving Brick Plant.

Publishers Clay-Worker:

Gentlemen—I have four large deposits of clay on my ranch at the foot of the mountains, all laying close together, one of which I have opened up and taken out about two thousand tons, and it has been used by the Los Angeles Sewer Pipe Company and the California Clay Manufacturing Company, of Los Angeles and this place, in the manufacture of fire brick and terra cotta. The other three deposits have not been opened or developed as yet, as there is no market for the clay, the pipe companies mentioned having their own deposits of clay of that character. I also have a deposit of fire or glass sand, which has been used in a small way by the pipe companies to roll their fire brick in and for parting purposes. Now, then, I think that I have one of the best layouts for a brick plant to be found in this State, and I am of the opinion that there are no vitrified street paving brick made in southern California, and I have the only good quality of fire clay as yet discovered in the southern part of the State. Do you think it would be possible to do anything now, the way times are, in the way of finding and interesting parties in starting in a small way a plant of that kind? Can you give me the name and address of a man who is a trader and rustler, and acquainted in the brick manufacturing line, and could most likely find me a man that would take hold with me? What I want is to correspond with some party who, if he cannot take hold with me, will make an effort to find me a man. I will make it interesting for him.

South Riverside, Cal.

J. H. McKNIGHT.

The Burning Question.

Publishers Clay-Worker:

Gentlemen—I wish to thank you for sending the Clay-Worker so regularly. I am with the English Mining and Manufacturing Company as foreman. We expect to be running our works in two or three weeks. We are putting in a fine line of machinery, furnished by E. M. Freese & Co., and are going to manufacture drain tile, ornamental shapes, fire brick, etc. There is a very fine variety of clay in this vicinity owned by this company. The common clay burns dark red; then we have clay which burns buff, white and pink. We also have the finest of silica and a very fine fire clay, hard and soft.

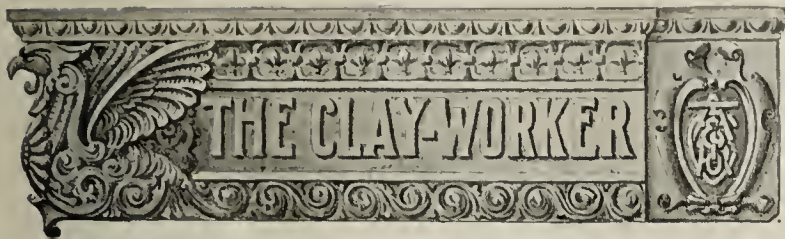
There is one common-brick yard here, and the way they burn their brick seems very strange to me. Their great difficulty is to get the heat to the heads. The brick are all soft, from top to bottom. From the top down there are eight courses soft all over the kiln. The eye brick are soft on one end and black on the other, the only good brick being in the center of the kiln. It does seem to me that if the brick were set more open at the head and corners and the corner fires started first they would have better results. Another thing they do: After they get the watersmoke off, they fire one side six hours and then fire the other side six hours, and so on until the kiln is done. The platting is never touched. I should think that by opening the platting or clogging it you could control the heat to a great extent and have a more uniform kiln. I am not a common brick man, but this is what I think. I notice that almost half the brick are broken, and it takes fifty-five cords to burn 120,000 brick. This must be a very costly way to make brick.

Jackson, Mo.

THOS. PICKERING.

MEASURING BRICK WORK.

To ascertain the number of bricks in a wall, obtain the number of superficial feet and multiply this by 7 for a 4-inch wall, by 14 for a 9-inch wall, by 21 for a 13-inch wall and by 28 for a 17-inch wall. If the wall is thicker than 17 inches, add 7 bricks to every additional 4 inches.—Exchange.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVIII. JULY 1897. No 1.

CURRENT COMMENT.

A glance at our contemporaries leads us to remark that the difference between the Clay-Worker and its followers is that at times the latter are red in spots, while the Clay-Worker is read regularly through and through, from cover to cover, and it's a big difference, too.

* * *

No material change has taken place among the nations of the earth since our last review. Turkey still holds the powers at arm's length, telling them to mind their own business, and Cuba is still in an unsettled condition. Neither apple seems ripe enough yet to drop.

* * *

The event of the month, which has attracted the most world-wide attention, has been the sixtieth anniversary of Queen Victoria's reign. It merited all the attention it received. Few, if any, sovereigns have ever reigned so long over any country, and she has reigned well; that is, she has let the tide of events of the period flow on without obstruction, which is a virtue of no mean degree.

* * *

The price of common building brick in Nicaragua is said to range from \$20 to \$25 a thousand—a brickmaker's paradise, the readers may imagine, but it isn't. The brickmaker gets but about 25 per cent. of the amount named, the balance going for freight and lighterage charges. The brick are shipped by boat from New Orleans and Mobile. The demand is not large, nearly all the buildings there being of wood, only a few boasting of brick piers.

* * *

W. S. Purington, Vice President and General Manager of the Purington Paving Brick Company, Galesburg, Ill., in a recent letter says: "We are very busy at present, and see no indication of a let-up for some time to come. We are shipping five

cars per day to St. Louis, from twenty-five to thirty cars per day to Chicago, and also a few cars to Davenport, Kenosha and other points. On our No. 1 plant we are making blocks 3x4x9 inches, which are giving universal satisfaction wherever used." This sounds like old times. The paving brick plants throughout the country are all in the same happy condition—running full handed and selling all they can make at fair prices. The building brick line will have its inning a little later.

TIMES STILL IMPROVING.

The Clay-Worker notes with great pleasure the continual improvement in all departments of business, all the more wholesome because not by a dash. How much of this is justly attributed to the popular notion that the new tariff is to work wonders we do not care to discuss; the fact that there is general improvement is all we care to notice now. Of course, those whose chief occupation is to find fault with everybody and everything see no improvement, but the fact that in one manufacturing town in New England 14,000 employes are at work during July to fill orders already in, who are usually laid off from four to eight weeks at this season, is encouraging, and there is a general advance in prices all along the line. Wheat, in June, 1896, averaged 54½ cents; in June, 1897, it averaged 68½ cents; corn is 1 cent lower and oats 2¾ cents higher. Almost the only article of commerce that is much lower is silver. A year ago silver was 65 cents an ounce, which was considered phenomenally low, and the low price of country produce was attributed to the low price of silver, but this year silver is only 60½ cents, and still declining, while wheat has advanced 14 cents. Of ninety-eight staple articles, the aggregate increase in price has been from 5 to 8 per cent., dating from the 1st of November, 1896. Times are improving; our own industry partakes of the general advance to an encouraging degree, the most notable advance being in the paving brick line, which is very active.

"IN DEUTSCHLAND."

With this number of the Clay-Worker we conclude the series of papers, "In Deutschland." We are certain that the clayworkers of this country are richer materially, as well as in general knowledge, for these papers having been written. They have been of a practical, technical and commercial character, which gives them great value and interest. The German people have certain qualities which we do not possess. There is a carefulness, a seriousness and a thoroughness in their methods which is not a part of our life and experience. Some of us, in our ignorance, are disposed to call the Germans slow, overconservative, and a little heavy, withal. Is this true? Of late years German cities have developed more rapidly than the cities of America. Several of our cities which, a few years ago, corresponded to certain German cities have been outstripped by the latter. There is no theory or guesswork about this. It is a fact. Considering the character of their soil, they are doing better farming than we are. For years they have had great technical and trade schools, which we are only now beginning to inaugurate. There may be many things which we do better than the Germans. There are certain things they do better than we.

Appreciating this fact, we sent a special representative to Germany for the purpose of obtaining reliable information relative to the methods of work among the clayworkers of that country. Our readers know the result, and, we feel certain, appreciate our enterprise, as well as the ability of our correspondent. The Clay-Worker has never been given to idle boast-

ing. We leave that for our contemporaries, and let the character of our work speak for itself. Those at all familiar with clay literature know full well that within the same period we have contributed more valuable technical matter to clayworkers than have all the other clay papers in the world combined. The record stands for itself, and is a source of reasonable pride from the standpoint of publisher, contributor and reader alike.

THE NEW TARIFF.

By the time this number of the Clay-Worker fairly reaches its readers the new tariff will be in operation. We express no opinion as to its merits in detail. Some of its provisions may be wise, some not so wise, but it is fair to assume that, as a whole, it represents the average sentiment of the American people. There is but one imperative duty now upon every one: Give it a chance by giving it a loyal support as a whole. We may not all agree as to the schedule nor as to the principle which permeates the whole, but we can all agree to give it a fair trial with a hope that it may be a hundred years before there shall be another general shaking up of business by an overhauling of almost every item in the schedule. Experience may show that this article is too low or that too high, but, taking them one at a time or in groups, the wrong may be righted without producing such convulsions as we have passed through in the last few years. Now let us have peace; let us give the new tariff a fair trial, amending it from time to time as its defects may be developed, but let us never have another commercial and industrial revolution by its repeal and the substitution of one radically different. The political capital secured by such a revolution is bought at too much expense, when consequences are counted.

BRAIN POOL.

The voice of the pool and the trust is again heard with loud acclaim. The latest is a sash, door and blind pool. While an article so easily made, and made in so many sections of the country, with such a small expenditure of capital, it would appear a very difficult product to pool. This fact does not affect the pool principle. It may be that in this particular instance new, expensive labor-saving machinery will be introduced which will admit of competition with and annihilation to those who are without the capital which the pool finds it convenient to use. It was so in the glass business, say in the manufacture of fruit jars, for instance. It was formerly thought that a few sheds and a pot furnace or two and crude annealing oven were all that was necessary to the manufacture of fruit jars. This took very little money, relatively speaking. A change came about. The number of these pothouses increased, but one notable concern in this State built a plant for the manufacture of jars which comprised every known labor-saving device—tanks costing from \$20,000 to \$30,000 each; machinery which nailed up a box with a single movement, and all but the top side; automatic machinery which made the tops of zinc, so that two and three-dollar-a-week girls did all of this part of the work. This concern was a pool in itself, not alone in capital, but in knowledge and ingenuity. Immense capital and experience would be required to reproduce the plant. Now the small establishments find themselves in the power of this great concern. There is a suggestion in connection with this in regard to brickmaking. No one affirms, we believe, that in the matter of labor-saving appliances brickmaking has been carried to the limit. While a brick pool does not look feasible in a general way, the building of complete brickmaking plants, embodying every possible labor-saving device, with the use of large sums of money, will

certainly give a dominant influence over large sections of the country. A large proportion of the brick used in this city is made at a point eighty miles distant.

THE GREAT STRIKE.

It is the miners this time. It has been long contemplated, and every precaution that frequent failures have suggested was taken before the strike began. It was humane in the strikers to try their experiment in midsummer instead of midwinter, when the produce of their labor is so indispensable to poor people. The miners have a grievance—no doubt of that—but whether striking is the panacea or not remains to be seen. One result will be higher coal next winter, whether wages are higher or not. The rich will care but little for this, but the poor will feel it seriously. The sympathy of the Clay-Worker is with the laboring man, whether he belongs to a labor organization or not, and whatever uplifts the toiler, whether he be a skilled or an unskilled laborer, interests us and has our hearty support. Evidently a new era in the social and industrial world is upon us in America at least. The period of individual independence is about passed. Once it would have been easy to say to the miners they might try something else if mining did not pay; but what industry is not full? They can no longer go West and locate a quarter section and fish and hunt until odd days devoted to farming developed a home in the wilderness, for they cannot farm now to compete with farmers who use machinery. There are no carpenters, or cabinet-makers, or shoemakers, or blacksmiths, like there used to be. Even our streets are swept with machinery, and the type of the Clay-Worker is manipulated by a machine which has turned out of employment more than two-thirds of the men once needed to do the same work no better.

In view of these new industrial conditions, who has not a grievance? The department store has broken up the small dealers, the big shoe factory has turned the army of shoemakers into mere cobblers, the planing mill and cabinet factories have turned the army of cabinetmakers and carpenters into repairers only, and the man who worked on the street stands leaning on his unused hoe to see the steam sweeper do his work at half what he could afford, and natural gas is rendering coal a nuisance instead of a necessity, and even the mules are out of a job by the introduction of lightning as a motor power, and are on a strike, or about to be. Everything is going to the bad, if high wages and employment are the chief end of life. Just how striking is to afford more than a local and temporary relief it is impossible to conceive. Nevertheless we shall watch its progress with interest, fully convinced, however, that the desired end shall not be reached through striking.

LITERATURE, PAST AND PRESENT.

We are daily brought anew to the realization that there is not only nothing new under the sun, but as well no new way of doing and saying the old things. That mankind refuses to believe this and keeps on trying to find either the new thing or the new way of doing the old thing is one reason he does not relapse into barbarism. We are most unwilling to accept the conclusions of the past; had we not been our financial policy would not have been in its present chaotic condition and our baseball clubs would have been in the healthy, permanent condition of the Olympic games of ancient Greece. We pride ourselves on our nineteenth century wisdom and skill, and then discover that the ancients did the same things as we, and did them well.

Let us grant that we of this century are less barbarous in

our methods; our art of war is more refined in its cruelty, our social system less openly vicious, our decorative arts less gaudy in their splendor; but the subtleness we have added is about all—always barring the interpretations of life that science is constantly adding. Science may one day regenerate the world, both materially and spiritually. Who can say nay?

When we enter a great public library of the latter part of the nineteenth century, with its interminable records of the past, its poetic insight into the future, its records of scientific attainment, its alluring pages of romance, which for the moment turn us from this sordid, work-a-day world, we say the past could not do this. When we see school children, black and white, the weary seamstress, the worn clerk, the student, turn into the doors for help and surcease from daily duties, we are certain that this, at least, is a phase of our later civilization. Yes and no. Yes, in the universality of the benefits conferred. Now any town may have a lending library if it will, for how much more now than in the days of Solomon is there no end "of the making of many books." Books—good books—are both cheap and plenty, and most of us may have them if we will.

ANCIENT BOOKS OF CLAY.

But libraries existed in the very dawn, as we know it, of civilization. Books show us something of the history of the world twelve thousand years ago, six or seven thousand before the civilization of Egypt, as now known to us, was established. And such books as we do not dream of to-day—clumsy, slow of manufacture, but enduring. They are with us now, after a hundred and twenty centuries. Could we do much better, after all?

Not many of these earlier books have been excavated from the sands along the Tigris and Euphrates, but we have whole libraries, whole museums full of the same kind, which come to us from Chaldea thirty centuries before Christ, and from Assyria, too, a century later. They were of thin sheets of clay, upon which in its wet state the curious writing of these early peoples was inscribed with sharp instruments. These sheets of clay were then burned, and the record became fixed against ordinary abuse. All the records of the nation, transactions in business, legal matters, love letters, were thus made permanent. Romances, scientific observations, records of eclipses, etc., come to us through the imperishability of the material used in the manufacture of the books. In Nineveh, in the excavations made in a palace, several large rooms were found in which these books lay piled a foot or more high. This was the lending library of the city. Clay checks were also found, showing records of the use of the books by the inhabitants of the city.

Many of these books do not seem to have been loaned, but were placed on niches along the walls and read in a standing position. These were usually in the form of octagonal tablets. The prisms were from eighteen inches to three feet in height, and contained about as much matter as ten pages of the Clay-Worker. The writing was exceedingly fine, sometimes having to be deciphered with a magnifying glass.

FIRE-PROOF RECORDS.

Great care was taken to prevent the loss, through the defacement of the tablet, of state documents and historical records of importance. The inscription was placed on the tablet; it was burned, and then a second layer of clay was placed over the inscription. This was reproduced exactly on the second layer, and the tablet was again burned. It was not likely that both inscriptions would be destroyed unless through the breaking of the entire tablet. Deeds and other valuable documents were thus treated. Such records had their advantages and disadvantages to the Assyrians. For example, a lovelorn maiden could not well carry one next her heart, nor tie the precious documents with a faded blue ribbon; but, on the other hand, instead of tearing up an offending document with scorn, one could dash it against a wall, and thus get greater relief to the tender feelings than through our present methods.

Writing these tablets was a profession held in great esteem.

The writer sat in some public place, his tablet of wet clay by his side, his small, sharp instrument ready to inscribe what one would pay for. The furnace was near at hand to burn the tablets, although sometimes they were simply sun-dried if the record was not of great value.

Every one knows that we have made very little advance in brick or tilemaking for four or five thousand years. The ancient Chaldeans knew the use of enamel of a very superior quality, and in the ruins of their buildings we find glazed brick, highly and artistically ornamented, which would be a credit to the workmen of to-day. Entire walls were covered with battle scenes, pictures from the life of the people, decorations in honor of the gods, all in enameled brick. It is supposed that the scenes were inscribed on the large mass of clay, then colored, cut to the size and shape wished, and burned. They were next reassembled and placed in position, being held together by very thin cement, in the manufacture of which these people were expert. These brilliantly colored walls, which were used both for the exterior and interior of buildings, must have been very impressive in the warm color of the atmosphere of Chaldea. It was a most unique form of decoration, used by these people alone. It suited their taste, their climate and the material at hand from which to build. It is possible they would not have developed this form of decoration had they had the quantities of stone at their command possessed either by the Egyptians or Greeks. But certain it is that they developed a decoration most beautiful and appropriate, and one which we might study to advantage.

COMMERCIAL ADVANCEMENT.

We must remember that relatively the world is constantly getting smaller. Distance counts for less in the cost of transportation. Less time is consumed in transportation. The markets of the world are coming closer and closer together. The time was when a steamship making a certain trip was able to carry eight hundred tons of freight and twenty-two hundred tons of coal in making the journey. Within recent years improvements have been made so that eight hundred tons of fuel will carry twenty-two hundred tons of freight the same distance. Thus the figures have been reversed, practically. And still the improvement goes on. The result of the construction of improved boilers and engines for steamers is illustrated by the statement that a small cake of coal that will pass through a ring the size of a quarter, when burned under a modern boiler, will result in steam which, when used in a modern engine, will drive a ton of food and its proportion of ship two miles on its way to a foreign port. Another calculator says that a half sheet of note paper will develop sufficient power, when burned in connection with modern machinery, to carry a ton a mile in an Atlantic steamer. These are facts affecting our commercial condition. They are facts to be looked into and examined in connection with the betterment of the business interests of this country. We must recognize competition which comes from sections hitherto unknown to us. We must improve our own methods. We must reduce the cost of manufacture of everything we would sell. It no longer suffices to scratch up the ground, throw in a little seed and let nature take its course. In agriculture, as in manufacture, the highest attainments in chemistry and in science of all kinds must be called into use. Our educational methods must be education not alone in the classics or in literature or history. Our education must be of the practical character—in the process of manufacture and production. We are beginning in the work of the schools for clayworkers. It must continue and enlarge. The literature of clayworking must be classified, and it must go yet further and further into details. New methods, by new men with fresh ideas, must be encouraged and tested. This principle should apply to all manufacturing and agricultural methods. It is a method which, during the last twenty years, has caused the cities of Germany to increase more rapidly in population, to do more building, than the cities of the United

States. It is the method which has enabled them, with a relatively inferior soil, to largely increase the bulk and value of their agricultural products. These are facts which must be considered in connection with our commercial betterment.

QUITE A DIFFERENCE.

In our June issue we mentioned the fact that the Williams Pulverizer and Crusher Company, St. Louis, Mo., were having a very good trade in clay pulverizers, adding as a bit of corroborative detail that "they recently delivered a pulverizer to the Hydraulic Press Brick Company, of their city, making the third machine of the kind they have sold them this season." That is, that is what we intended to say, but by a slip of the typesetter the little word "them" was omitted, changing the meaning of the paragraph very materially. As previously stated, Mr. Williams considers the fact that the Hydraulic Press Brick Company find it to their advantage to use this machine good evidence that it is particularly suited for dry press brick works. For further proof on this score see page 8.

FATHER PIKE SELLS HIS TILE PLANT AND BECOMES A HOOSIER FARMER.

The veteran tilemaker of Illinois, E. M. Pike, of Chenoa, has sold his fine tile factory near that city, taking in trade 1,065 acres of farm land in the corn belt of Indiana. He writes that he has reserved a large stock of tile, and will ship the same to his Hoosier farm, and this winter begin a thorough and extensive system of drainage, by which means he expects to make his farm one of the best in the State. By this deal Mr. Pike will be able to devote more time to pushing the "New Discovery" kiln to the front, where it belongs, for it is one of the best of down-draft kilns. We are glad to welcome Father Pike to Hoosierdom, and trust that his days with us may be many and peaceful. J. C. Houck, of South Bend, Ind., succeeds to the tile business, which has brightened up very materially this season, the prospect being bright for a good fall trade.

REVOCABILITY OF VERBAL PERMIT TO PUT IN DRAIN TILE

The Supreme Court of Appeals of West Virginia holds, in the recent case of Pifer vs. Brown, 27 S. E., Rep. 339, that a verbal license or permit from one lot owner in a town to another to pass a tile drain under the former's lot for the purpose of draining the lot of the latter is revocable at the pleasure of the person giving such license or permit. To entitle a person wishing to drain his lot under the surface of his neighbor's lot by a right not subject to revocation of such neighbor, the court says that the privilege of so doing must be acquired by deed. The reason for this is that the right of drainage through the lands of another is what is called in law an easement, requiring for its enjoyment an interest in such lands which cannot be conferred except by deed or conveyance in writing. The importance of all who have anything to do with such drainage bearing these points in mind is obviously very great. As in this particular case, a person might go to considerable expense in building and putting in tile drains on the strength of a neighbor's verbal authorization to drain through his land, only to have his drains afterwards summarily torn up and be left without any drainage.

BRICK PLANT NOT A NUISANCE IN ITSELF.

According to the recent decision of the Supreme Court of Indiana it cannot be said that a plant for the manufacture of brick and drain tile, or even a gas well sunk to supply fuel for such a plant, is a nuisance in itself. The business is lawful, and, if located in a proper place and conducted and maintained in a proper manner, the court says, neither the plant nor the well can be treated as a nuisance. In the case under consid-

eration, Windfall Manufacturing Company vs. Patterson, 47 N. E., Rep. 2, the company named, in locating its brick and tile works, for which natural gas was to be used as fuel, selected a place retired from all residences, and there erected its plant and machinery at great expense. The business so commenced was continued for three years before the complainants came and erected their dwelling upon land across the highway from the company's land and within two hundred feet of its brick and tile works. Certainly, under such circumstances, unless the works should constitute a nuisance in themselves, or unless they were so conducted as to become a nuisance in themselves, the Supreme Court says that the complainants were not in a position to demand that equity restrain the company in the use of its property. Nor would it make any difference that its gas well was on another side of the brickyard at the time the complainants selected their home on a lot within two hundred feet of the factory. Experience has shown that gas wells are of short life, and that, after the failure of one well, another, in order to be successful, must be located at a considerable distance from the first. Unless, therefore, it should be made to appear that the gas well could not be so managed and maintained as not to be of more than slight or barely possible danger or annoyance to the complainants, it would not seem that they could have any sufficient cause to ask that the sinking of the well be restrained. An injunction will not be granted to prevent supposed or barely possible injuries.

IRON MONEY.

Prof. Raphael-George Levy, of the French Government School of Political Sciences, has written most instructively and entertainingly, in a recent number of the *Revue des Deux Mondes*, in regard to our present financial policy. He shows that no country can shut herself away from the general system of the world, be that system good or bad. He shows that Sparta used iron as money, Egypt and Rome copper; that the nineteenth century has seen the demonetization of silver for the same reason that iron and copper were demonetized: The production of the various metals regulates the place they hold in the monetary system of the world. He says: "Science demands that but one metal become the standard of the world, and the world has selected gold. The countries which have enough gold to transact their commercial affairs are France, England, Germany, Belgium, Switzerland, Holland, Roumania, the Scandinavian royalties, Canada, Venezuela and Australia. Austria and Russia are on the eve of resuming payments in gold. The United States, until now, has maintained gold payments. Chili makes valiant efforts to reach this standard. Europe, therefore, is provided with gold, with the exception of Italy, Greece, Spain and a few principalities. There remains as the true domain of silver India, China and Japan." (Japan has since adopted the gold standard.) M. Levy estimates that the first quarter of the twentieth century will see enough gold to supply the commercial transactions of the world, and that after that money will cease to play so important a part as now in the world, but rather business will be transacted through banks, gold establishing the unit of value. In regard to the free coinage of silver, he says: "Had this come about, the United States would have once more given us a great object lesson, comparable only to that of 1878 and 1893, under the regime of the Bland and Sherman bills. But the experiment this time would not have stopped at the purchase of limited quantities of silver; the productions of the whole world would have flowed into the mints of the United States. How long it would have been before public opinion would have revolted, before the public would have pierced the chimera of the politicians, the future alone could have told. But it is certain that a repeal of such a law would have been more rapid than of the Sherman law of 1893. It would not have remained in force three years."

The philosopher's stone—advertising.

Practical Education,

The Key to Success in Clayworking.

The importance of the clay industries to engineers and architects, great as it now is, is only a faint foreshadowing of the tremendous expansion which is certainly on its way. As our forests are attacked and disappear like the grain before the reaper, so is hastening the day when clay wares and iron will almost completely replace wood as a constructive material. This vast movement, the dawn of which is already at hand, will require a vast army of trained, technically educated men, who can create from this crudest of nature's raw materials those forms of utility and beauty which the wants of civilization and progress will continue to increasingly demand.

Clayworkers and engineers may be interested in knowing that one educational institution recognizes the importance of this hitherto neglected field.

The Department of Clayworking and Ceramics (Established in 1894.)

.... OF THE

OHIO STATE UNIVERSITY

Offers two such courses of study as are now needed in our industrial development:

First—A short, or two-year, industrial course, designed to train practical clayworkers in the application of the commonest sciences to their life work.

Second—A four-year course in ceramic engineering, in which the student is fitted to take a prominent part in the development of this great industry and the upbuilding of its proper recognition among the useful arts.

CAN THE YOUNG CLAYWORKER OF TO-DAY AFFORD TO BEGIN HIS LIFE WORK WITHOUT THIS TRAINING IN THE FUNDAMENTAL PRINCIPLES OF HIS BUSINESS?

If you think not, write for further particulars to

PROF. EDWARD ORTON, Jr.,
—Columbus, Ohio.

Tuition Free.

Expenses Moderate.

Advantages Exceptional.

TABLE OF CONTENTS.

American Architecture In Clay. 11	How Some Islands were Made and Clay was Formed..... 37
Clay Pots for Glassmakers—Solution of a Difficult Problem.. 12	Questions for Clayworkers..... 37
Soft Mud vs. Auger Made Brick 13	R. Brick's Ideas..... 37
The Potter's Art 14	Down in Jersey..... 38
Making Brick by Dry Clay..... 16	A Good Location for Paving Brick Plant..... 38
In Deutschland..... 17	The Burning Question..... 38
The Village Brickyard—Among Clinkers..... 19	Pacific Coast News... 56
Brickmaking for Profit..... 20	A Village Brickyard..... 56
Making Brick for Glory 22	EDITORIAL:
Time's Color Effects..... 23	Current Comment..... 39
The Development of Hollow Block Manufacture..... 23	Times Still Improving 39
Tile Roofs..... 25	"In Deutschland"..... 39
The Equitable Brick Manufacturing Company — A Busy Hive of Workers..... 26	The New Tariff 40
Obituary 27	Brain Pool 40
Brickmaking in Maine..... 28	The Great Strike..... 40
The Clayworking Industries of Victoria, Australia..... 29	Literature, Past and Present..... 40
Akron Items..... 30	Ancient Books of Clay 41
A Brick Company Defeats a Suit for Damages..... 31	Fire-Proof Records..... 41
A Terra Cotta "Talking Bird" ... 31	Commercial Advancement..... 41
The New York Market 32	Quite a Difference..... 50
A New Brick Repress..... 33	Father Pike Sells His Tile Plant and Becomes a Hoosier Farmer 50
Terra Cotta — The Material Grows in Usefulness in the Builder's Hands..... 34	Revocability of Verbal Permit to put in Drain Tile..... 50
Worth Thinking About..... 34	Brick Plant not a Nuisance in Itself 50
CORRESPONDENCE:	Iron Money..... 50
Buttonhole Talks 35	Editorial Notes and Clippings... 54
Sad Information..... 35	MISCELLANY:
A Tribute to "Father" Crary..... 35	Measuring Brick Work..... 38
The Clay-Worker a Good Investment..... 36	A Close Call for Bro. Carson..... 56
The Situation in Chicago — A More Hopeful Outlook..... 36	Brick for South Africa..... 55
Prosperity in Georgia 36	A Wave of Prosperity..... 56
	Press Brick Machinery Wanted 56
	Clays of Indiana..... 57
	Convict Labor for Roads 58
	Things to Do and Not to Do..... 58
	How Much Tile per Acre 58

Index to Advertisements on Next Page.

Books for... Brickmakers.

"CLAY GLAZES AND ENAMELS,"	Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	J. J. W. Billingsley,	1.00
Mailed, postage free, on receipt of price.		

T. A. RANDALL & CO.,
Indianapolis, Ind.

INDEX TO ADVERTISEMENTS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page
Ross-Keller Brick Machine Co...	7	The American Clay-Working Machinery Co.....	76, 81
Simpson Brick Press Co.....	5	The Fernholtz Brick Press Co..	6
The Chisholm, Boyd & White Co.	4		

Brick and Tile Machinery.

Anderson F'dry & Mach. Wks.....	78	The American Clay-Working Machinery Co.....	76, 81
Balrd & Son, H. C.....	64	The Horton Mfg. Co.....	52
Brewer, H. & Co.....	67, 79	The Eastern Machinery Co.....	82
Central Machine Works.....	59	The Henry Martin Brick Mach. Mfg. Co.....	77
Chambers Brothers Co.....	1, 75	The Leader Mfg. Co.....	75
Chicago Brick Machinery Co.....	2	The Ohio Ceramic Engineering Co.....	2
Eagle Iron Works.....	59	The Turner, Vaughn & Taylor Co.....	63
Freese, E. M. & Co.....	80	The Wallace Mfg. Co.....	83
Hensley, J. W.....	61	The Wellington Machine Co.....	55
Kells & Sons.....	64	Williams Patent Crusher and Pulverizer Co.....	8
Meaus & Co., Jas.....	63	Wiles, A. M. & W. H.....	68
Michigan Brick and Tile Machine Co.....	61	Woolley Foundry & Machine Works.....	74
Madden & Co.....	60	Williams, White & Co.....	73
Newell Universal Mill Co.....	74		
Potts & Co., C. & A.....	9		
Raymond & Co., C. W.....	53		
Stedman's Machine Works.....	68		
Steele, J. C., & Son.....	68		

Brick Kilns and Dryers.

Alsip, S. H.....	69	Reppell, L. H.....	69
Conley & Wolfe.....	70	Sharer, Geo. W.....	70
Cummer & Son Co, The F. D.....	57	Swift, F. E.....	62
Eudaly, W. A.....	71	Thaison, A.....	66
Leary, W. A.....	62	The American Blower Co.....	66
Morrison & Co., R. B.....	71	The Fernholtz Brick Press Co...	6
Pike, E. M.....	66	The Standard Dry Kiln Co.....	10
Phillips, S. G.....	67	Wolf Dryer Co.....	84
		Yates, Alfred.....	61

Brick Yard Supplies.

Arnold, D. J. C.....	73	Phillips & McLaren.....	61
Coldewe & Co., G.....	65	The Atlas Bolt & Screw Co.....	60
Carnell, Geo.....	69	The Buck Machine Company...	64
Cox, Geo. S.....	65	The Harrington & King Performing Co.....	3
Caldwell, H. W. & Son Co.....	63	The Keystone Brick-yard Supply Company.....	62
Carmichael, T. W.....	60	The Pittsburg Mineral Screen Company.....	58
Hardin & Church.....	58	Wagoner, M. V. B.....	65
Marlon Steam Shovel Co.....	72	Walworth Run Foundry Co.....	67
Mey, F. H. C.....	58		
Mershon & Co., W. B.....	3		
Newton, A. H.....	65		

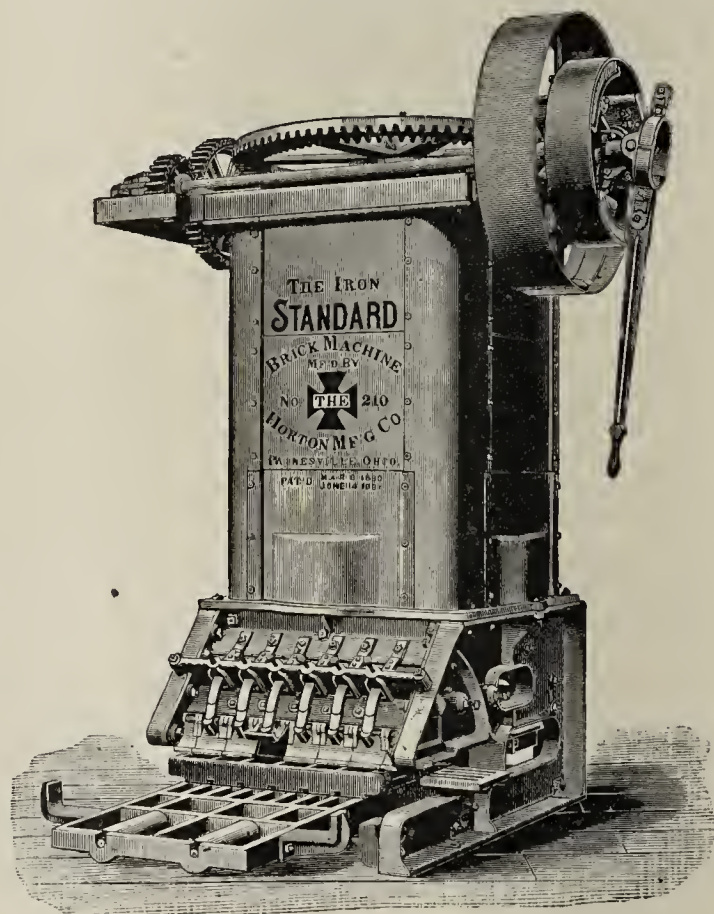
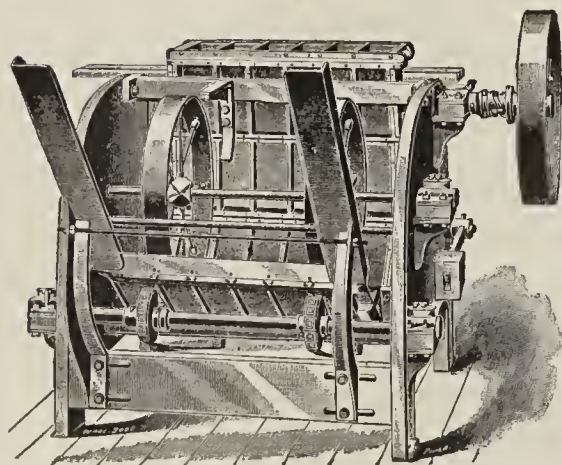
Miscellaneous.

Associated Trade & Industrial Press.....	62	Main Belting Co.....	62
Dean Bros. Steam Pump Works	59	Orton, Prof. Edward.....	51
Dover Fire Brick Co.....	64	Osborne, W. R.....	63
Evens & Howard.....	61	Ropkey-Mason Engraving Co..	69
Hay & Willits Manufacturing Company.....	72	Tennille, A. F.....	64
International Correspondence Schools.....	67	The E. W. Vanduzen Co.....	65
Jackson, John H.....	64	The Unlon Hardware Co.....	65
		The Jeffrey Manufacturing Co...	62
		The Rockwood Mfg. Co.....	65
		Westbrook & Wells.....	64
		Small Ads., Wanted, For Sale, Etc	

Why Not

Buy a **STANDARD** when in need of a Brick Machine. We guarantee them to make as many first-class brick as any machine of its class on the market.

Our Mold Sander is a practical machine and will last for years—do not compare it with those cheap, flimsy machines now offered to the trade.



If in need of supplies or machinery write us before placing your order.

The Horton M'f'g. Co.,

Mention the Clay-Worker

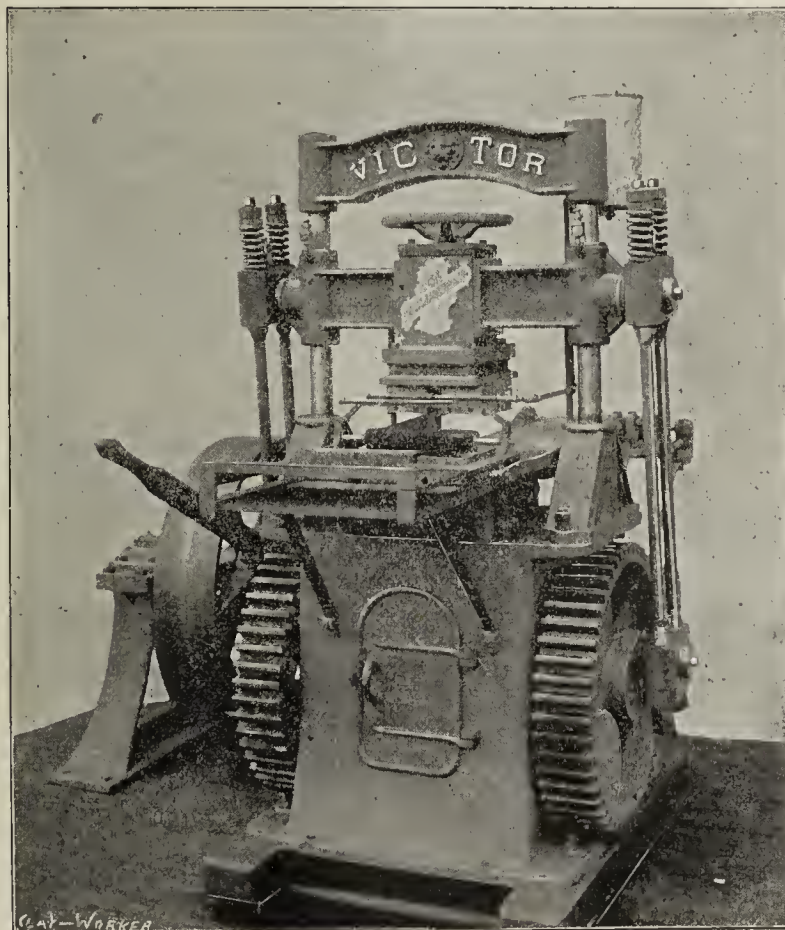
PAINESVILLE, OHIO.

WILL DO ALL THAT ANY OTHER REPRESS
WILL DO AND A WHOLE LOT MORE.

Raymond's New Repress,

The Raymond Victor.

Simplicity
Reduced
to a
Science.



THE RAYMOND VICTOR REPRESS.

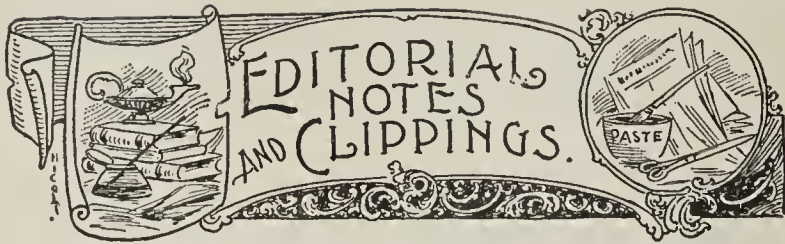
...
C. W. RAYMOND & CO.
DAYTON, OHIO.

PHILADELPHIA OFFICE:
J. A. RIDGWAY, Manager,
Room 508 Mutual Life Building,
Philadelphia, Pa.

PITTSBURGH OFFICE:
H. L. IRWIN, Manager,
Room 1 Jackson Building,
Pittsburgh, Pa.

CHICAGO OFFICE:
B. E. LA DOW, Manager,
Room 406 Chamber of Commerce Building,
Chicago, Ill.

..LOOK AT IT. Isn't it a peach?
Look for cams and springs
and triggers and other instigators
of profanity. You don't see them
because they ain't there. All other
presses have them but the "VIC-
TOR" has not.



Chas. Smith has opened a brickyard at Wytheville, Va.

A large vein of fire clay has been discovered at Tiffin, O.

F. M. Hinson, Arlington, N. C., is in the market for brick machinery.

Nesch & Carr will establish a large brick plant at Leavenworth, Kan.

A. H. Green contemplates putting in a paving brick plant at Oregon, Mo.

R. G. Matthews contemplates putting in a brick plant at Baruesville, Ga.

Mr. R. C. Hamilton, Jeanerette, La., wants to purchase a tempering wheel.

Fred Trowbridge, of Sherman, Tex., contemplates starting a brick plant at Raton, N. M.

Sisson & James have their new brick plant at Bowling Green, Mo., ready for operations.

C. M. Lighter, Newport News, Va., is in the market for a second-hand Chambers brick machine.

Banty, Whippert & Co., write that they are running their tile factory near Defiance, O., full blast.

Miller, McJunkins & Currie have started a brick plant of 20,000 daily capacity at Farmington, N. M.

B. H. Lee is experimenting with clays around Jackson, Minn., with a view of putting in a brick plant.

The Laprairie (Quebec) Brick Company has secured a contract for 500,000 pavers for the city of Montreal.

F. H. Crombe, J. B. Jones and others have formed a company, and will manufacture brick at Atlantic, Ia.

One of the employees of the Steelton (Pa.) Brick Company had a leg fractured by the caving in of a clay bank.

The brick and tile works owned by J. K. Powell, at Bidwell, O., have resumed work, and are running full force.

Wm. Slaughter and Jas. Stafford, of Fortville, Ind., have purchased the brick plant of Wm. Cooper, at Anderson, Ind.

The Webster Fire Brick Company, Portsmouth, O., is running full time, and reports a number of large orders recently.

Jno. Nelson, the Superintendent of Harlow & Agnew's brickyard, at Washington, D. C., died at his home in that city July 1.

Machinery for the manufacture of flower pots has been put in at the fire brick works of Lewin, Thomas & Co., Royer's Ford, Pa.

Baskin Bros. & Reid write that they have started a new plant, with a daily capacity of 15,000 to 20,000 building brick, at Bishopville, S. C.

The Watson Brick Works, at Allegheny, which have been idle for some time, have been started up, and are now running to their full capacity.

The Star Pottery Company's plant, at Tyler, Texas, burned June 29. Mr. J. E. Carlton, the proprietor, estimates the loss at \$3,000. No insurance.

Thomas Hampton, formerly connected with the Standard Pottery Company, Brazil, Ind., will probably start a new pottery at Terre Haute, Ind.

Will Fulrath expects to make improvements in his brick plant at Savannah, Ill., that will enable him to make paving brick as well as building brick.

That portion of the Monmouth (Ill.) Pottery Works which was destroyed by fire last month is being rebuilt and improvements made in all departments.

Among other improvements being made at A. H. Lupton's brick plant, New Castle, Del., is the building of a new kiln which will have a capacity of 185,000.

The F. D. Cummer & Son Company, Cleveland, O., reports the sale of one of its celebrated driers, to be shipped to St. Petersburg, Russia, and three to Antwerp, Belgium.

A. J. Brooker, for six years Superintendent of the Chicago Hydraulic Pressed Brick Company, at Porter, Ind., has resigned. His place will be filled by E. A. Green.

Early in the morning of June 25 a portion of one of the large buildings at the Sioux City (Ia.) Sewer Pipe Company's plant, which was used for drying brick, collapsed with a crash, causing a damage of \$1,500. Quite a number of employees were

about the building, but fortunately all escaped injury. The wall was built of brick some years ago, and was improperly constructed.

An unusual accident occurred at the brickyard of Jason Densmore, Lebanon, N. H. Pallets on which over 150,000 brick were hacked broke down, ruining the entire lot of brick.

H. F. Townsend, of Avon, Ill., Treasurer of the Illinois Clayworkers' Association, writes that their trade for the season has been quite good, and that he expects it to improve this fall.

The Wolff Drier Company, Chicago, write encouragingly of the business outlook. This means that brickmakers are once more awakening to the importance of economical methods of drying brick.

A severe rainstorm which swept over Rudolph, Wis., recently, damaged 200,000 dry pressed brick ready for the kiln at the yard of Jno. M. Lessig & Son. Mr. Lessig estimates his loss at \$1,000.

W. W. Woolley, of Anderson, Ind., is reported to have purchased the works of the Anderson Brick Company, which were lately put in the hands of a receiver. He assumes all its obligations and will put the plant in operation.

The Athens (O.) Brick Plant has closed down on account of a scarcity of coal, brought about by the strike of the coal miners. The Industrial Brick Company's plant, at May's Landing, N. J., is closed down from the same cause.

Four hundred cords of wood that had been cut during the winter and piled up ready to haul to the brickyard of Richard Murray, Berlin, Conn., was set fire by mischievous boys and burned to the last stick. The loss is about \$1,000.

A fire was discovered at the brick plant of J. M. Leach & Co., near Kokomo, Ind., but was extinguished by the workmen, with the aid of chemicals. One of the workmen had his hands severely blistered and another was overcome by the heat. The loss is estimated at \$300.

Montague & Co., Chattanooga, Tenn., report trade as flourishing. Since the first of the year their business has very largely increased, and the demands for their product are greater than ever before. They are running full handed, and say they regard the business outlook as very encouraging.

Geo. W. Monroe, of Elizabethtown, Ill., writes that he intends to start a brickyard at Canton, Miss. He says: "I think I will have a good chance there. There is no boom on, but enough work to keep a small yard busy. I have read the Clay-Worker now for a number of years, and think no brickmaker should be without it."

Trade is booming with the potteries at East Liverpool, O. As a rule, from one to three weeks has been the average mid-summer shut-down in the potteries. This year that average will be cut in two. The reason for this is the usual drop in trade in the spring did not come. Their stocks are now low, and a big fall trade is anticipated.

Jno. Dwyer, a prominent brick manufacturer of Kansas City, Mo., was struck on the head by a falling plank at the brickyard several weeks ago. The blow burst a blood vessel and left his mind almost a blank, and Sunday, June 20, he died. Mr. Dwyer was fifty-six years old, and had been engaged in the brick business for many years.

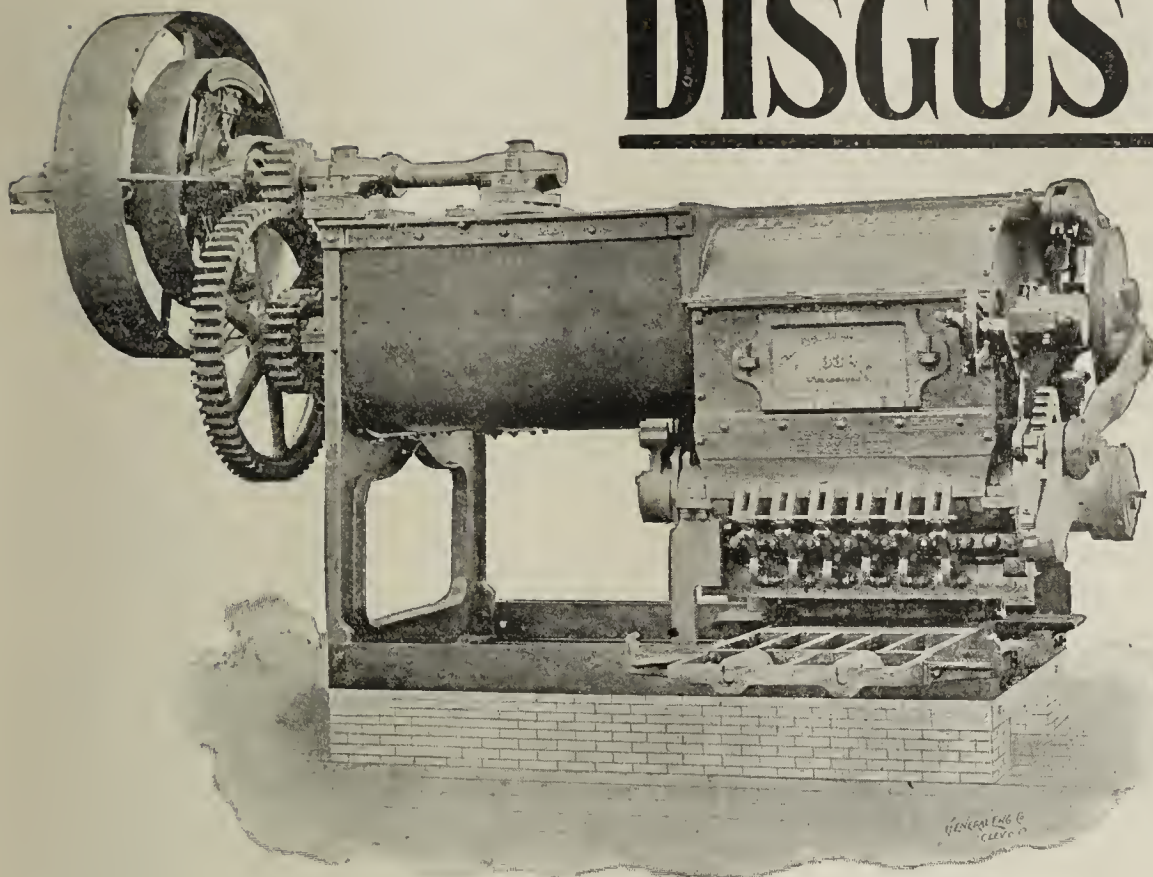
Patrick Hartt, a prosperous brick manufacturer, of No. 357 Bedford avenue, Brooklyn, N. Y., died at his home at midnight, June 18, from the effects of some poisonous substance, arsenical in its nature, which was in some coffee he drank, and by which his entire family was also threatened with death. The authorities have taken the matter in charge and will endeavor to solve the mystery.

Considerable comment was caused recently by the placing of a \$50,000 mortgage on the works of the Marion (Ind.) Brick Company. The money was not needed for the Marion plant, which is one of the most prosperous in the State, but will be invested in a new and extensive plant to be operated by the same company near Montezuma, Ind., where they have extensive clay deposits.

Thomas Robinson, of Robinson Bros. & Co., sewer pipe manufacturers, Akron, O., and the Akron Fire Clay Company, Canal Dover, O., died at his home in Akron June 30. Mr. Robinson was sixty-one years old, and had been actively engaged in the clayworking industry since 1857, having been connected with the Whitmore-Robinson Company, of East Akron, for the last forty years.

Mr. M. W. Brooker, Manager of the Hydraulic Pressed Brick Company, Findlay, O., has purchased the pressed brick works at North Baltimore, and, after making quite a number of repairs and needed improvements, will put it in operation. Mr. Brooker has tendered his resignation, which will take effect July 1. He will be succeeded by Mr. C. H. Thorndyke, who is at present bookkeeper for the company.

DISGUSTED



And wanting to kick themselves, have been several parties lately who bought machines, sanders, moulds or other supplies without getting OUR prices when they learned what they were.

Don't You Do It.

We don't claim to be "the only pebbles on the beach," but as we are one of the FEW firms who have been **LEADERS** (in every sense) for nearly a generation,—

Common sense will surely prompt you to know what we can do

NOW.

Prices on some goods were never so low.

The "Monarch"

Horizontal; with Double Pug Mill and Double Presses, and other valuable features contained in no other.

The "Iron Quaker"

Upright; simplest, best and lowest priced of any real competitor.

These two machines are unquestionably the leaders of their kind.

AUXILLIARY MACHINES AND SUPPLIES.

Pug-Mills, Disintegrators, Crushers, Mould-Sanders, Represses, Winding Drums, Dump Cars, etc., Moulds, Dump Tables, Dryer Cars, Kiln Doors and Castings, Elevators, Dump Carts, etc., etc.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.

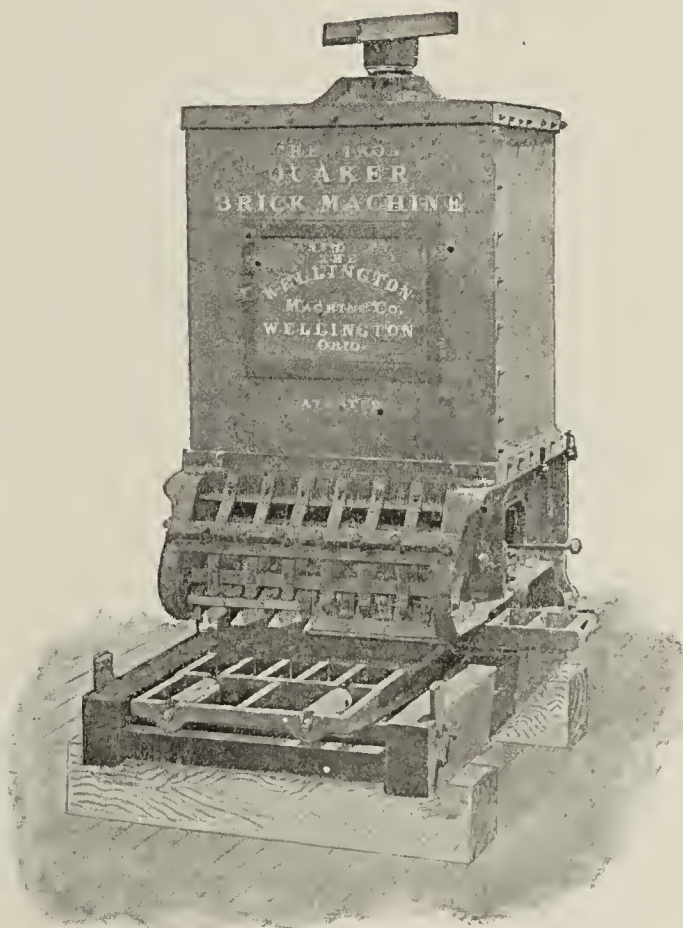
FOR SALE.

Odd sizes of moulds. Have not been used.

5 moulds, $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
20 moulds, $8\frac{1}{2} \times 4 \times 2\frac{1}{2}$. 9-16 in. partitions.
12 moulds $9\frac{1}{4} \times 4\frac{1}{4} \times 2\frac{1}{2}$. $\frac{1}{2}$ inch partitions.

Second-hand, but used a few days only.

10 moulds, $9\frac{1}{2} \times 4 \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
19 moulds, $9\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{1}{2}$. 9-16 in. partitions.
16 moulds $9\frac{1}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
16 moulds $9\frac{1}{4} \times 4\frac{1}{2} \times 2\frac{1}{2}$. 9-16 inch partitions.



The Wellington
Machine Co.,
WELLINGTON,
OHIO.

Send
for
Circular.

PACIFIC COAST NEWS.

THE MANUFACTURERS of clay products are experiencing in this city a very quiet season. The construction of buildings of the important class appears to be few and far between. The position the dealers find themselves in is to simply await the run of the tide which will bring some work and contracts of importance.

James Vanderbeek has found a new brick clay near his brickyard in Virginia, Mont. It makes a very superior article of brick.

Morton & Sons are preparing to burn a kiln of brick on the Krahner ranch, at Placerville, Cal.

The first kiln of brick of the new Denver, B. C., brickyard was burnt recently, and proved quite satisfactory.

The demand for brick for building in Nelson, B. C., has overtaxed the capacity of the Proctor kilns at Balfour, and it is likely that the present capacity will be doubled.

Up to the present time no brick have been burned in Alaska. The Alaska Brick Company has been founded at Juneau, and fires will shortly be put under the first kiln. Experienced men say that a good article of fire clay is found there. A clay deposit found there will be utilized.

A. D. Kitchen, of Lincoln, Neb., who was instrumental in having vitrified brick pavement laid in his town, in speaking of the proper method of laying this pavement, said that it was not necessary to have concrete under bricks, that being only necessary where blocks are laid. The grade of the street should first be obtained, room being left for about four inches of sand and enough more to put the bricks on top of that. The No. 2 paving brick should be laid flat, lengthwise, and rolled with a fifteen-ton roller. After that a cushion of about an inch or an inch and a half of sand should be put on the bricks. After this the bricks should be laid crosswise on the street, breaking the joints. When this is done, the whole street should be rolled with a thirty-ton roller and covered with a little more than an inch of sand. The same method is observed in wet or springy ground as on a hardpan surface, except that in the first case the street is prepared by draining the wet places.

The brickyards in Stafford's addition, on Hangman creek, Washington, report that business has been better during the past two weeks than for a number of years.

Property including the coal mines and clay banks near Elsinore, Cal., has been transferred by the Elsinore Coal Company to the Alberhill Coal and Clay Company.

The brickyards at Pleasanton, Cal., are now running to their fullest capacity.

The Union Brick Company, of Tacoma, Wash., has orders for 1,000,000 brick for the Stampede tunnel of the Northern Pacific Railroad and 1,000,000 for the government buildings at Port Orchard, that State.

Six hundred thousand brick will be burned during the summer at The Dalles, Ore.

M. L. Helsel, of Los Angeles, Cal., has brought an execution on the fixtures and brick in the yard operated last season by R. M. Faulkner for \$137.50. The property is now in the hands of a trustee for Mr. Faulkner's creditors.

Twenty-five thousand bricks are being made daily at the brickyard at the Walla Walla, Wash., penitentiary. A kiln of 250,000 bricks has just been burned.

The Los Angeles, Cal., Terra Cotta and Pressed Brick Company is operating its works to the fullest capacity in the pressed brick department. They have on hand numerous orders from outside places, and are also making brick for the new buildings being put up in that city. The company will furnish from 45,000 to 50,000 brick for the Laughlin Building alone. The press brick capacity of the works is about 8,000 per day. Fire clay crucibles, muffles, scorifying dishes, etc., are also successfully made at the works.

An immense bed of fire clay is located in the Chino, Cal., hills near that town, and experiments are now being conducted

toward putting it to practical use. A lot of bricks have been made from this clay, and are now being burned. The sugar company at that town will use them in one of its large boilers, thus giving them a severe and practical test. A manufactory may be located there, as fire brick are greatly in demand, and most of them used in that section are shipped from St. Louis, Mo., the freight on them being a large item in their cost.

A recent test of the porcelain clay, known as kaolin, found in Riverside, Cal., showed it to be the true thing, also that it carries 30 to 65 per cent. of aluminium.

S. Pierce, of Salinas, Cal., has disposed of his last kiln of 300,000 bricks, and has commenced putting up another kiln of 400,000.

SUNSET.

A VILLAGE BRICKYARD.

Editor Clay-Worker:

Perhaps a few lines from here would be of some interest to you. We finished burning 100,000 brick the 12th of June, but have not sold very many yet. I think we will have a good trade after harvest, as a good many people are talking of building residences and the City Council has decided to put in a water works plant.

We got a good burn on our kiln, but the arch brick are badly checked, which I think was caused by rushing too heavy a heat on to them just after the watersmoke was off. I have been trying to learn the boys to fire with a red heat in the arches for twenty-four hours after the watersmoke is off, but when I came around I found them with their arches chock full of good dry wood and the kiln almost in a settling heat. I have often said that if I could stay on my feet for eight days I wouldn't get out of the way for any one to burn common brick with wood, but, having to trust the kiln with other burners, some one is likely to make a mistake that will damage the kiln to some extent.

We run at 5,000 per day on first kiln and are now running at only 4,000 per day, but as soon as the extreme wet weather ceases I expect to put on more hands and try to complete 400,000 to 500,000 for the season.

J. H. HORNER.

Astoria, Ill.

A CLOSE CALL FOR BRO. CARSON.

What might have proved a dangerous fire but for their own efficient fire extinguishing apparatus broke out in the kiln sheds of the Laprairie Brick Company, Laprairie, Que. The sheds are separated from the main building by a narrow passage-way (railroad track), consequently it required prompt action to prevent a spread. In less than five minutes after the fire started a strong stream of water was playing, and the fire was confined to the kiln shed. Loss, \$200; covered by insurance.

BRICK FOR SOUTH AFRICA.

The Union Brick Works, of Tacoma, Wash., recently shipped 200,000 building brick to South Africa. It is a new venture in that quarter, but will probably be followed by many similar shipments, and in all likelihood the South African towns will be built largely of Tacoma brick, for, while it is a long haul, the charges are nominal, the brick going as ballast.

A WAVE OF PROSPERITY.

The Frost Manufacturing Company, Galesburg, Ill., write that they are having a large engine and boiler trade, which, with a fair number of dry pan orders, keeps them running full force. They have figured on more work during the past month than for a long time, and expect to continue busy all summer.

PRESS BRICK MACHINERY WANTED.

E. McEachern & Mathews, of Banks, Ala., write that they are looking for the best machinery for making pressed brick, and will be pleased to receive catalogues of prices for a moderate cost plant.

CLAYS OF INDIANA.

We are indebted to State Geologist Blatchley for a copy of his annual report, which makes a large and substantial volume, containing a vast amount of valuable information relative to the mineral and other natural resources of Indiana. Considerable space is devoted to the clays of the State, Mr. Blatchley having given much time to this branch of his work.

Indiana is very rich in clay deposits. Mr. Blatchley calls attention to the fact that the disappearance of the forests and the consequent rapid advancement in the price of different kinds of lumber have led builders to investigate more carefully the value of clay products for structural purposes. He expresses the belief that all present signs point to clay, that most widely distributed and cheapest resource known on earth, as the leading factor in the future structures built by man.

—Paving Brick Clay Deposits.—

Millions of tons of shales and underclays well fitted for making the best grades of paving brick exist in the coal-bearing counties of Indiana. These clays lie in the closest proximity to the fuel necessary to burn them; yet previous to 1896, of the \$884,667 expended by twenty-seven towns and cities (not including Indianapolis) of the State for paving brick, no less than \$647,022 was sent to Ohio and West Virginia for that product. These underclays and shales, he says, can also be made into the best of sewer pipe, roofing tile, terra cotta, hollow brick, pumps, pressed front brick, etc. A number of large factories have recently been erected. He takes it that these factories are but the forerunners of many yet to come, for the raw material is there, the fuel necessary to burn it is there, railway facilities for bearing away the finished product are plentiful, and, where these necessary elements are present, capital, in time, is sure to come, and to make this section of the State a great clay industrial center.

"The people of Indiana," the report says, "with hundreds

of thousands of dollars of capital lying idle, are for the most part reluctant to invest in the resources of their State. They stand by and see our thickest coal veins, our greatest clay factories, our largest stone quarries, the majority of our oil wells and the greater part of our natural gas properly owned and operated by foreign capital."

It is suggested that in the clay industry especially Indiana capital should be invested, and the several millions of dollars now annually sent out of the State for clay products be kept within her bounds.

SYSTEM OF DOWN-DRAFT AND CONTINUOUS KILN for the firing of ceramic wares, and especially for hard porcelain; patented in France by M. Theodore Haviland; reported by *Moniteur de la Ceramique*, Dec. 1, 1896.

Kilns for firing porcelain have never been economical of heat or fuel, and in applying to this kind of firing the principles of systems like the Hoffmann kiln, etc., potters have not been able to obtain white and translucent porcelains. By combining the down-draft and the continuous systems M. Haviland has obtained a kiln for firing hard porcelain that is economical, by utilizing the heated gases from one kiln in another and by recovering the heat units formerly lost, which have been about 60 per cent. of the whole.

The inflammable gases, on leaving the first kiln, after having followed the usual course in the down-draft kiln, are caused by the special form of kiln-floor tiles to enter conduits, which then conduct them into the second kiln through its irregular (broken joint) lining, into which the gases penetrate through openings ad hoc, and so distribute uniformly the heat of the second kiln. In order to recover the heat thrown off in cooling a kiln of ware, and to utilize the heat of the mass of products and of the masonry of the kiln, which has hitherto been lost in the firing of porcelains, the heat thrown off during the cooling is conducted into the second furnace, when the fire has just been kindled, by opening certain openings through the floor tiles and by closing others. This heated air then passes through the fuel placed in the fire bags of the second furnace and causes a more active, complete and perfect combustion.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker



Read What

H. C. Carroll & Sons. of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE, 60TH AND HAVERFORD STS.

TELEPHONE 147, W. P.

H. C. CARROLL & SONS, Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS: { 57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell your troubles to"

The F. D. CUMMER & SON CO., Cleveland, Ohio.

CONVICT LABOR FOR ROADS.

It has often been suggested that the penitentiary convicts in Illinois could be employed in building permanent highways. General Stone, at Burlington, the other evening, made a good suggestion as to how this can be done. On a visit to California two years ago he was asked to suggest a plan for the betterment of the roads of that State. He found that at or near the State prison was a fine quarry of trap rock. The convicts had been quarrying building stone for the State institutions, but that work was now over, and eight hundred idle men were in the institution. By his suggestion a law was passed and these men were set to quarrying and crushing the stone, the latter operation being done by machinery, as much cheaper than hand work. Now the convicts are furnishing road-making material for all parts of the State, and paying for the maintenance of the prison besides. The stone is sold for 25 cents a ton, loaded on the cars, and the railroads haul it at a special rate, so that roads can be built at the rate of 50 to 55 cents a cubic yard at almost any place in the State.—*Monmouth (Ill.) News.*

THINGS TO DO AND NOT TO DO.

An exchange says: Learn to laugh. A good laugh is better than medicine. Learn how to tell a story. A well-told story is welcome at all times. Learn to keep your own troubles to yourself. The world is too busy to care for your ills and sorrows. Learn to stop croaking. If you cannot see any good in the world, keep the bad to yourself. Learn to hide your pains and aches under a pleasant smile. No one cares to hear whether you have the earache, headache or rheumatism. Don't cry. Tears do well enough in novels, but they are out of place in real life. Learn to meet your friends with a smile. The good-humored man or woman is always welcome, but the dyspeptic or hypochondriac is not wanted anywhere, and is a nuisance as well.—*Prairie Farmer.*

HOW MUCH TILE PER ACRE?

There are two extremes in tile draining. The beginner is apt to think tile drains are only needed where water stands on the surface in hollows and has to be drawn off. But when this is done it leaves the soil in these hollows so much drier and better fitted for cropping that the farmer sees that even the uplands, that had been supposed dry enough, need draining also. Usually the first drains are put in too shallow. That, if continued, means a large, useless expenditure for tile. Nowhere should underdrains be dug less than three feet deep. They will then drain perfectly two to two and a half rods on each side

of the underdrain. The soil will hold so much more water with a deep drain that it will not require larger size than will a shallow one.—*American Cultivator.*

Mention the Clay-Worker

When writing to Advertisers

Mention the Clay-Worker

INDIANA, DECATUR & WESTERN RAILWAY COMPANY—\$1 EXCURSION TO DECATUR.

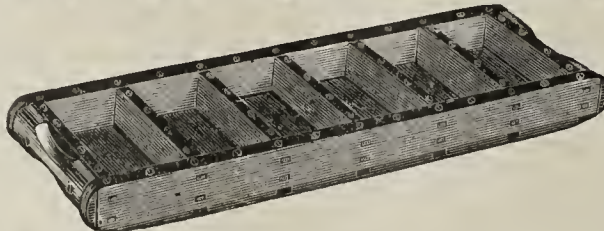
On Sunday, July 25, 1897, the Indiana, Decatur & Western Railway will run a special fast excursion train to Decatur and return. Fare for the round trip one dollar (\$1). Special train will leave Union Station, Indianapolis, 7:00 a. m., arriving at Decatur at 11:50 a. m. Returning, special train will leave Decatur at 6:30 p. m. Tickets good only on special train.

JNO. S. LAZARUS.
General Passenger Agent, Indianapolis, Ind.

HARDIN & CHURCH

MANUFACTURERS OF

BRICK MOULDS



Don't fail to get our prices.

Of every kind and description. We make a specialty of Brick moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.
FREEPORT, IND.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

F. H. C. MEY,
Chain Belting Engineering Works,

Approved Appliances for
Elevating, Conveying and Transmission of Power,
64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.



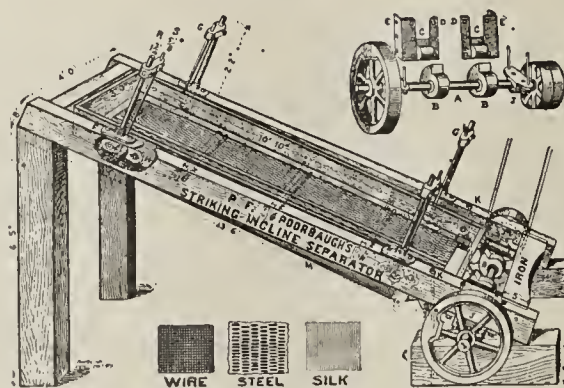
Make
Many More
Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

STRIKING INCLINE SCREEN

For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.



WIRE STEEL SILK

These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the

THE PITTSBURG MINERAL SCREEN CO.

Write for Prices.

PITTSBURG, PA.



Dean Bros. Steam Pump Works, —* INDIANAPOLIS, IND. *

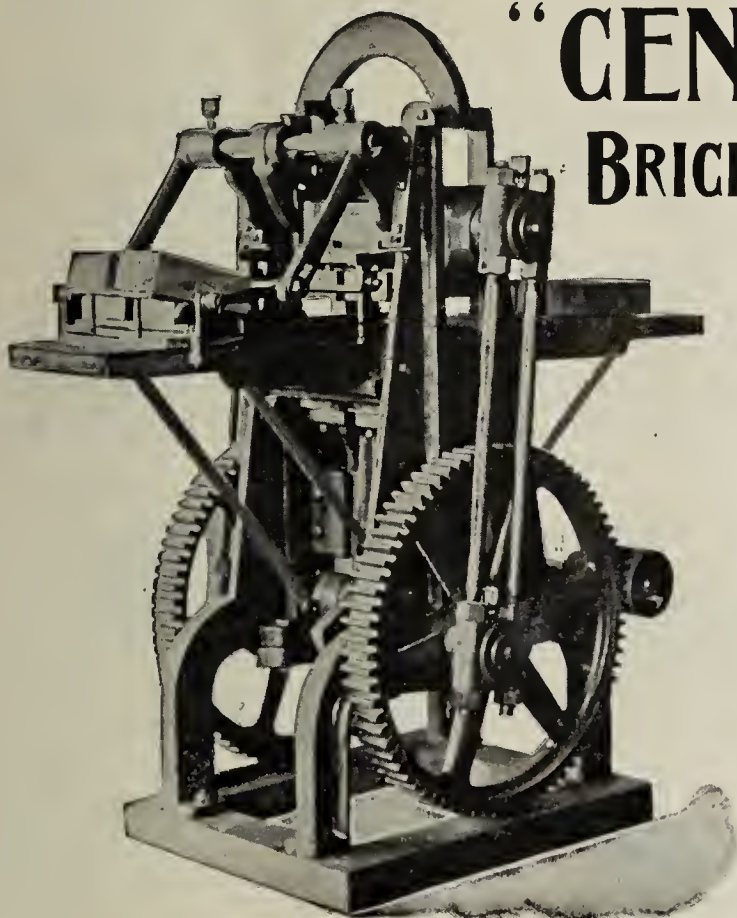
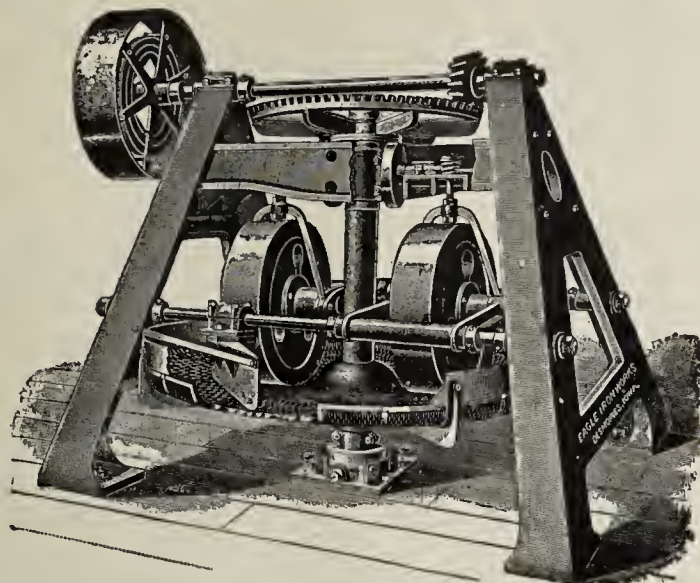
SINGLE & DUPLEX PUMPS.
HORIZONTAL AND VERTICAL PUMPS.
Best Design & Workmanship.
PRICES REDUCED Send for CATALOGUE.

OUR NEW 9 Ft. IRON FRAME DRY PAN

SEND for catalogue and read up on our patented features of this machine. Our motto in its construction and design is

"NOT HOW CHEAP.
BUT HOW GOOD."

EAGLE IRON WORKS, Des Moines, Ia.



"CENTRAL" BRICK REPRESS.

This cut shows our double die machine, which is acknowledged to be the simplest and best repress on the market.

It is no experiment, having been in use over two years with best results. Will do same work as others of twice the size and cost.

For particulars address

**Central
Machine
Works,**

236 Abbey Street,
Cleveland, Ohio.

We furnish all supplies and repairs for any make of the "SWORD" Brick machine.

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cent a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE—Boiler, engine and brick machinery, located in Iowa. For sale very cheap. Address A. J. B., 73 c Care of Clay-Worker.

FOR SALE—75,000 second-hand 34-inch pallets; price, 3 cents each on cars, Buffalo. J. F. STENGEL, 72 2p 928 Ellicott Square, Buffalo, N. Y.

WANTED—5,000 feet 16, 18 or 20-lb. second-hand T rail. Give price, condition and probable cost of loading on cars or boat for Perth Amboy, N. J. Address STANDARD FIRE-PROOFING CO., 71 d Perth Amboy, N. J.

WANTED—Fine line of pressed brick to sell on commission in Chicago, along with present line of terra cotta and roofing tile. Have 8 years' acquaintance with architects and contractors. References exchanged. Address ARTHUR POLLAK, 71 d 1122 Marquette Bldg., Chicago.

FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade, including both dry press and auger machines, also continuous kilns using coal and producer gas, and different patterns of down-draft kilns. First-class references. Address

71 d SUPERINTENDENT,
Care Clay-Worker.

RECEIVER'S AUCTION SALE,

At Wellington, O., 10 a. m., July 22, on premises of Hemenway Brick and Tile Company, their complete brick and tile plant, and everything connected with it. Come for bargains. GEO. L. COUCH, 71 d Receiver.

WANTED TO PURCHASE.

1 second-hand one or two-mold semi-dry brick machine of approved make. State maker's name.
1 second-hand revolving screen.
1 clay steamer.
1 hand repress, Cornell make.
Must all be in first-class order and cheap for cash. Address
MARTINE FIRE BRICK AND TILE CO., 71 d Middlesborough, Ky.

FOR SALE.

40 acres of land, with a tile factory, saw-mill, fence machine, four dwellings, with well, gardens, smokehouses and other outdoor buildings. This factory is a large one, four stories high, with two kilns, located nine miles from nearest railroad point, twelve miles east of Fowler, the county-seat of Benton county. This location cannot be beat for making and selling tile in the State; good tile dirt, and plenty of it. Sawmill, saws and fence machine all doing good business. Also, blacksmith shop and tools. A splendid location for store and postoffice, also for feed mill. This location for the above-named industries can't be beaten anywhere. Will sell at a bargain to the man who has the money.

For further information address
L. B. JOSSERAND,
71 d Pleasant Ridge, Ind.

FOR SALE—One complete overgeared 8-foot dry pans, with 48-inch pulley, entirely new. For particulars inquire of
SMITH & CAFFREY,
7 4 dm Syracuse, N. Y.

NO DRY PRESS Brick Plant complete without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer,
6 tf d Wellsburg, W. Va.

FOR SALE OR RENT—A stoneware plant at Sioux City, Ia. Clay convenient and of excellent quality. Good prices. Market practically unlimited. Terms liberal. Address
SIOUX CITY BRICK AND TILE WORKS,
6 3 d Sioux City, Ia.

FOR SALE—At less than half price—One Penfield stock brick machine and pug mill for sand molded brick, with all pulleys, in good order and ready for making brick. Reason for selling: changed to stiff mud. Address
FACE,
5 tf d Care Clay-Worker.

WANTED—Situation as superintendent of a paving or building brick plant. Know how to operate and manage both, and am familiar with all kinds of machinery, driers and kilns. Have had years of experience, and am thoroughly reliable. No bad habits. Address
BOX 88,
6 tf d Care Clay-Worker.

FOR SALE—One second-hand plain slide-valve Steam Engine, 12x24-inch cylinder, with pulley fly-wheel 8 feet in diameter by 17-inch face. Engine complete with governor and stop valve, and by maker of good reputation. We will put in order and place f. o. b. cars Philadelphia for \$300. Address
CHAMBERS BROS.' CO.,
6 2 L Philadelphia, Pa.

FOR SALE CHEAP.

One Boyd 3-mold dry press; one Penfield plunger stiff mud machine, capacity 30,000 per day; one set smooth rolls, 3-inch die; one chain disintegrator. This machinery has been very little used. Inquire of
6 2 c G. H. DOWNING, Kearney, Neb.

FOR SALE, CHEAP.

The St. Joe Brickyard, situated on the Northeastern-Queen & Crescent Railroads, thirty-five miles north of New Orleans. Completely equipped in every respect. Capacity, six million brick per year. Is now in operation. Can be bought for less than one-third original cost. The machinery all in first-class condition. A good money-making plant. Offering for sale because too far to give personal supervision. Address
WM. GARIG,
7 4 10pm Baton Rouge, La.

FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, 1/2 screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
All new or little used, and in excellent condition.
WALNUT,
5 tf d Care Clay-Worker.

REAL BARGAINS IN NEW AND SECOND-HAND MACHINERY.

FOR SALE—A good soft mud brick machine, just as good as new, at the price of an old one; capacity 30,000 to 40,000 a day. Has worked successfully where others failed.

FOR SALE—A second-hand 60-horse-power slide valve engine, rebuilt, and a much better engine than many of the light ones now on the market; good for years of heavy work.

FOR SALE—A small but good tile machine, will make 3 to 8-inch tile or common brick, with 10-horse-power; just the thing for a small factory, and cheap.

FOR SALE—A good, though cheap, second-hand 40-horse-power piston valve engine, in excellent condition; suitable for small tile or brick plant.

MADDEN & CO.,
4 T 3t Rushville, Ind.

BRICK CARS and TRUCKS

Of Any and All Kinds.
Easy Running. Light yet Strong.

Don't fail to get our prices. Catalogue free.

THE ATLAS BOLT & SCREW CO.,
Cleveland, Ohio.

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,

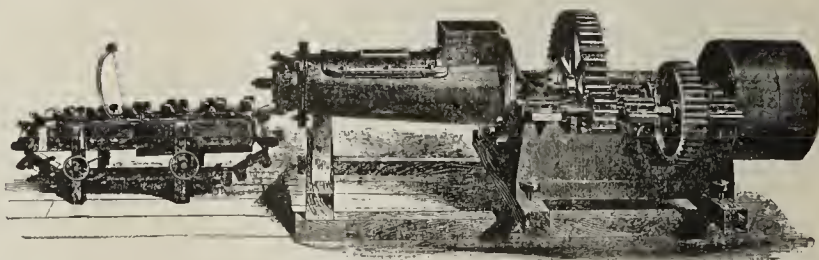
Wellsburg, W. Va.

Nine (9) sold already this Season.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers ... of Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequalled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

....

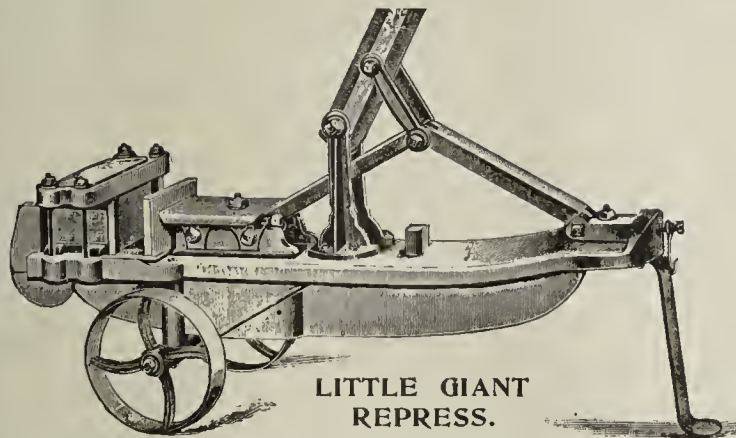
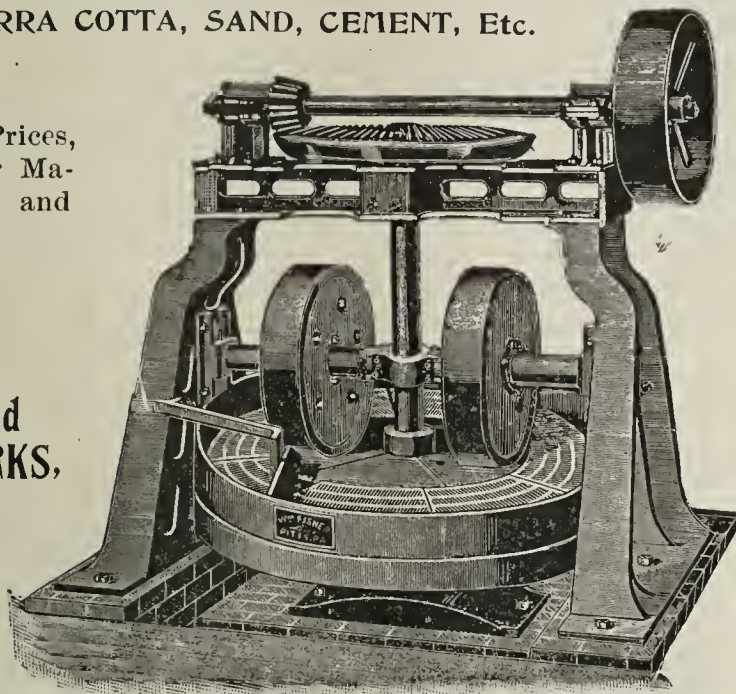
When writing for Prices, state kind of Clay or Material to be ground and capacity required.

....

**FISHER ENGINE
FOUNDRY and
MACHINE WORKS,**

Phillips & McLaren,
Proprietors,

24th and Smallman Sts.,
PITTSBURG, PA.



LITTLE GIANT
REPRESS.

ELI Auger Machine,
Capacity 45,000 to
70,000.

ELI Jr. Auger Machine,
Capacity 30,000 to 40,000.

LITTLE ELI Auger Machine,
Capacity 15,000 to 20,000.

No. 1 A, Auger Machine,
Capacity 25,000 to 35,000.

No. 2 B, Auger Machine,
Capacity 12,000 to 20,000.

THE No. 1 A and No. 2 B Machines furnished with Square Hopper in place of Upright Pug Mill if desired.

DISINTEGRATORS, HORIZONTAL CONVEYORS,

GRANULATORS—SINGLE AND DOUBLE SHAFT,

UP-RIGHT PUG-MILLS, WINDING DRUMS,

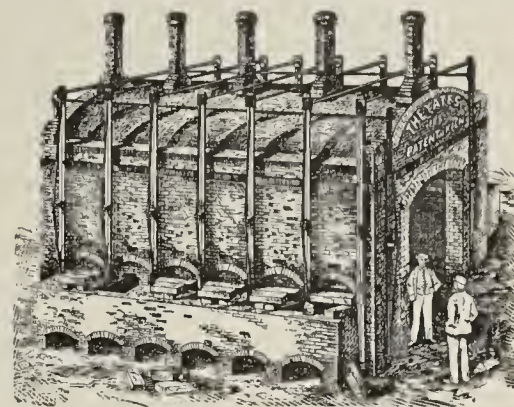
BRICK TILE AND HOLLOW BLOCK TABLES.

TRUCKS, WHEELBARROWS, ETC.

Manufactured and fully warranted by

Michigan Brick and Tile Machine Co.,
MORENCI, MICH.

FOR SALE—Plain slide valve horizontal engine, 40-horse-power, 9-foot fly wheel; 1 Crabtree hand repress; 9,000 soft mud foot pallets, 36 inches long; 1 Potts horizontal brick machine; 1 Potts No. 3 disintegrator; 1 Potts sander, and 1 Newall crusher, 26-inch. All in perfect condition.
HAMBURG VITRIFIED BRICK CO.,
53 c Hamburg, Pa.



**For Economy of Fuel
and Percentage of
Hard Burned
Brick**

This kiln has no equal, I will be glad to tell you all about it.

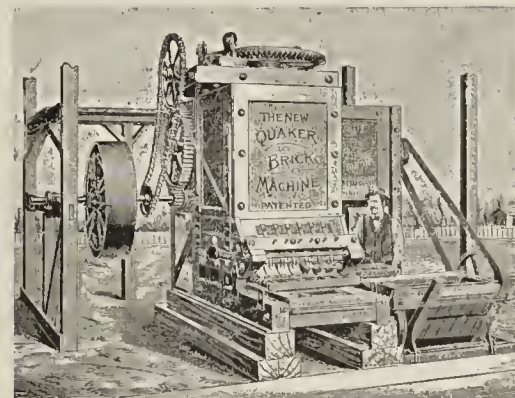
ALFRED YATES,

Johnsonburg, Penn.

Soft Mud Brick Machinery

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sand-



ing Machine, capacity 40,000 or more per day. We carry in stock a full line of first-class brickyard supplies at a very reasonable price.

Send for Catalogue.

James W. Hensley,

General Agent,
Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

Mention the CLAY-WORKER,

When writing to Advertisers

Mention the CLAY-WORKER.

Conveying, Elevating and... Power-Transmitting Machinery.

H. W. CALDWELL & SON CO.

Specialties for Handling
Material of
all Kinds.

GENERAL MACHINISTS,
127, 129, 131, 133 West Washington St.,
CHICAGO.

CALDWELL
Steel Conveyor.

Manufactured exclusively by us at Chicago, with latest
Improvements

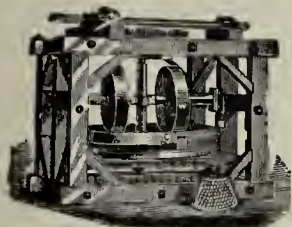
Send for Catalogue.



CALDWELL-AVERY SEAM-
LESS STEEL ELEVATOR
BUCKETS.

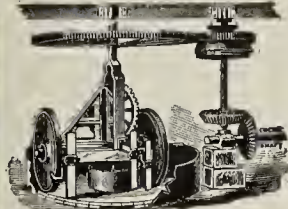
LINK BELTING.
SPROCKET WHEELS.
COTTON BELTING.
RUBBER BELTING.
LEATHER BELTING.
BELT CLAMPS.
ELEVATOR BOLTS.
ELEVATOR BUCKETS.
CONCRETE MIXERS.
FRICTION CLUTCHES.
JAW CLUTCHES.
COUPLINGS.
FLEXIBLE SPOUTS.

GEARING (all kinds.)
ELEVATOR BOOTS.
HANDERS.
PERFORATED METALS.
PILLOW BLOCKS.
IRON PULLEYS.
WOOD PULLEYS.
SHAFTING.
SET COLLARS.
SWIVEL SPOUTS.
TAKE-UP BOXES.
TURN HEAD SPOUTS.
WIRE CLOTH.



Dry Pan.

THE TURNER,



Clay Mill—Harp Pattern.

MANUFACTURES & EXPORTERS OF
VAUGHN & TAYLOR CO.
CLAY WORKING MACHINERY.
OHIO, U.S.A.
WIRE DRAWING MACHINERY.
CHAIN MAKING MACHINERY.
SHODDY AND RUBBER WASHING MACHINERY.



"CUYAHOGA" COMBINATION MILL, NO. 1.

POWER TRANSMITTING MACHINERY.

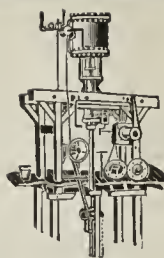
PULLEYS & GEARING.

CRANES
HEAVY CASTINGS
GRAIN CLEANING MACHINERY.
ROPE TRANSMISSION
HOLLOW TUBING MACHINERY.
AND

CONTRACTORS FOR
COMPLETE PLANTS.



Flower Pot Machine.



Vaughn Press—Sewer
Pipe.

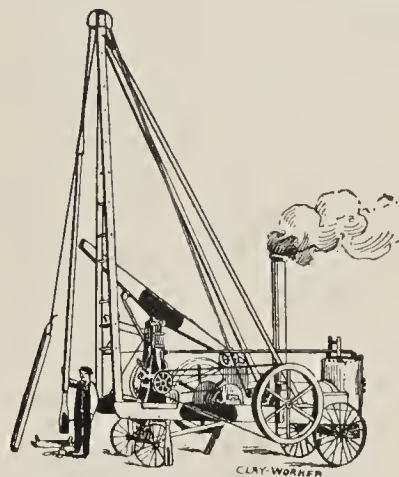
FAST TIME AND THROUGH SERVICE TO SOUTH BEND.

Commencing June 22, through parlor cars will be operated between Indianapolis and South Bend daily, except Sunday, on Big Four train No. 3, leaving Indianapolis at 5 p. m., making immediate connection with Vandalia line fast train at Colfax, which passes through Frankfort, Logansport, Lake Maxinkuckee and Plymouth, arriving at South Bend at 10:45 p. m. G. E. ROCKWELL, D. P. A., for details.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,
PERTH AMBOY, N. J.

Steubenville Foundry & Machine Works,

Established in 1820.

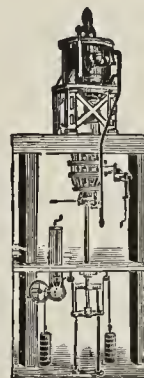
—Manufacturers of—

STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,
Making From 2 to 30-Inch
Pipe Inclusive.

Pipe, Brick, Tile, Coping,
Fire Proofing, and
Building Block Dies.

Clay Grinding and Tempering
Pans and Pug Mills.



FEED
SCREWS

FOR
MINING
CLAY.



STEAM
— ENGINES



Every Variety of Iron and Brass Castings
Shafting and Pulleys.

Send for Circulars and Estimates.

JAS. MEANS & CO.,

Steubenville, Ohio.

COLORIFIC.

For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of

WESTBROOK & WELLS,
Ogdensburg, N. Y.

ALBANY SLIP CLAY.

We have a large bank of a superior quality of SLIP CLAY. Price very low by barrel or carload. Best of reference as to quality. Address

JOHN H. JACKSON,
Successor to JACKSON BROS.,
ALBANY, N. Y.

N. Y. State Drain Tile and Pipe Works.
Established 1852.

A. F. TENNILLE'S

Bureau of

News and Legislative Information,

Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.

Lake Erie & Western R. R.

...ALL RAIL...

Niagara Falls EXCURSION.

Wait for the Old Reliable
Lake Erie & Western

PERSONALLY CONDUCTED

NIAGARA FALLS EXCURSION
Thursday, August 5, 1897,

...ALSO...

Sandusky, Put-In-Bay, Cleveland
and Buffalo, with side trips to

LEWISTON, TORONTO, THOUSAND IS-
LANDS, Etc.

For tickets, rate, time and pamphlet containing general information, call on any ticket agent of the above route, or address

C. F. DALY, Gen. Pass. Agt.,
Indianapolis, Ind.

FIRE

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

GEORGE A. MOSIER,
President.

JAMES A. BUCK,
Vice-Prest. and Gen. Man.

LE ROY VERMILYEA,
Secretary and Treasurer.

The Buck Machine Company,

SOLE MANUFACTURERS OF

Champion Brick Mold Sanding Machines, COHOES, N. Y.

The above Company was duly incorporated on the 8th day of March, 1897, under the laws of the State of New York, with a capital of \$60,000, which has been fully paid in.

This company has acquired by purchase all the interests of J. A. Buck and others in the business of manufacturing Champion Brick Mold Sanding Machines heretofore conducted by him, together with all patents covering said machines.

Of these patents, No. 301,087 is the foundation patent on the feed-rack applied to a cylinder machine. Buck's title to this patent was fully sustained by the decision of the United States Circuit Court of Appeals filed December 8, 1896, which decision was affirmed January 25, 1897, and a motion for a rehearing of the case denied. From this decision there is no appeal, and the title to this patent cannot be disturbed.

Patent No. 499,206 was sustained by Judge Coxe of the United States Circuit Court in a decision filed February 6, 1897, wherein he also sustained Buck's title to said patent. This patent covers the yielding form of feed rack as used in the later Champion Sanders. On February 15, 1897, a decree of the Court was entered granting and injunction against the use of infringing machines.

A copy of these decisions will be sent by mail upon request.

Claims against users of infringing machines will be actively prosecuted.

This Company is now prepared to promptly furnish the latest and most approved style of Champion brick mold sanding machines.

These machines are guaranteed in every respect, and purchasers will be fully protected in their use.

No agents should be recognized except those presenting credentials from this Company.

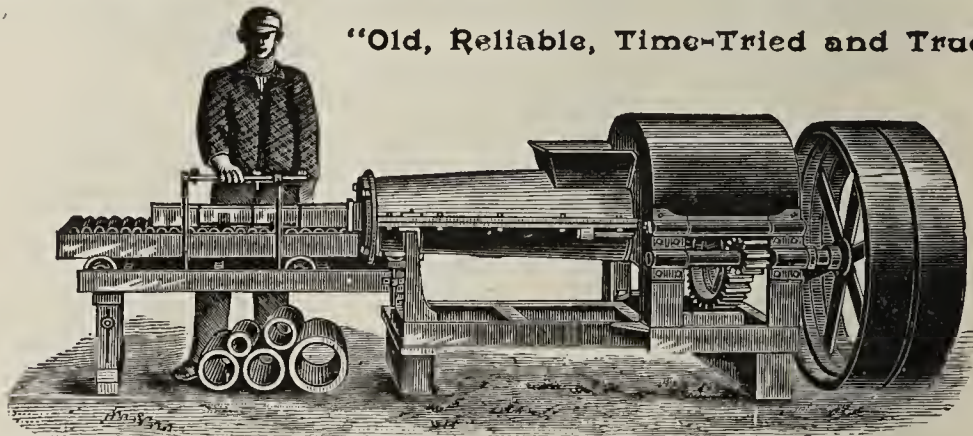
All communications, orders and payments should be made direct to

THE BUCK MACHINE COMPANY, Cohoes, N. Y.

KELLS & SON'S

IMPROVED BRICK AND
... TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

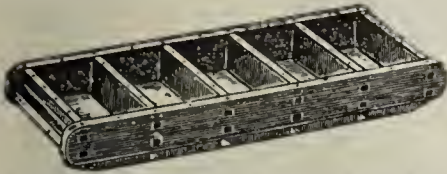
KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON, PARKHILL, ONTARIO,

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the NEW QUAKER BRICK MACHINE.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

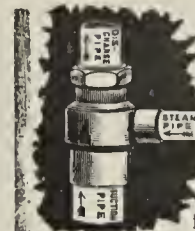


HAND and... MACHINE MOULDS

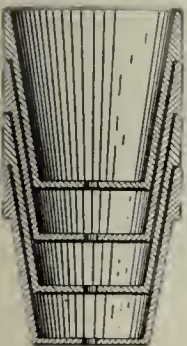
We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



VANDUZEN STEAM PUMP
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
Always in Order, never Clogs nor freezes. Every Pump Guaranteed.
10 SIZES.
200 to 12000 Gallons per Hour.
Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, O.



Make Money WITH THE ONLY SUCCESSFUL Flower Pot Machine (PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

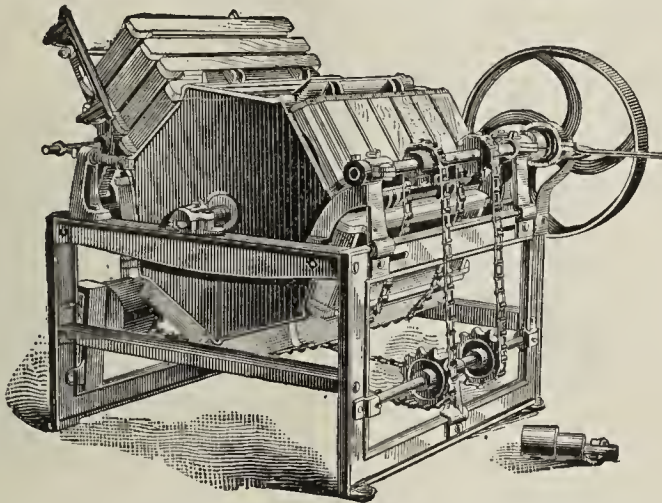


The Rockwood Mfg. Co.,
78 South Pennsylvania St., INDIANAPOLIS, IND.

CHAMPION Brick Mould SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and Serviceable.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, and a suit for that purpose has been commenced against Buck and is now pending in the United States Circuit Court for the Northern District of New York.

Only one patent No. 301,087 was involved in that decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit has been commenced on these patents against Buck, and any persons purchasing from him or his agents will be prosecuted for infringement.

4000 TO 5500 (Gallons of Water per hour.) BY HAND-POWER. Pumps, Hand-power Pumps.

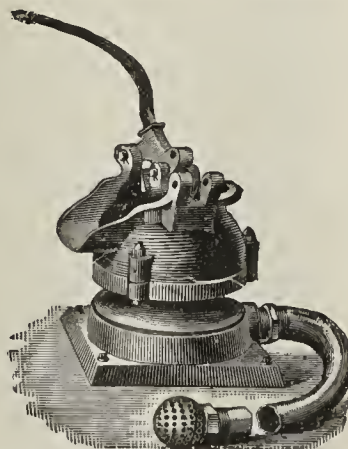
(LOUD'S PATENT.)

These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries or wherever it is desired to raise a large quantity of water by Hand-power. The pump has large valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,
TORRINGTON, CONNECTICUT.



GEO. S. COX'S
Ready Made
Cutting Wires,
Always give Satisfaction.
EAST LIVERPOOL, OHIO.
Send for Samples and Prices.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.
C. B. RYAN,
H. W. FULLER, Ass't Gen'l Pass. Agent.
Gen'l Pass. Agent, CINCINNATI, OHIO
WASHINGTON, D. C.

M. V. B. WAGONER'S
SLIP CLAY { For Glazing of Pottery } WORKS
ESTABLISHED 1845.
Clay in stock in any quantity, in barrels and bulk by the carload.
Office, 20 Ten Broeck St., ALBANY, N. Y.

STOP-LOOK LISTEN
THE POPULAR MONON ROUTE
IS THE BEST LINE TO

CHICAGO
TIME REDUCED TO 4 3/4 HOURS.
FOUR DAILY TRAINS

Leave Indianapolis	{ 7:00 a. m., 11:50 a. m. 3:35 p. m., 12:55 night
Arrive Chicago	{ 12:00 noon, 6:00 p. m. 8:20 p. m., 7:20 a. m.
Trains	{ 3:30 a. m., 7:45 a. m.
Arrive Indianapolis	{ 2:35 p. m., 4:37 p. m.

LATEST IMPROVED
VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant
PARLOR CARS AND DINERS
Local Sleeper in Indianapolis Ready at 8:30 p. m.
Leave Chicago, Returning, at 2:45 a. m.
Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: 2 West Washington St., Union Station and Massachusetts Ave. Depot.
GEO. W. HAYLER, Dist. Pass. Agt.

VANDALIA LINE

The Short Line for

St. LOUIS AND THE WEST.

LEAVE INDIANAPOLIS,	AR. TERRE HAUTE	AR. ST. LOUIS.
* 7:20 am	10:05 am	.....
* 8:10 am	10:15 am	3:15 pm
* 12:40 noon	2:35 pm	7:12 pm
* 7:00 pm	9:04 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am

*Daily.

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46 Jackson Place and Union Station.

W. W. RICHARDSON, Dis. Pass. Agt.

ARE YOU LOOKING**FOR A CHANGE IN LOCATION?**

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS**BEST OF FREIGHT FACILITIES**

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS**MANY KINDS OF RAW MATERIAL**

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns WANTING INDUSTRIES

This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

TAKE THE
BIG 4
TO
St. LOUIS

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in
United States, Canada
and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

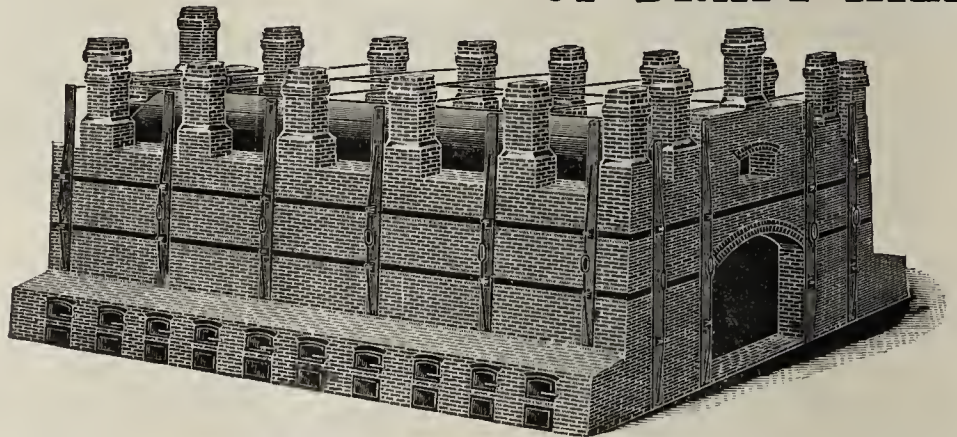
To know more and what users say of it, address,

E. M. PIKE, PatenteeCAPT. G. H. ETTLA, Agt. }
Marietta, Pa.

Chegoa, Ill.



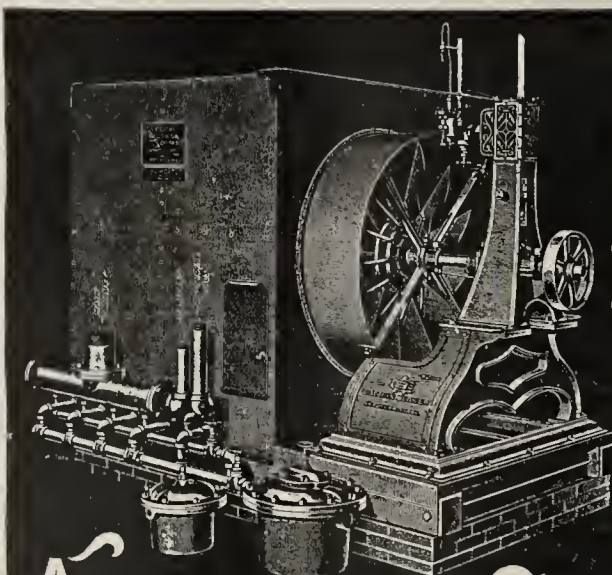
THE THAI SON LATEST IMPROVED COMMON SENSE UP-DRAFT KILN.



Do you make brick? And have you any trouble in burning them? If so, do you want a cheap constructed, simple and durable Kiln? One that will dry any brick without the assistance of Dryer or Fans, and in one-half the time. A Kiln where heat and draft can be changed to any part at will, and burn all hard brick, even and alike throughout, in less time, and with less fuel than any other, no up or down draft Kiln of any kind excepted. This is the Ideal Kiln for Dry Pressed Brick and the best on earth. Sure success with this Kiln. Call and see it at my works or for further information address,

Brick Manufacturer.

A. THAI SON, Laredo, Texas.

**HOT BLAST APPARATUS**

FOR DRYING
BRICK
TILE AND
TERRA COTTA

American Blower Co
SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

SEND FOR CATALOGUE

BRICK CARS

30 Different Styles.

Let us Save You Money.

The
Run
Easy
Kind.

Walworth Run Foundry Co.,
CLEVELAND, OHIO.

THE Best Up-to-Date Brick Dryer.

The PHILLIPS DRYER is THE BEST DRYER because it dries brick Quickly, Safely and Cheaply. By this system there is really no cost for fuel for it saves more fuel than it uses. This may sound queer but it's A PROVEN FACT.

S. G. Phillips, Esq., Rahway, N. J.

SOMERSET, MASS., August 26, 1896.

DEAR SIR—Replying to your inquiry regarding Dryer. We are pleased to say the dryer has now been running five weeks, and so far has given the best of satisfaction, drying our pressed brick for enameling in 10 hours, size of brick (9" x 4 1/2" x 3") without warping or checking.

A vacuum gauge to the exhaust, that heats the dryer, shows our variable cut-off engine to be made condensing, and it is safe and not over-estimated in any point of view to say, the dryer is so far working all right, and costing us no extra power, or firing, as we also do our former work and yet are saving 20 per cent. in our fuel.

We consider the dryer to be doing all if not more than promised, and hope soon to add to our present capacity another two track section.

Yours truly,
SOMERSET & JOHNSONBURG MFG. CO.,
By Warren H. Sanford, Treas.

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

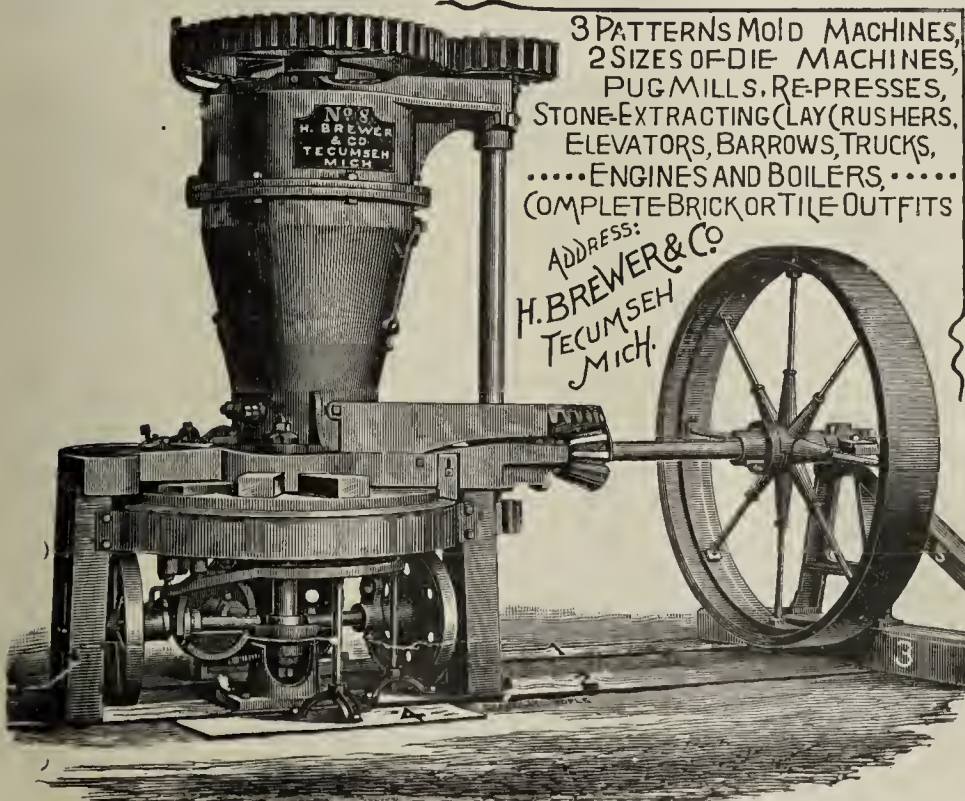
Yours respectfully,
CHAMBERS BROTHERS Co.,
J. H. Chambers, Gen'l Mgr.

S. G. PHILLIPS.

Agent and Patentee,

161 Grand Street.

— Rahway, N. J.



3 PATTERNS MOLD MACHINES,
2 SIZES OF DIE MACHINES,
PUG MILLS, RE-PRESSES,
STONE-EXTRACTING LAY CRUSHERS,
ELEVATORS, BARROWS, TRUCKS,
..... ENGINES AND BOILERS,
COMPLETE BRICK OR TILE OUTFITS

ADDRESS:
H. BREWER & CO.
TECUMSEH
MICH.

ARCHITECTURE

Architectural & Mechanical Drawing; Marine, Stationary and Locomotive Engineering; Sheet Metal Pattern Cutting; Plumbing; Electricity; Railroad, Municipal, & Bridge Engineering; Surveying and Mapping; Book-Keeping; Shorthand; English Branches; Mining; Metal Prospecting; Machine Design. All who study

GUARANTEED SUCCESS.

Fees Moderate, Advance or Installments.

Circular Free: State subject you wish to study.

International Correspondence Schools, Box 958, Scranton, Pa.



Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD and JACKSONVILLE, ILLINOIS.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express.....	8.30 a m
Accommodation.....	3.25 p m
Fast Express.....	11.20 p m

ARRIVE.

Fast Express.....	3.30 a m
Accommodation	10.40 a m
Mail and Express.....	4.50 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



INDIANAPOLIS AND CINCINNATI LINE

6 Trains Daily. Parlor Cars and Cafe Dining Cars on day trains; Pullman, Compartment and Standard Sleeping Cars, and Chair Cars, also Wagner Sleeping and Chair Cars on night trains. Direct Connection made at CINCINNATI without Omnibus and Transfer, for all points

SOUTH
EAST

INDIANAPOLIS, TOLEDO AND DETROIT

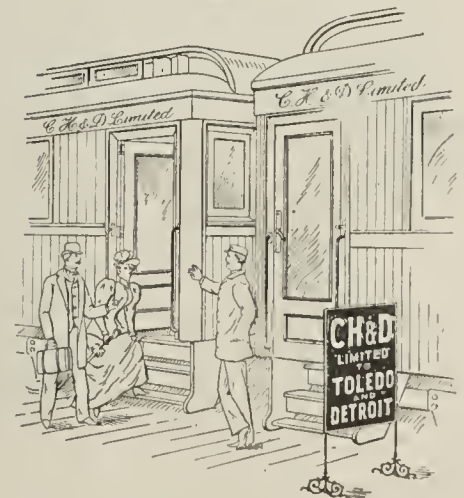
The Michigan Line (via Hamilton.)

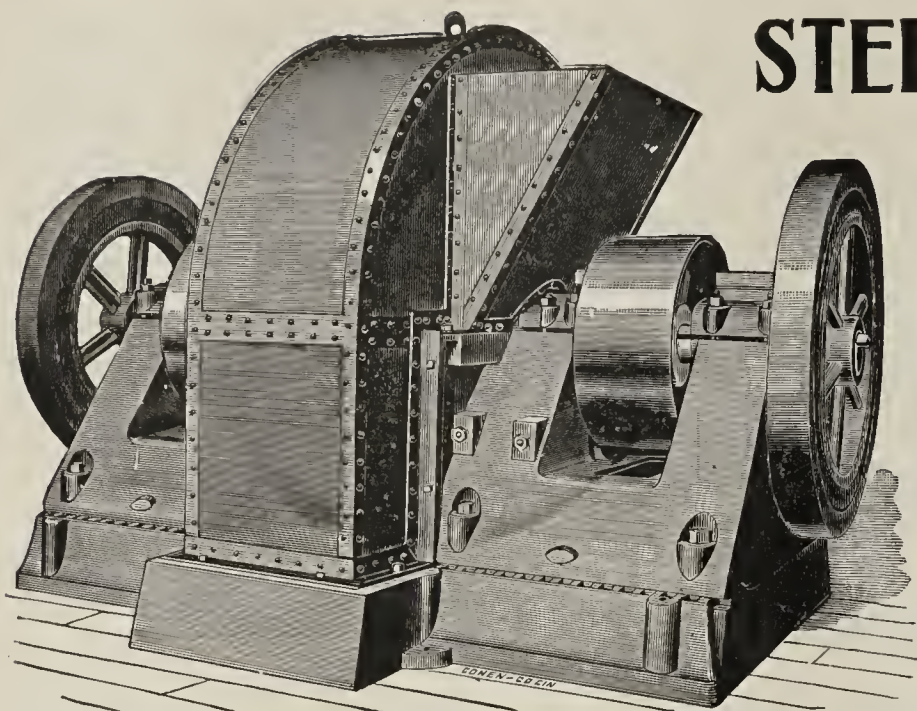
5 Trains daily to Dayton.
2 Trains daily to Toledo.
2 Trains daily to Detroit.

Observation, Vestibuled Coaches and Parlor Cars on Through Express Trains. Pullman and Wagner Sleeping Cars on night trains.

G. W. Hayler, D. P. A. } Indianapolis,
W. J. Nichols, T. P. A. } Ind.
D. G. EDWARDS,

Passenger Traffic Manager.





STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

Aurora, Ind.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

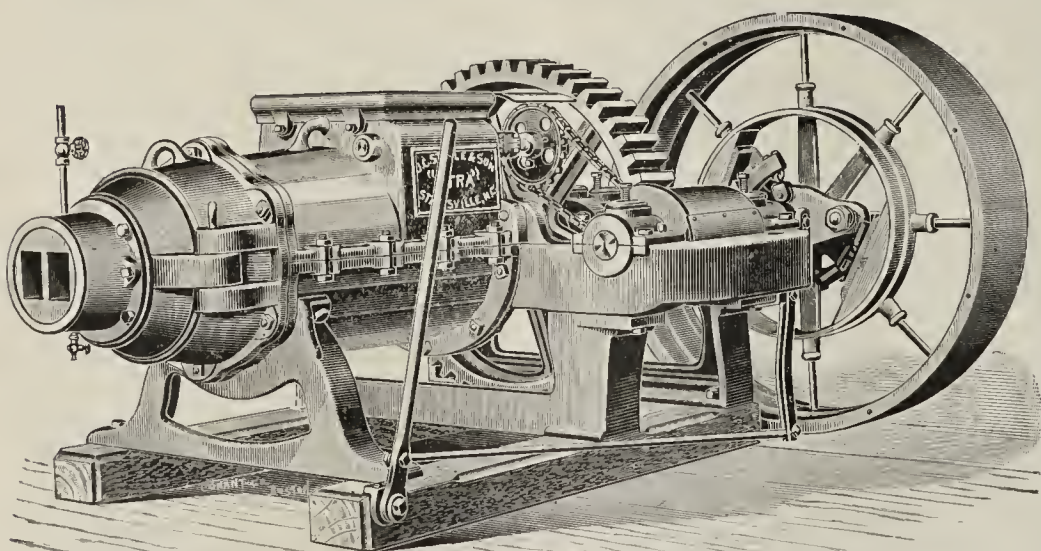
Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

The New South Brick Machinery



X-tra Machine. Capacity 25,000.

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.

TACCIA, VA., June 30, 1896.

J. C. STEELE & SON, Statesville, N. C.

In answer to your enquiry will say we are using one of your latest Brick Machines shipped us about two months ago, and that it gives us pleasure to recommend it to any one wishing a good Brick Machine and one that will do all that is claimed for it.

We have had it thorough tested and it turns out work perfectly satisfactory. The contractor who is building the cotton factory here says its work is of an unusually high order.

Yours respectfully,

T. A. CAPPS & CO.

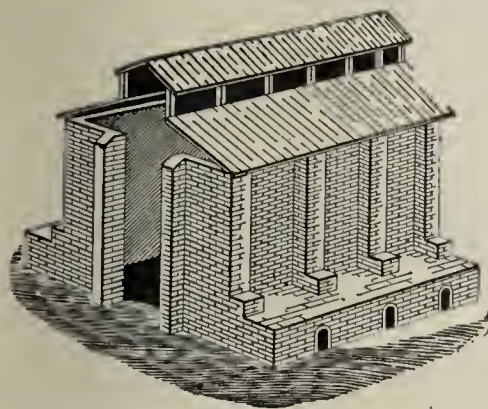
Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

ROPKEY-MASON ENGRAVING CO.,

INDIANAPOLIS, IND.

Make the finest engravings of any and every kind—Wood Cuts, Photo-Engravings and Etchings. We made a specialty of Clayworking Machinery, and will be glad to quote you prices. Send for Samples.



Up-Draft Kiln.

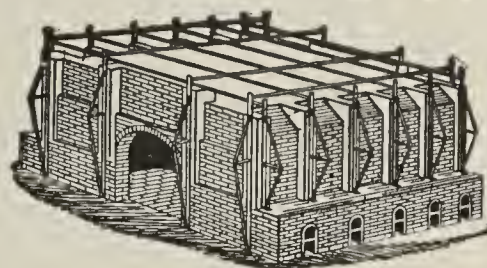
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET. The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiln.

ALSIP'S LATEST IMPROVED DOWN and UP-DRAFT KILN.

IS SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

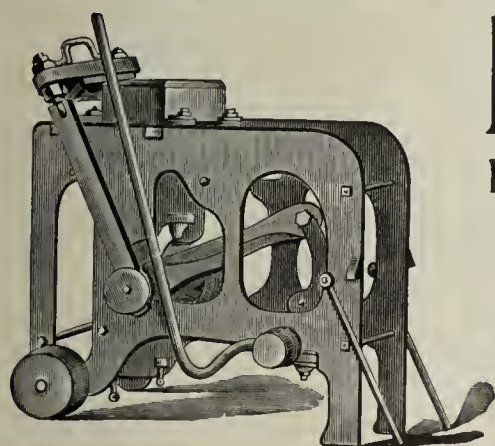
If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

Address, **S. H. ALSIP,**

Days Brick Yard.

BELLEVILLE, ILL.



RED BRICK PRESS.

GEORGE CARNELL,

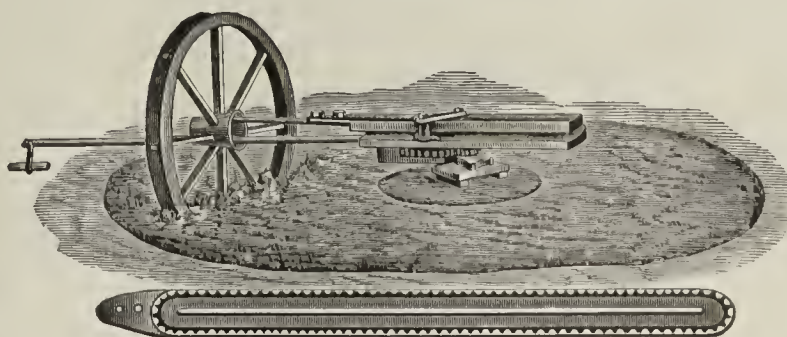
Nos. 1,819, 1,321 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

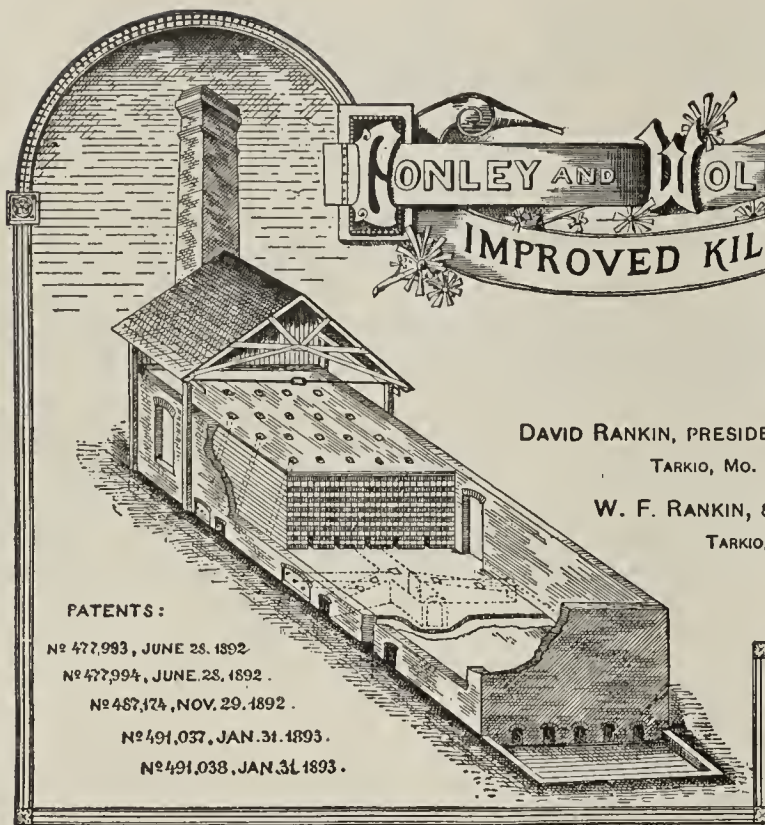
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Send for Circular and Price-List.



CONLEY AND WOLFE
IMPROVED KILN COMPANY.

TARKIO, Mo.

OFFICERS:
DAVID RANKIN, PRESIDENT, **JOSEPH CONLEY, VICE-PRESIDENT,**
 TARKIO, Mo. MOUND CITY, Mo.
W. F. RANKIN, SEC'Y AND TREAS, **J. M. WOLFE, GEN'L M'GR,**
 TARKIO, Mo. TARKIO, Mo.

PATENTS:
 No 477,993, JUNE 28, 1892.
 No 477,994, JUNE 28, 1892.
 No 487,174, NOV. 29, 1892.
 No 491,037, JAN. 31, 1893.
 No 491,038, JAN. 31, 1893.

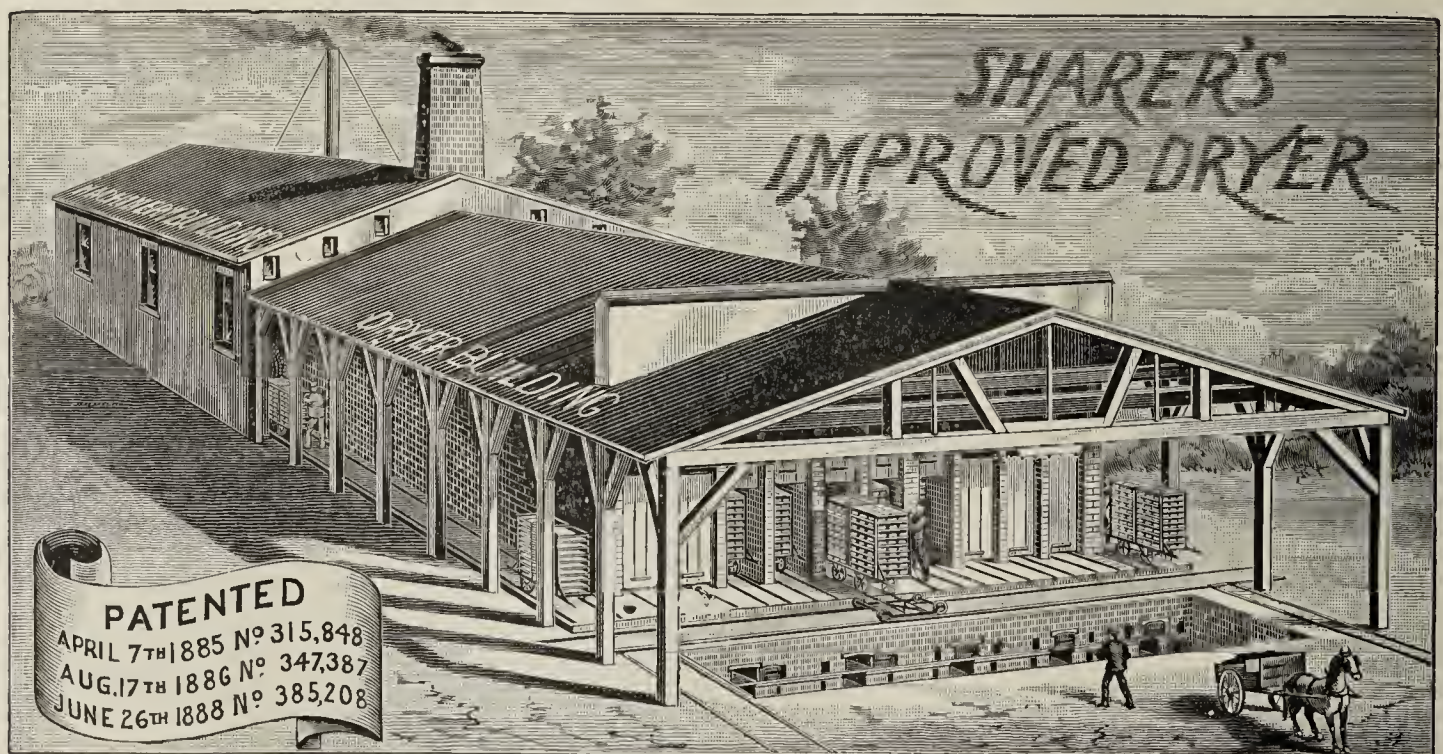
THIS KILN is cheap to construct, simple in operation and permanent in character. It has no crown to fall in and costs nothing for repairs. The dampers in the bottom give complete control of the heat and draft. It burns all brick evenly and thoroughly. It heats the brick gradually and cools the same, producing a tough and thoroughly annealed brick. It requires less than 200 lbs. slack coal per thousand to burn the very best annealed vitrified shale paving brick. It saves labor—one man can fire the largest kiln.

The Slack is converted into Gas and all the Heat Energy in the Coal is Utilized.

IT IS A SMOKE CONSUMER AND A PROFIT PRODUCER. ❖ **YOU NEED THIS KILN.** ❖ WRITE OUR GENERAL MANAGER FOR FULL INFORMATION.

Geo. W. Sharer,

Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.



COMPLETE Dryer and Kiln outfits, and Complete Plants a specialty. Address

GEO. W. SHARER, 2224 Tioga, St. **Philadelphia, Pa.**

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

It has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

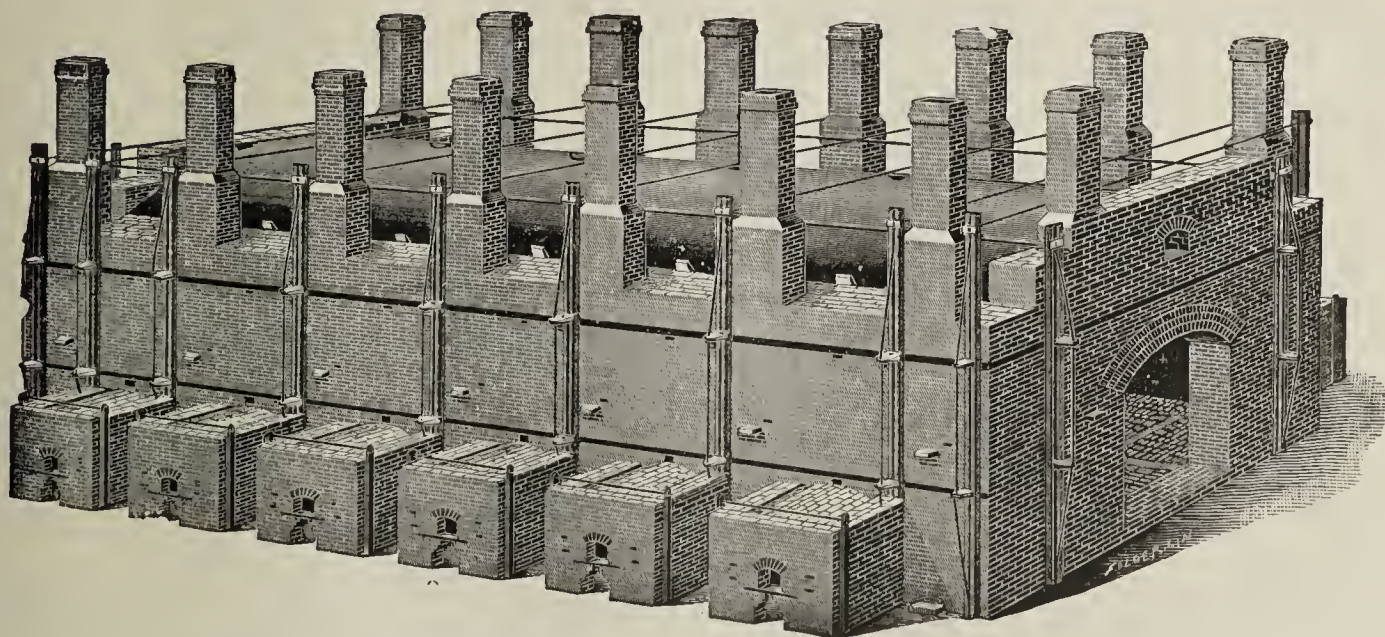
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



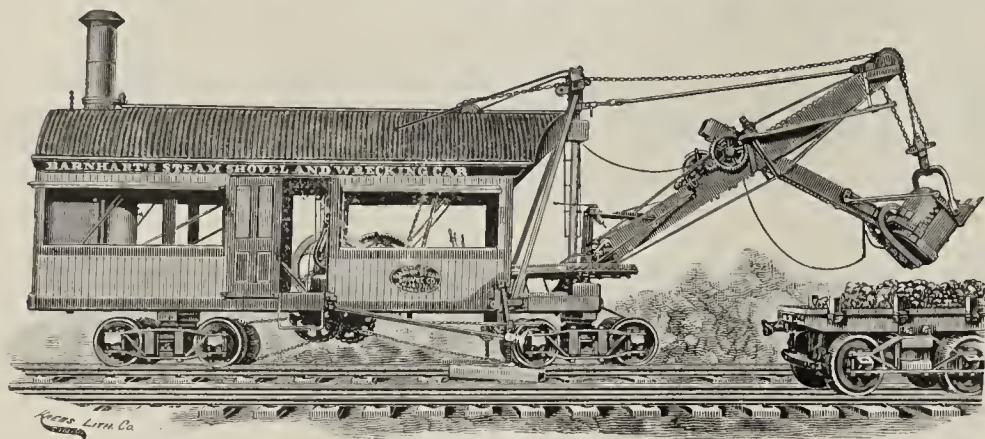
A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

Steam Shovels for Brickyards.



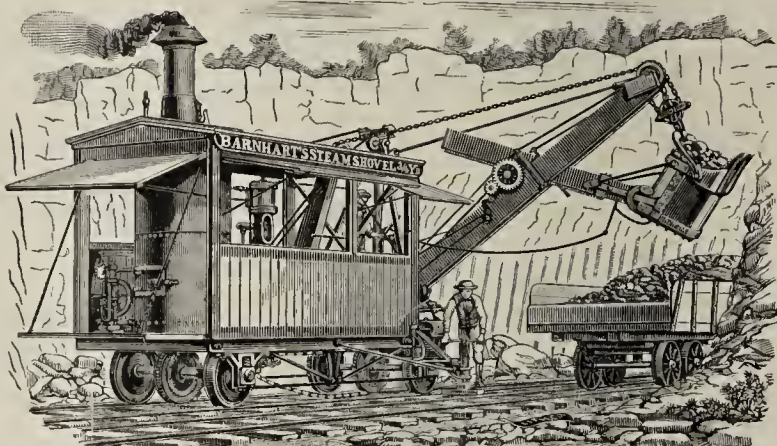
STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**



STYLE C—¾ YD.

The Man Who Wants the Earth Generally Gets It==

When he dies, and frequently he gets it sooner than he wants it. Worry and aggravation often hastens the event.

'97 *Outing*
BICYCLES.

\$100

\$75

\$50

Do not create fretfulness by the many little inconveniences found in other wheels. Nothing ever comes loose; the balls remain in place and the adjustment is always secure.

Outings are built to be "temper proof." And they are.

You don't have to "go around the other way" just because the road is bad, if you're on an Outing. They plow through mud as readily as they sail over asphalt. They are mud proof as well as dust proof. Positively so. That's one of the reasons why experienced cyclists speak so well of them.

Send for '97 Art Catalogue, telling how they are made.

HAY & WILLITS MFG. CO.

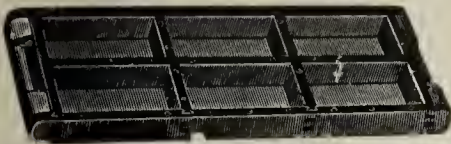
76 N. Penn. St.,
INDIANAPOLIS.

Brick Moulds at a Discount.

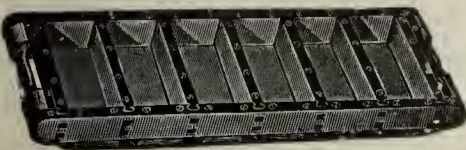
On and after June 1st, you can get 20 per cent off the list on Machine Moulds and other supplies, at reduced prices. If you have not got the LIST, send for it. Address the largest and most complete works of the kind in the world.



3 Brick Hand Mold.



16 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

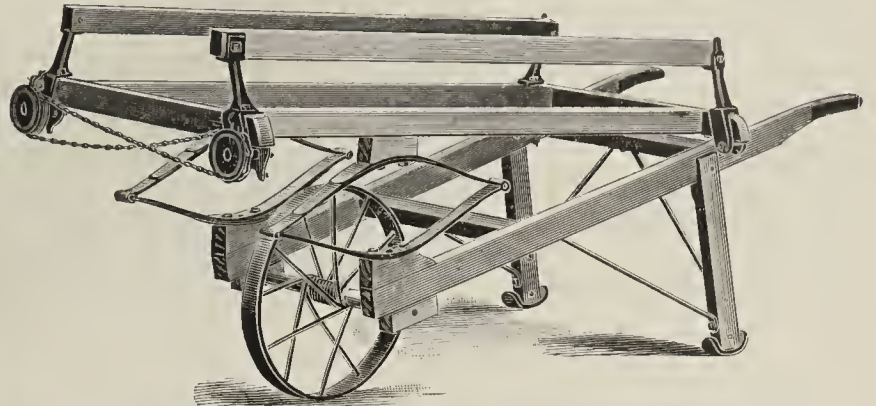
We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

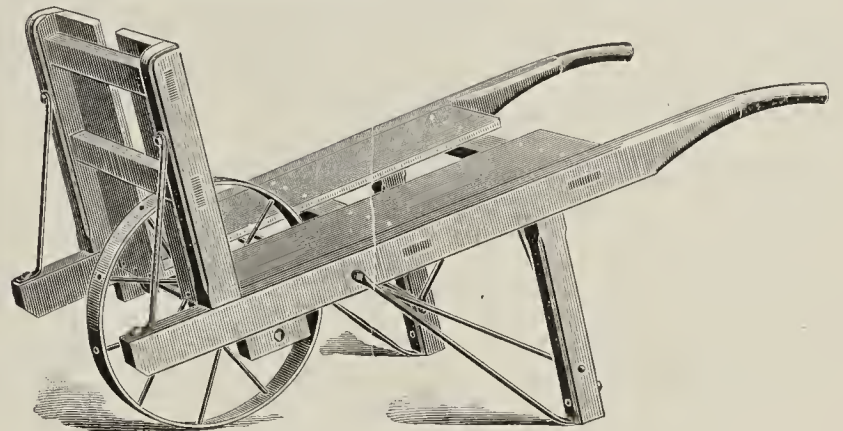
Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

Send for catalogue and price list. Address,
D. J. C. ARNOLD, New London, Ohio.

TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market.
BARROWS, For various purposes. Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind

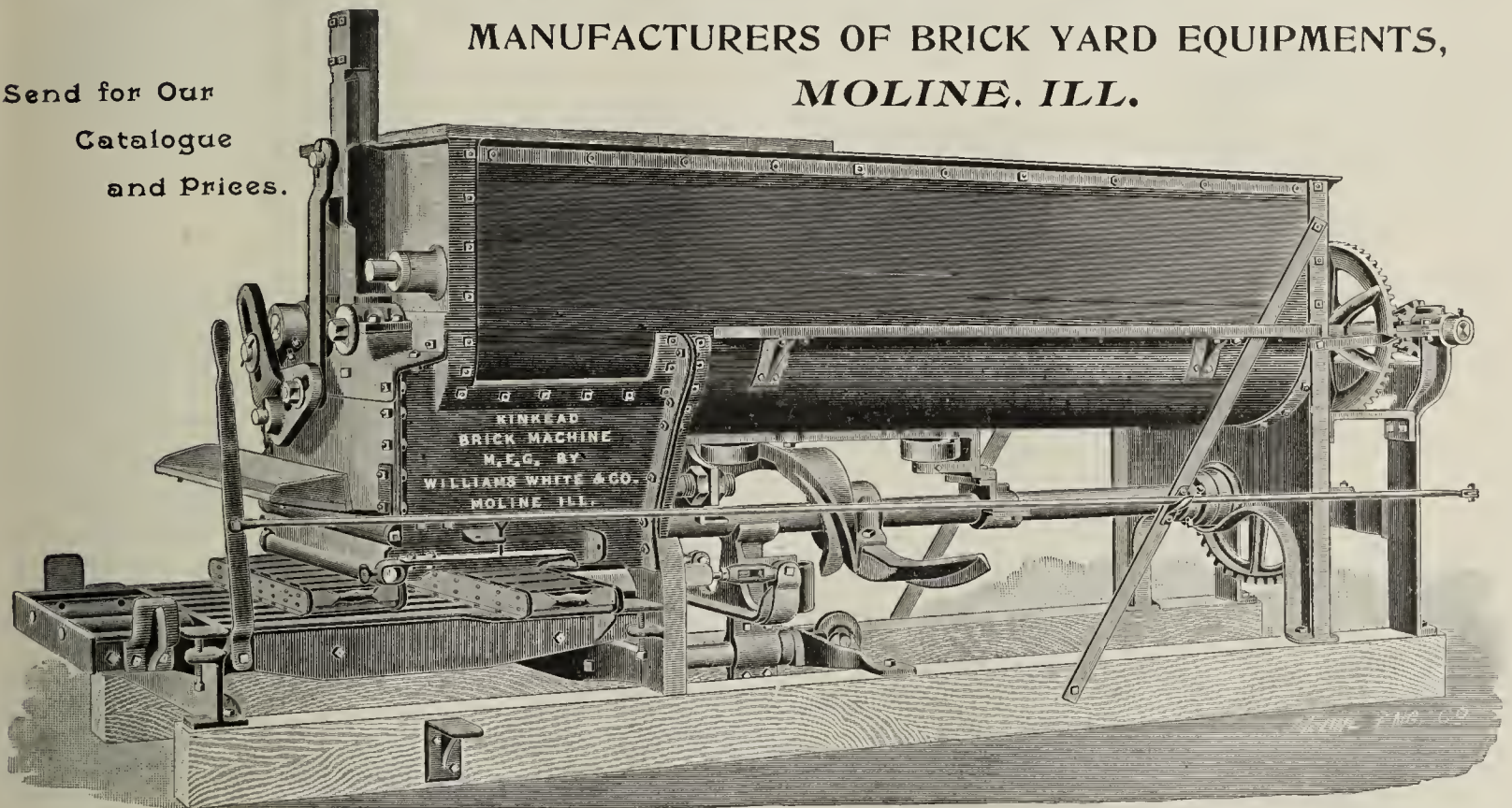


No. 4 Brick Barrow.

WILLIAMS, WHITE & CO.

MANUFACTURERS OF BRICK YARD EQUIPMENTS,
MOLINE, ILL.

Send for Our
Catalogue
and Prices.



The **KINKEAD MACHINE** takes the clay direct from the bank, preparing it more thoroughly than any pug mill or machine on the market. It fills the mold full and sharp every time. It is simple in construction, easy to take care of, and durable.

We solicit correspondence also on complete outfits for brickyards—molds, trucks, barrows, cars of all kinds, elevators, sanders, disintegrators, etc., etc. Get our Mold circular and prices.

(Mention the CLAY-WORKER.)

Do You Want

A BRICK MACHINE

..... A DRY PAN

.... A PUG MILL?

IF SO DON'T FAIL TO

Get
Our
Prices,



They
Can't
... be
Beat.

.....

WOOLLEY'S MACHINERY is built on mechanical lines and of the best material. Our "**Iron King**" is a non-breakable brick machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ableness of every part.

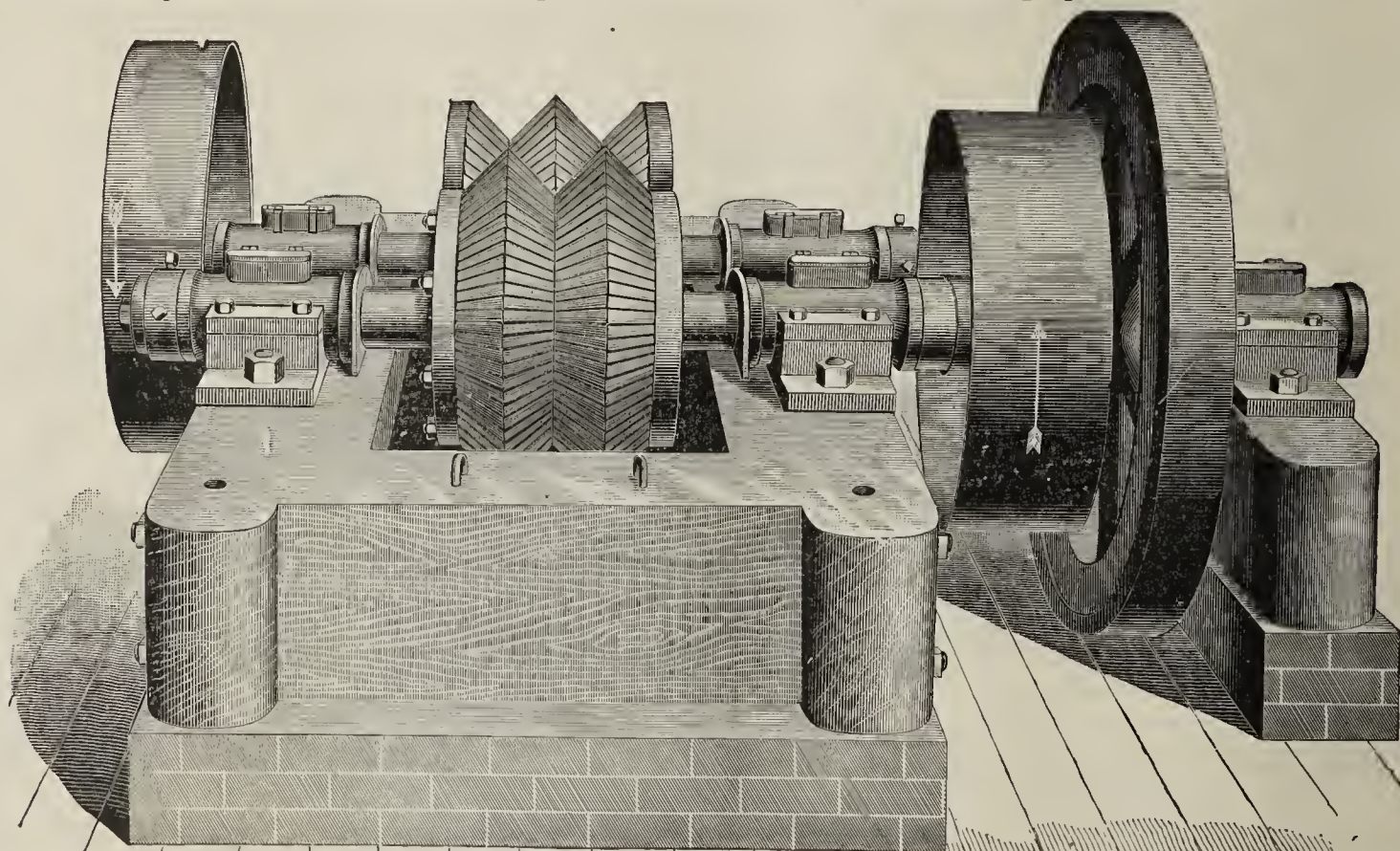
We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

It will afford us pleasure to correspond with you.

Mention the Clay-Worker

NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building
26 Cortland and 21 Dey Streets, New York, U. S. A.

DECISION IN FAVOR OF CHAMBERS

IN THE

Infringement Suit Against J. W. Penfield & Son

ON

Brick Machine Patents Owned by Chambers Bros. Co.

PHILADELPHIA, PA.

NOTICE

To the Public Generally and to Manufacturers and Users of Wire Cut-off Brick Machines Especially.

After a protracted litigation, in which the defendants, with the aid of able legal counsel, contested every point and raked Europe and America to find something that would defeat our patents, the **United States Circuit Court at Cleveland, Ohio**, in the suit brought by us against J. W. Penfield & Son, has sustained as good and valid all of the essential and important claims in suit covering the endless belt or carrier and the wheel wire cut-off Brick Machines of our basic patents, No. 297,671, No. 297,917, and No. 362,204, besides certain claims for minor features of construction of these and other of our patents.

We are advised by our counsel (Joshua Pusey, Esq., of this city) that all machines constructed or used, without license from us or our predecessors, and operating on the principles of the endless belt or carrier machine of patents Nos. 297,671 and No. 297,917, are infringements of said patents.

Also, that all such unauthorized wire cut-off machines having a rotating wheel carrying cut-off wires and having a cam, or cams, for guiding, or regulating, the movement of the wheel so that the wires will take their proper path through the moving bar of clay in severing the latter into bricks, and means for causing the cut-off wheel to move in unison with the bar, are infringements of patent No. 362,204.

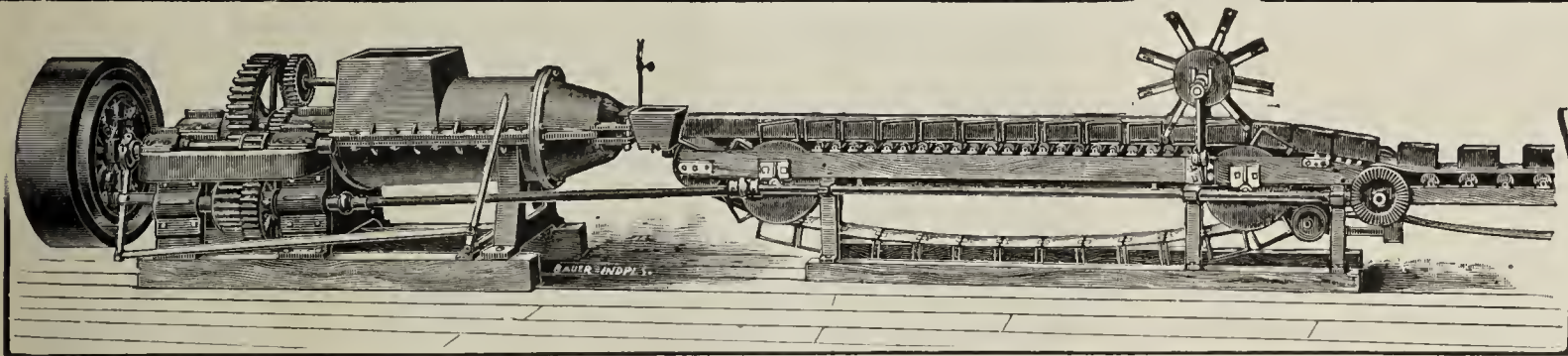
Also, that all such unauthorized machines having in combination with the cut-off wheel and the cam, or cams, a positively driven friction belt, for aiding in driving said wheel, are infringements of the last mentioned patent.

Also, that all such unauthorized machines having endless belts or carriers, or wheels, with U-shaped elastic bows secured thereto, for holding the cut-off wires, infringe, respectively, patents Nos. 297,671, and 297,917, and 362,204.

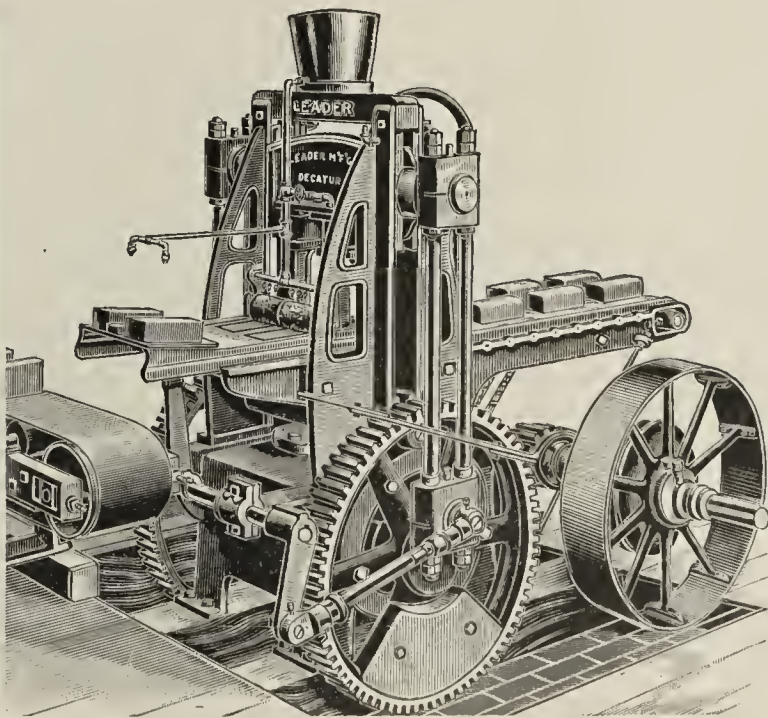
All manufacturers and users of Brick Machines infringing the said patents and claims of other of our patents that were adjudged to be valid in the case against J. W. Penfield & Son will please take notice that we intend enforcing our rights in said patents and in all others owned by us.

CHAMBERS BROTHERS COMPANY,

Fifty-second St. below Lancaster Ave., Philadelphia, Penn., U. S. A.



* **LEADER** *
MANUFACTURING CO
 DECATUR ILL.
 MANUFACTURERS OF
BRICK MACHINES, BRICK PRESSES,
PUG-MILLS, CRUSHERS
DISINTEGRATORS, AUTOMATIC CUTTERS,
 + **ELEVATORS** +
 AND
COMPLETE OUTFITS.
 SEND FOR PRINTED MATTER.



To All Whom it May Concern.

The American Clay-Working Machinery Co.,

**Replies to the Chambers Brothers Company's Circular in
Reference to Decision in Patent Suit for Infringe-
ment against J. W. Penfield & Son.
Please Read Carefully.**

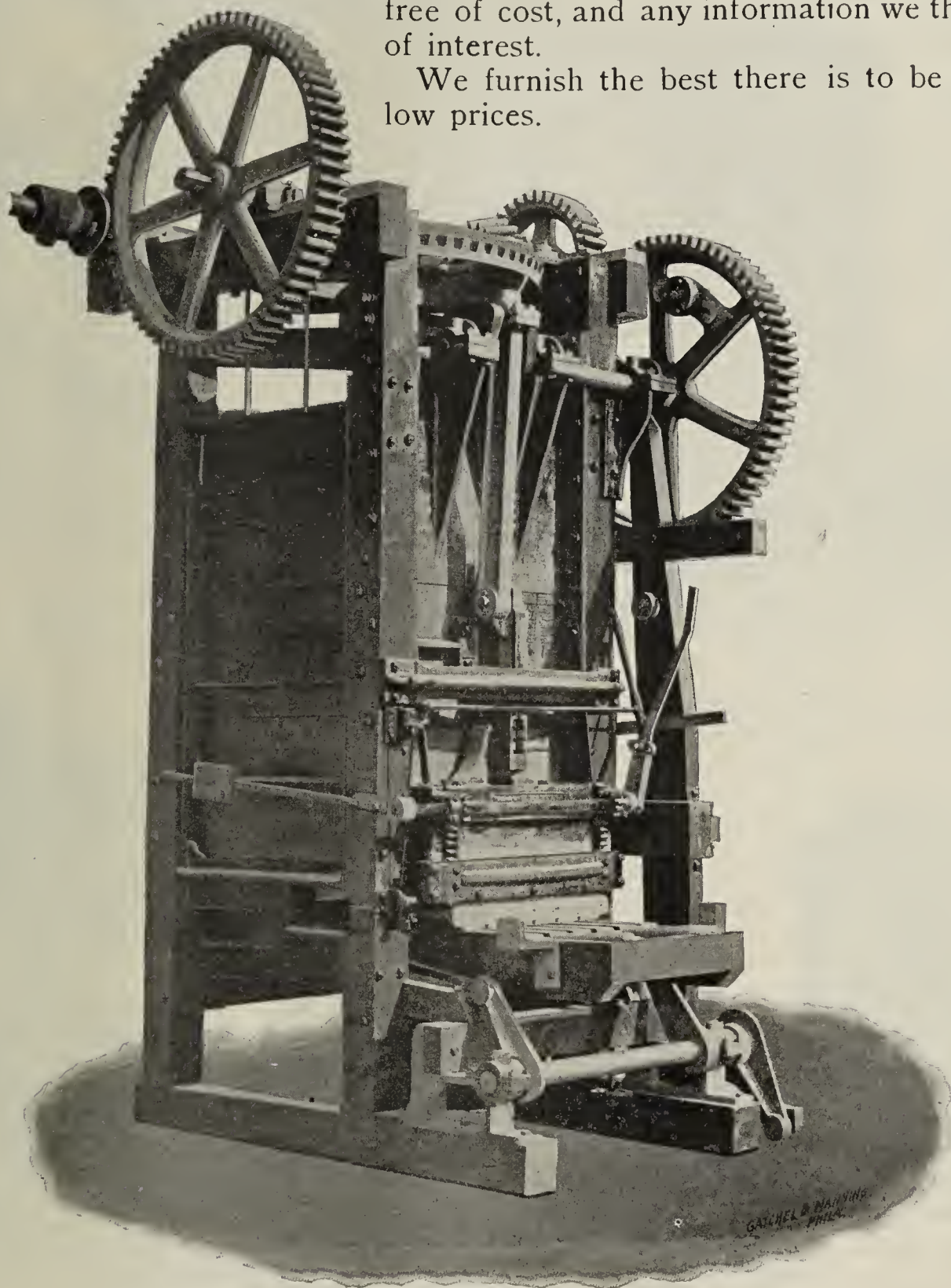
The AMERICAN CLAY-WORKING MACHINERY COMPANY, of Bucyrus and Willoughby, Ohio, takes pleasure in informing the trade that all of their modern, best and most important brick machines are entirely unaffected by the decision in the case of Chambers Bros. Co. vs. J. W. Penfield & Son. The circular of the Chambers Brothers Company calling attention to this decision in the case is likely to deceive the unwary. Attempt was made by Chambers to have his endless belt cut-off patents Nos. 297,671 and 297,917, broadly construed to cover all revolving cut-offs. This the Court refused to do, and held that the Penfield Machine did not infringe those claims of the two earlier patents. One machine formerly made by J. W. Penfield & Son was held infringed upon patent No. 362,204, but this is an old style machine. None of that class have been built for the last three years. The American Clay-Working Machinery Co. manufactures and sells to the public Cutting Off Machines under the authority and protection of the O. W. Johnston patent No. 478,346, and the John Thompson patent, No. 496,286, which have not been attacked in the Courts by anybody. It is conceded by Chambers Bros. Co. that our primary wheel-cut-off machine, manufactured under Patent No. 391,698, sometimes called the French cut-off, ante-dates their patent. This machine we manufacture and are now offering to the trade. In addition to the cut-off tables manufactured under the Johnston patent, No. 478,436 and the Thomson patent, No. 496,286 and Frey patent No. 391,698, we manufacture the Automatic Side Cut-off, the Semi-Automatic Cut-off, the Hand Cut-off, the Combination Cut-off, the Galesburg End-cut Machine and the Frey Wheel End Cut-off Machines. Also machines so arranged as to work satisfactorily, either for end-cut or side-cut brick—none of which are claimed to infringe the Chambers patents. It is not disputed by any one that the American Clay-Working Machinery Co. owns and controls the fundamental patents on this side-cut-off class of machines. Their superiority over the end-cut machines of the Chambers class is too well known and recognized by brick manufacturers to need further comment. Our legal counsel, Messrs. Wood & Boyd, of Cincinnati, Ohio, advise us that our present machines are not infringing any of the claims involved in the Chambers suit. We believe their advice to be sound—therefore we guarantee all parties purchasing and using brick and tile cut-off machines made by us, to hold them harmless from all loss, costs or damages by reason of any alleged infringement of said Chambers patents.

THE AMERICAN CLAY-WORKING MACHINERY CO.,
BUCYRUS, OHIO, U. S. A.

We Furnish Everything a Brickmaker Needs.

Let us furnish you with any information you want. We send plans of complete plants free of cost, and any information we think will be of interest.

We furnish the best there is to be had and at low prices.



Letter "A" Weight 10,000 Pounds.

ESTABLISHED 1857.

INCORPORATED 1887.

The Henry Martin Brick Machine Mfg. Co.,

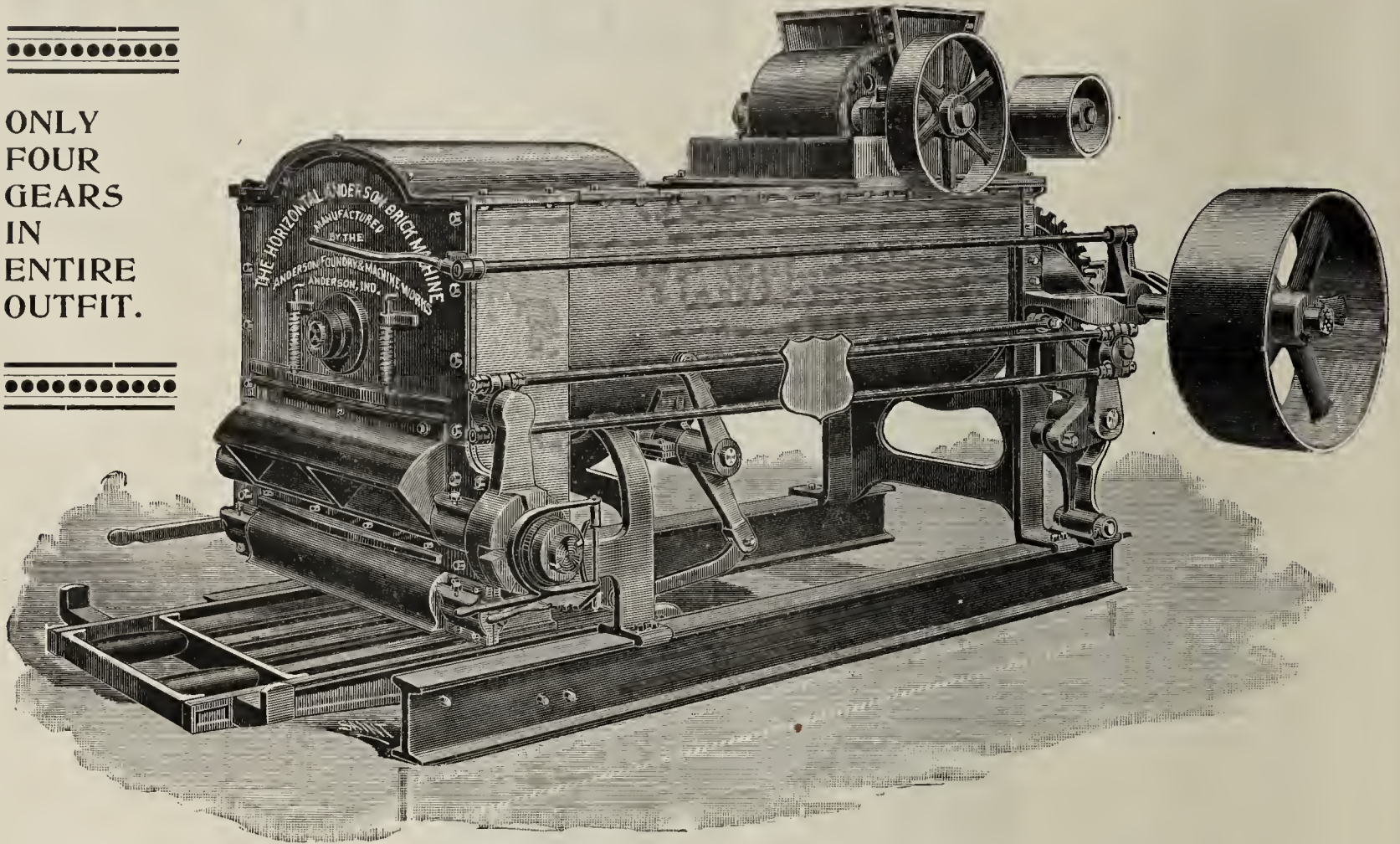
Send for our Illustrated Catalogue.

Lancaster, Penna., U. S. A.

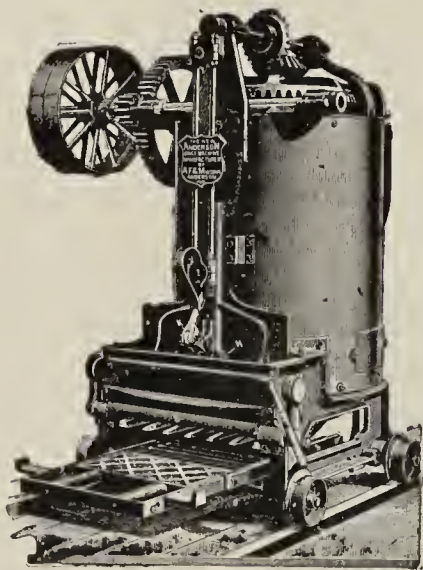
DON'T

Buy a Brick Machine until you Investigate the **HORIZONTAL ANDERSON**. The latest — the Strongest — Greatest Pressure and Pugging Capacity.

ONLY
FOUR
GEARS
IN
ENTIRE
OUTFIT.

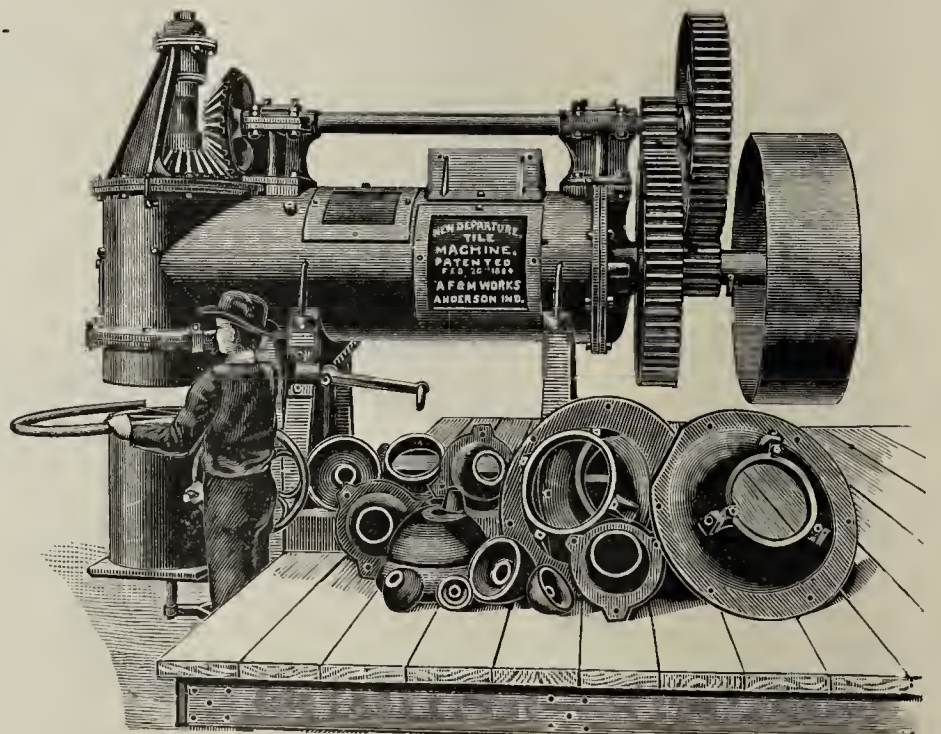


Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.

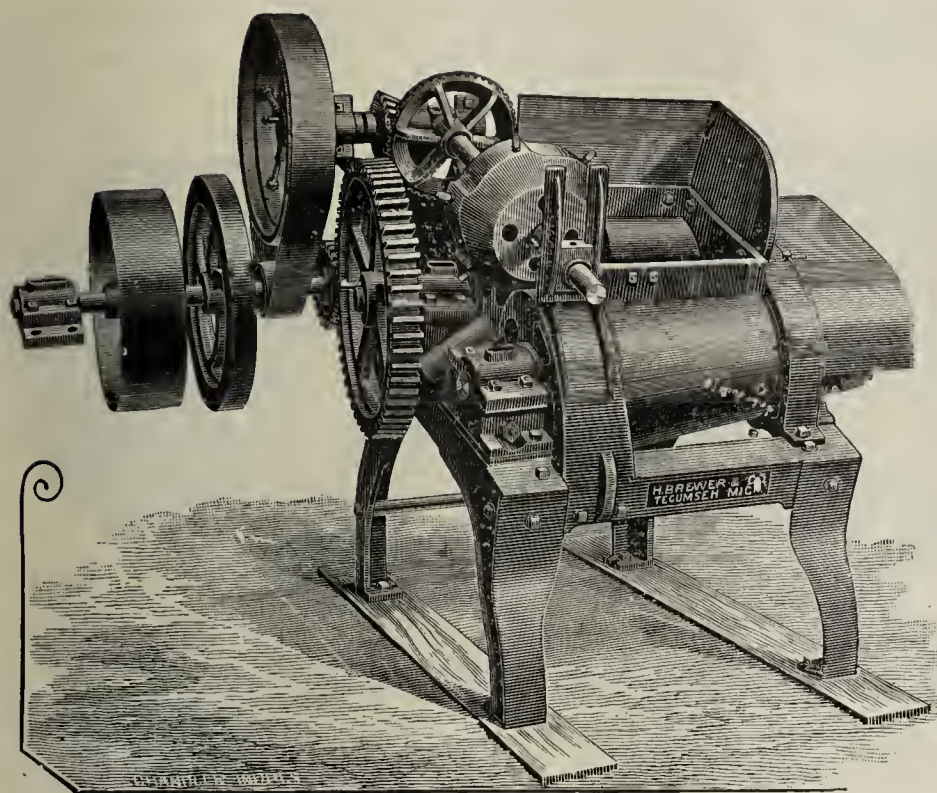


NEW DEPARTURE TILE MILL.

The NEW DEPARTURE TILE MILL.

The only mill for making Tile, Pipe and Hollow Ware, from 8 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS, Anderson, Indiana



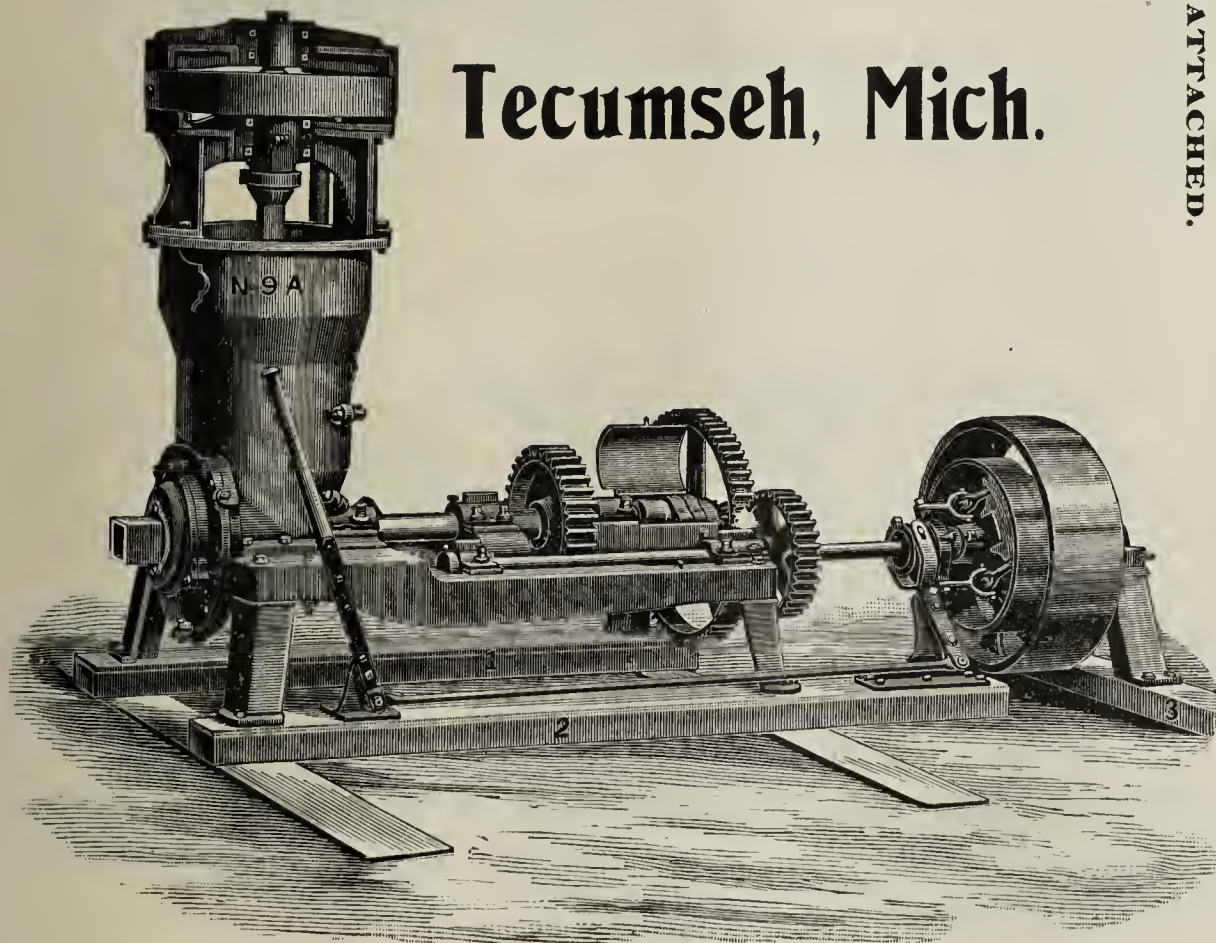
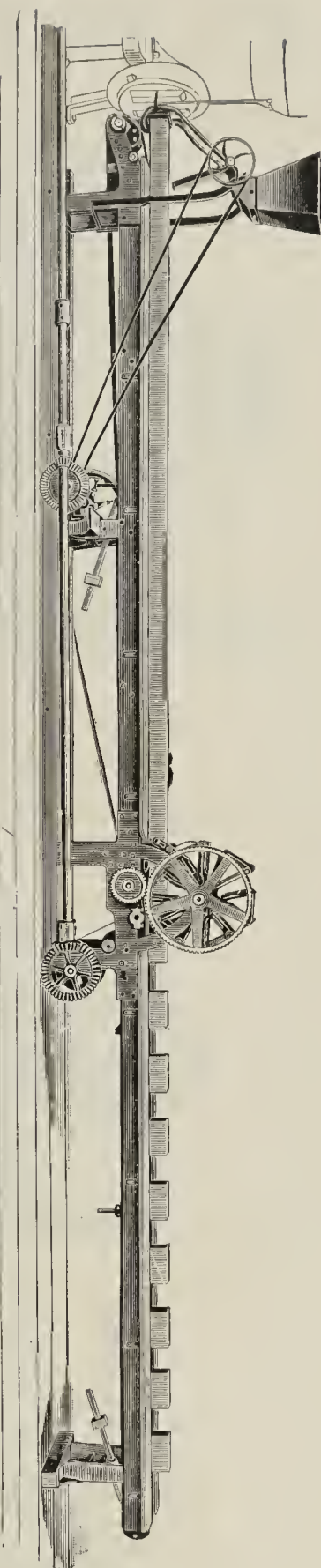
STONE EXTRACTING CLAY CRUSHER.

Manufactured by

H. Brewer & Co.,

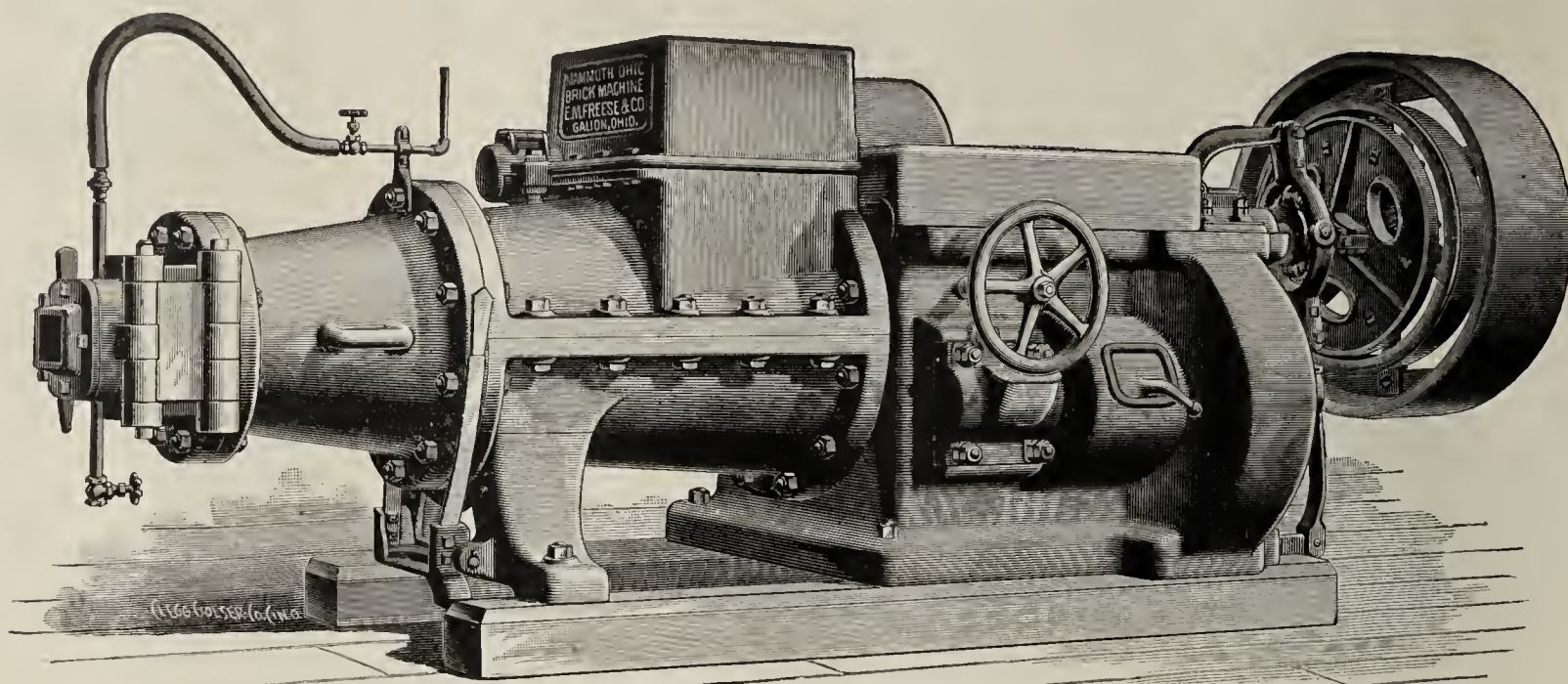
Tecumseh, Mich.

AUTOMATIC END CUT BRICK CUTTER with SANDER ATTACHED.

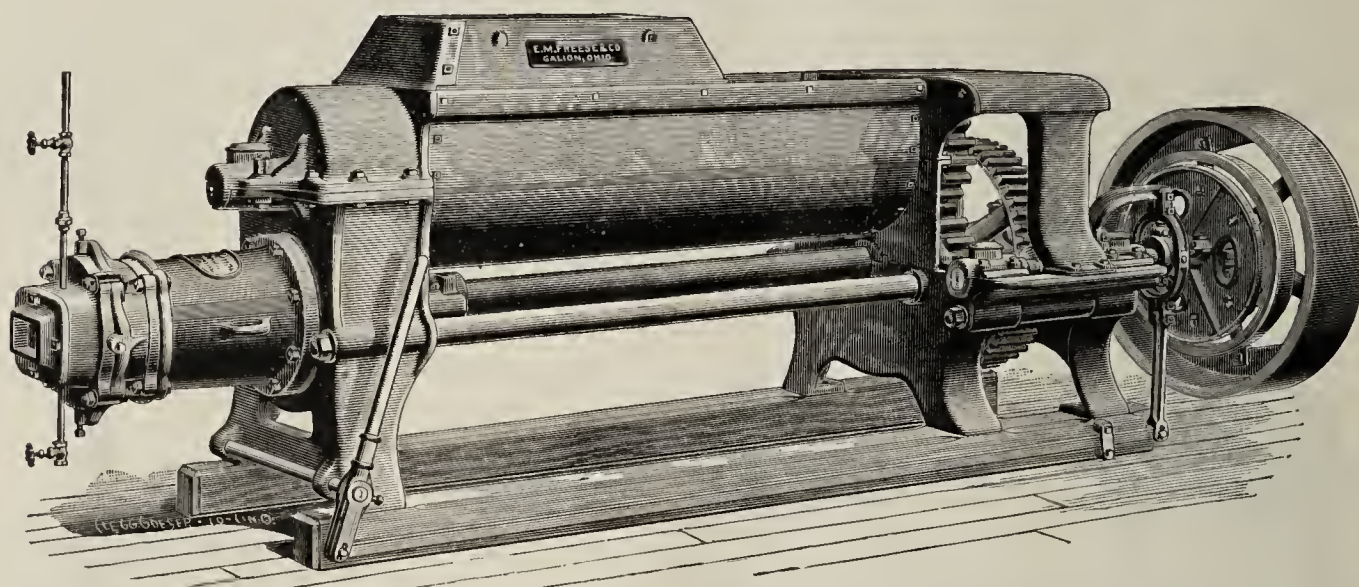


No. 9 "A" BRICK MACHINE.

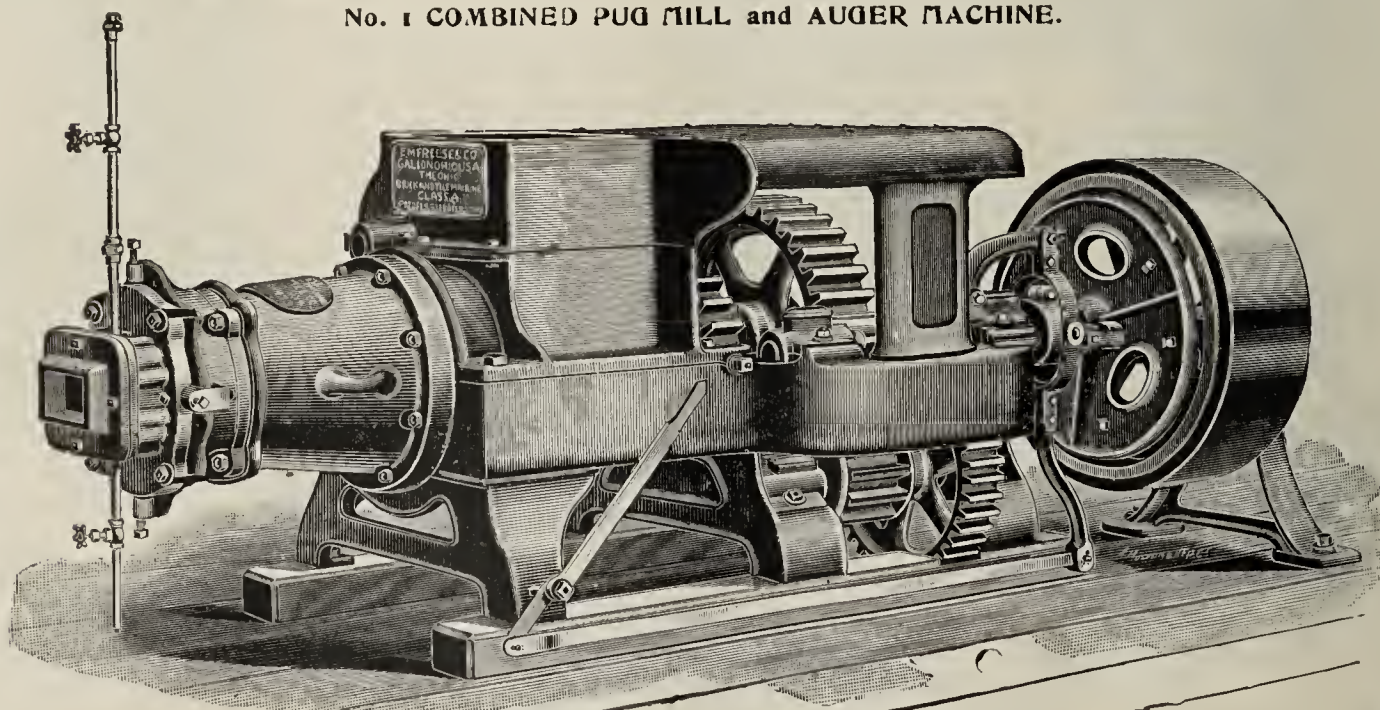
E. M. FREESE & CO., GALION, OHIO.



MAMMOTH BRICK MACHINE.



No. 1 COMBINED PUG MILL and AUGER MACHINE.



IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

Send for 136 page Catalogue.

Something New

and Promising.

....

No. 3 POWER RE-PRESS.

For re-pressing high grade Stiff Mud, Face and Panel Bricks. Capacity 5,000 to 6,000 brick in ten hours. This machine has no superior for making the very finest high grade bricks. It is automatic feed and automatic delivery and is operated with very little power.

In bringing out this new press we have carefully studied the wants of the brick maker. We have embodied in it numerous good points. Though it has been on the market only sixty days we have already sold half a dozen. We can enumerate to the extent of pages on its superiority and qualities but the following coming from a user will suffice:



THE VOICE OF EXPERIENCE!

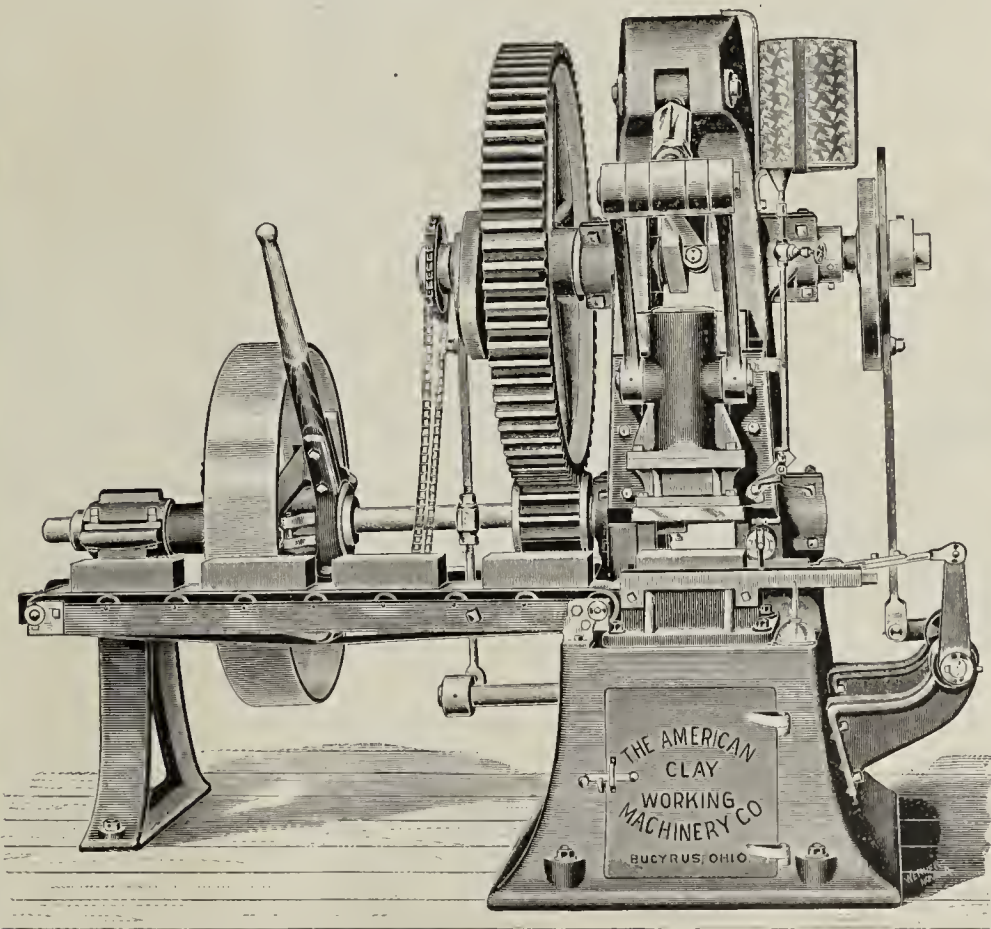
TRENTON, N. J., June 21st, 1897.

THE AMERICAN CLAY-WORKING MACHINERY CO., Bucyrus, Ohio.

GENTLEMEN:—In reply to your favor of 18th inst. will say that we are well pleased with the Re-press Brick Machine which we recently purchased from you, up to this time have no cause for complaint. At the speed we are running the machine, we press 1000 brick per hour, we are well satisfied and can cheerfully recommend same.

Yours truly,

TRENTON FIRE CLAY & PORCELAIN CO.
O. O. BOWMAN, Pres.



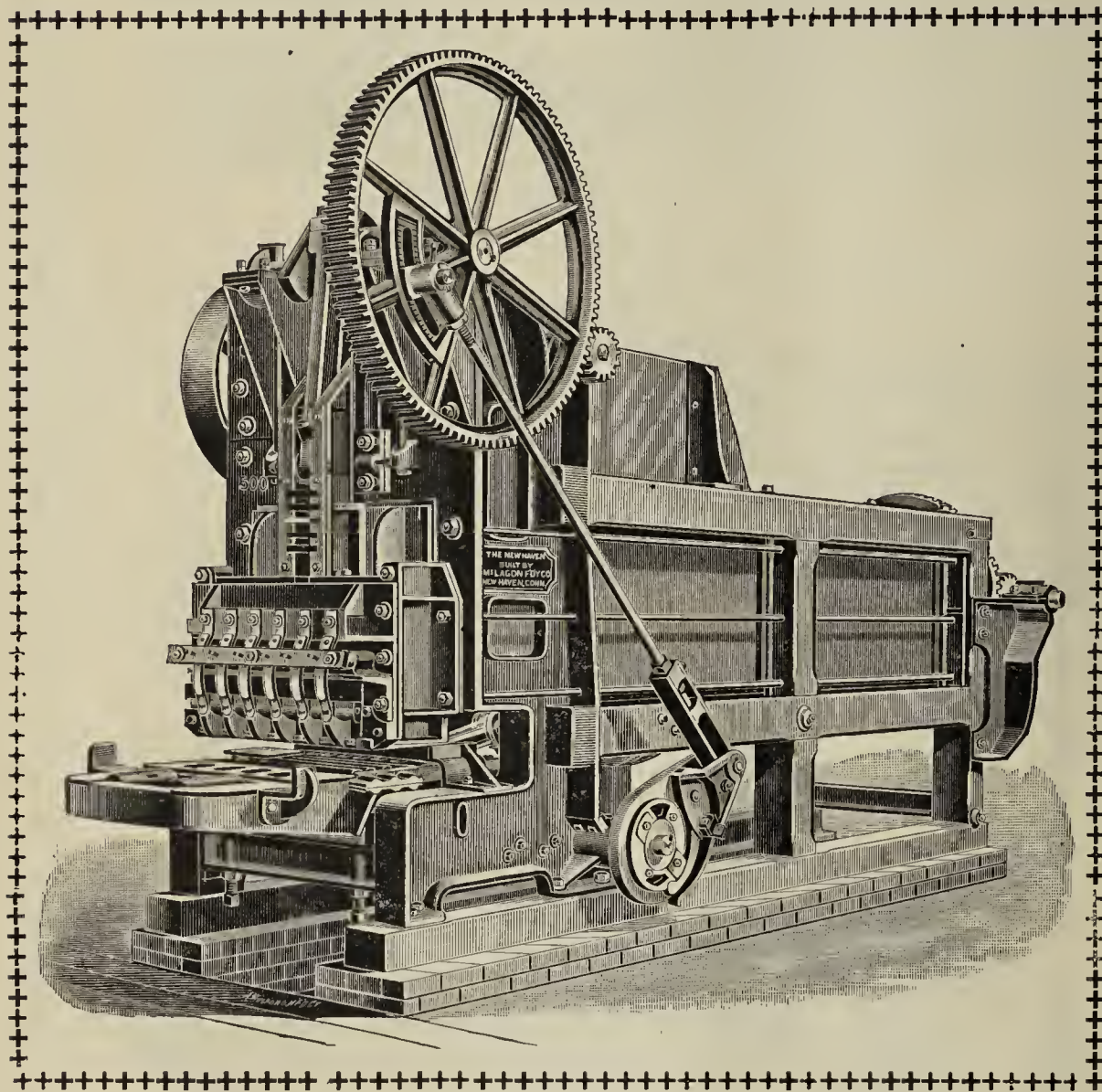
NEW	} 39	{ Cortlandt		
YORK			and	Street,
OFFICE:			41	Room 103.



The American Clay-Working Machinery Co.,
Bucyrus, Ohio, U. S. A.

“New Haven” Brick Machinery,

Solid, Strong, Substantial Structures.



Soft Clay Ma-
chinery is Our
Specialty.

• •

We propose to
Please each Pa-
tron.

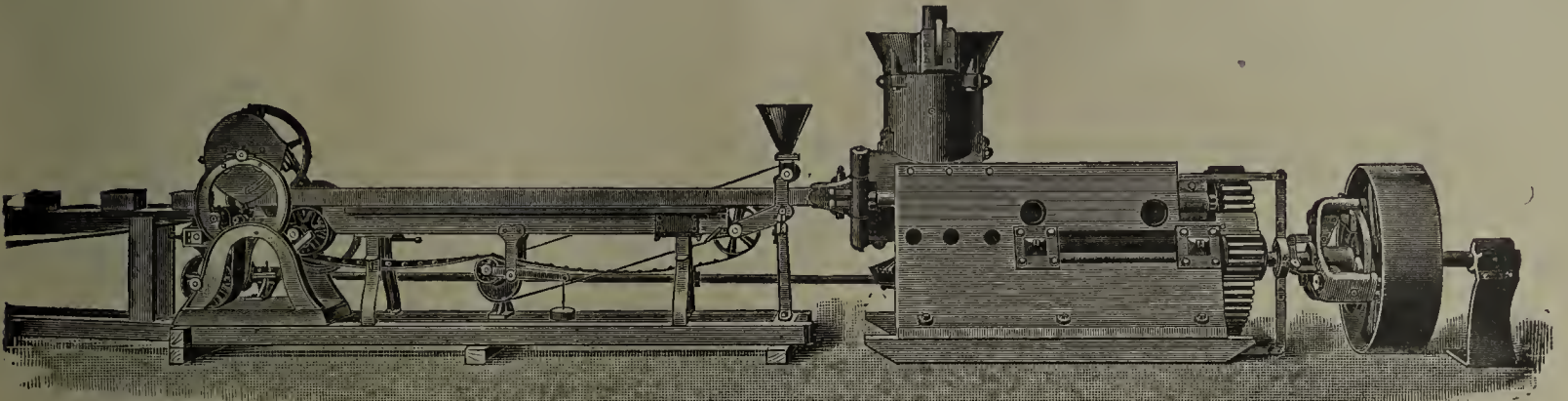


SEARCHING INQUIRY SOLICITED.

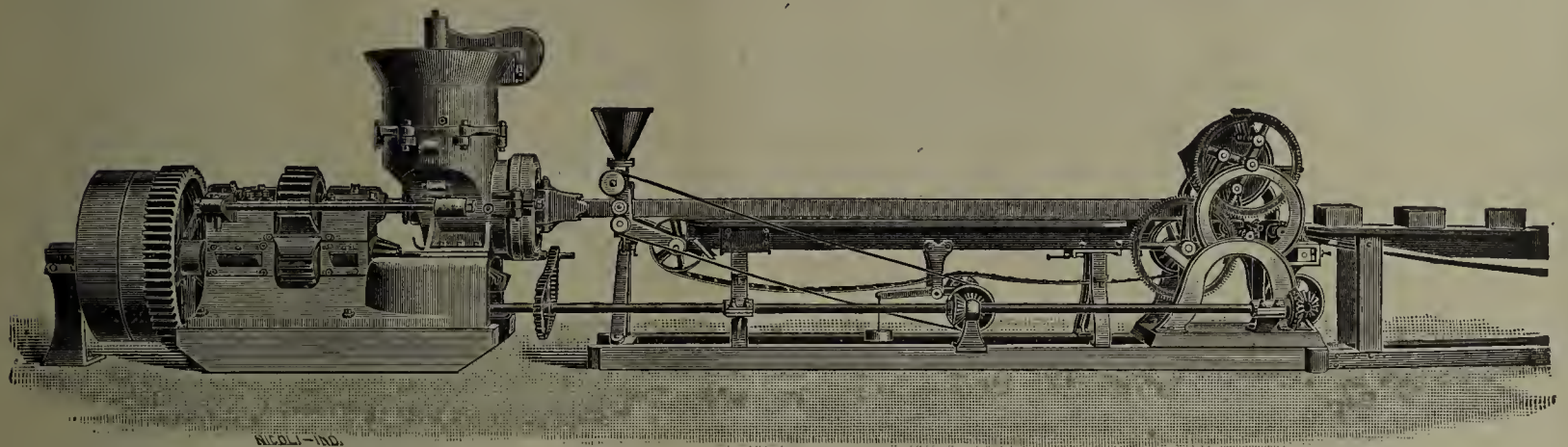
The Eastern Machinery Co.,

NEW HAVEN, CONN.

WONDER MACHINERY.



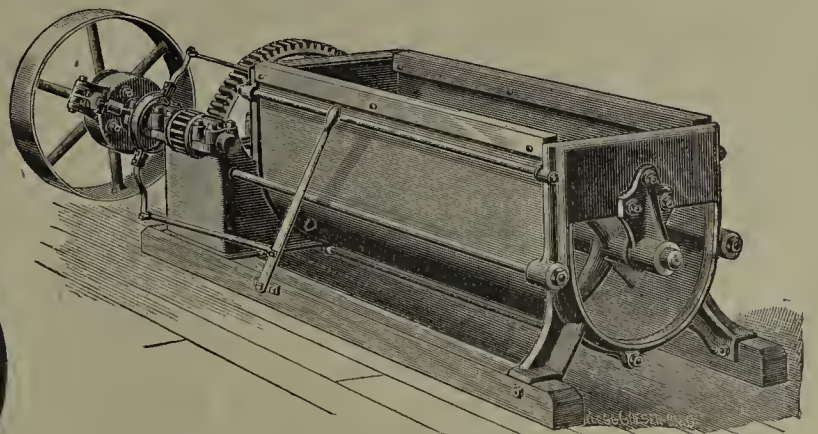
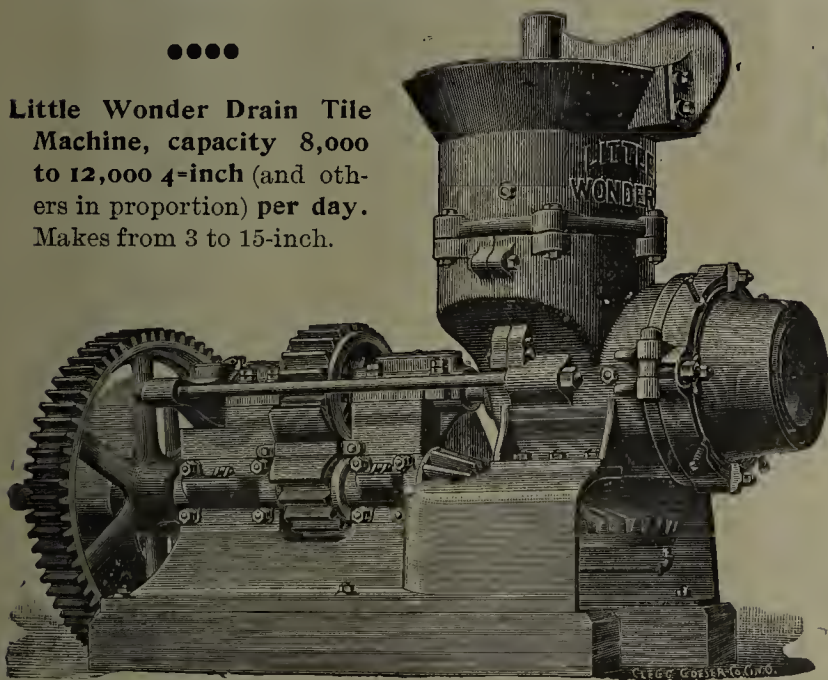
Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.



Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

•••••

Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity.

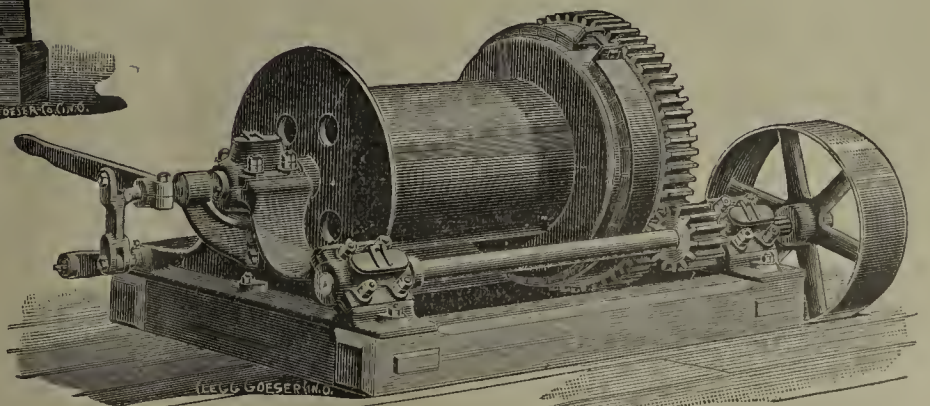
MANUFACTURED BY ~~~

The Wallace Mfg. Co.,
Frankfort, Ind.

CHICAGO AGENT:

Chicago Brick Machinery Co., Chicago, Ill.

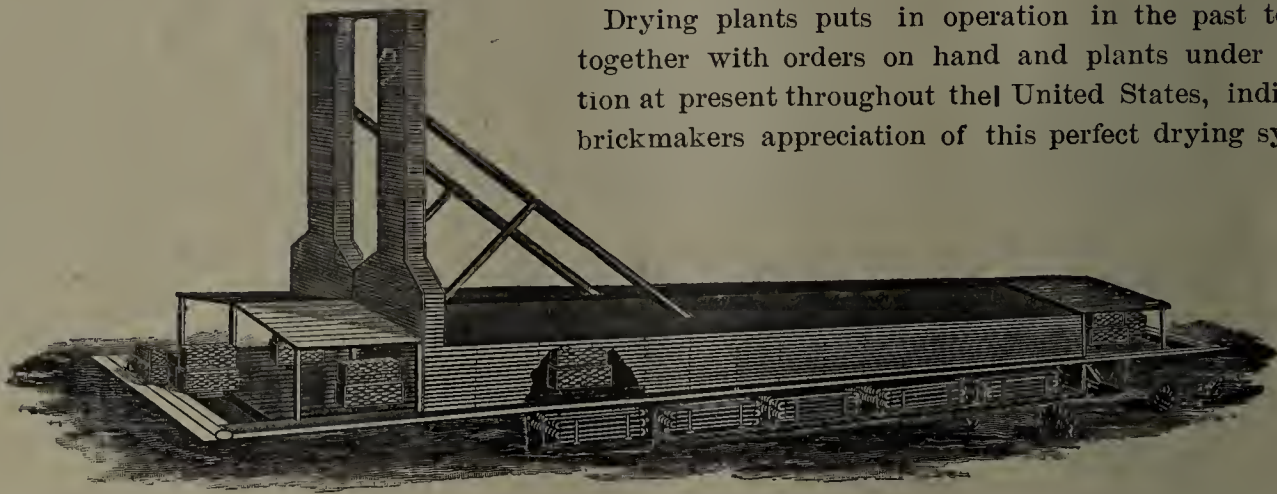
Catalogue Free.



18 x 30 Friction Geared Hoisting Drum.

Iron Clad Dryer.....IN THE LEAD

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

•→•SEE WHAT THEY SAY:←•

WM. SANKEY, THOS. SANKEY,
WM. E. SANKEY, F. M. SANKEY,
T. H. SANKEY, J. F. SANKEY.

CAPACITY: 40,000 BRICK PER DAY.

TELEPHONES: { OFFICE, S. S. 11-3.
WORKS, S. S. 11-2.
WORKS, E. E. 589.

SANKEY BROS., BRICK.

ORNAMENTAL PRESSED, SELECT STOCK, BUILDING, PAVING AND GUTTER BRICK.

SPECIAL AGENTS FOR MARTIN'S IMPROVED BRICK MACHINE.
RAILROAD SHIPPING A SPECIALTY.

OFFICE: 2101 Carson Street.

WORKS: Head of 18th Street, S. S.
Penn and Atlantic Aves., E. E.

PITTSBURGH, PA., May 3, 1897.

WOLFF DRYER CO., Chicago, Ill.

Gentlemen:—Replying to your inquiry regarding dry house at our east end plant, will say, that it is two years since we equipped that yard. We found the earthy deposit there would make the best quality of stock brick; soft mud process, but would not stand direct heat drying; such as we were accustomed to use, therefore concluded to test this brick in your dryer, resulting in our installing your system, producing results of a most satisfactory nature, proving the excellence and correctness of your system of absorbing moisture from centre to surface by drawing a volume of warm air through the brick, carrying off the moisture and leaving our brick perfect and bone dry, saving us money in burning and producing beautiful color.

Six months experience proved to us that it would pay to install your system at our South side works, which we did one year ago, with equal satisfaction. At this yard, we have shale clay manufacturing soft mud and dry-press brick and was equipped with the best kind of dry floor, heat supplied from natural gas; we sacrificed this and built an Iron-Clad under the same roof. This loss has been our gain; the quality of brick and saving in cost of drying enables us to show a fair profit, which is very pleasing, considering prevailing low prices for brick. We dry all our dry-press brick before setting in the kiln.

Respectfully yours,

SANKEY BROTHERS.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

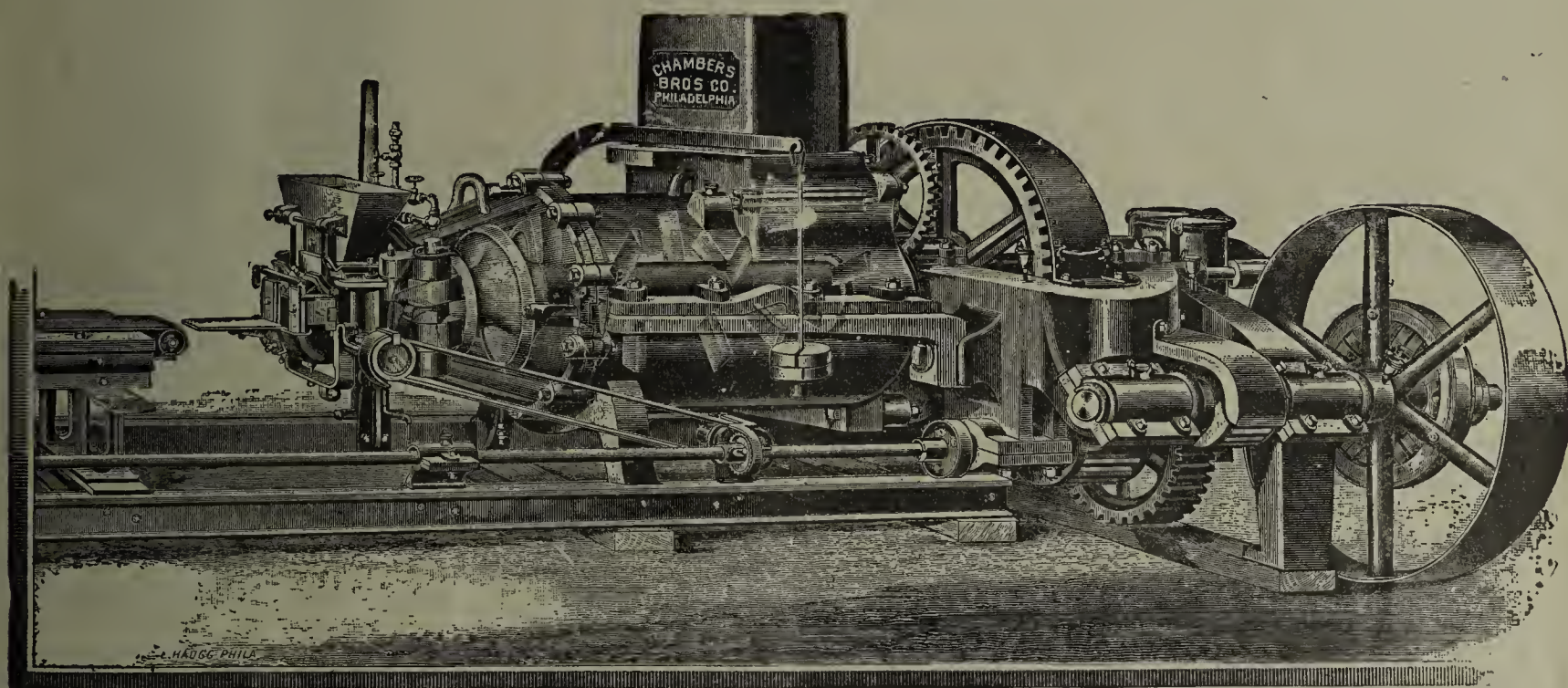
VOL. XXVIII, No. 2.

INDIANAPOLIS, IND., AUGUST, 1897.

\$2.00 a Year in Advance.

OUR SPECIALTY IS STIFF TEMPERED BRICK MAKING ...MACHINERY.

We aim to Build only the Best in its Class.
It has Paid our Customers to Buy and Use our Machines.
We Believe it would Pay You.



Chambers Brothers Company,

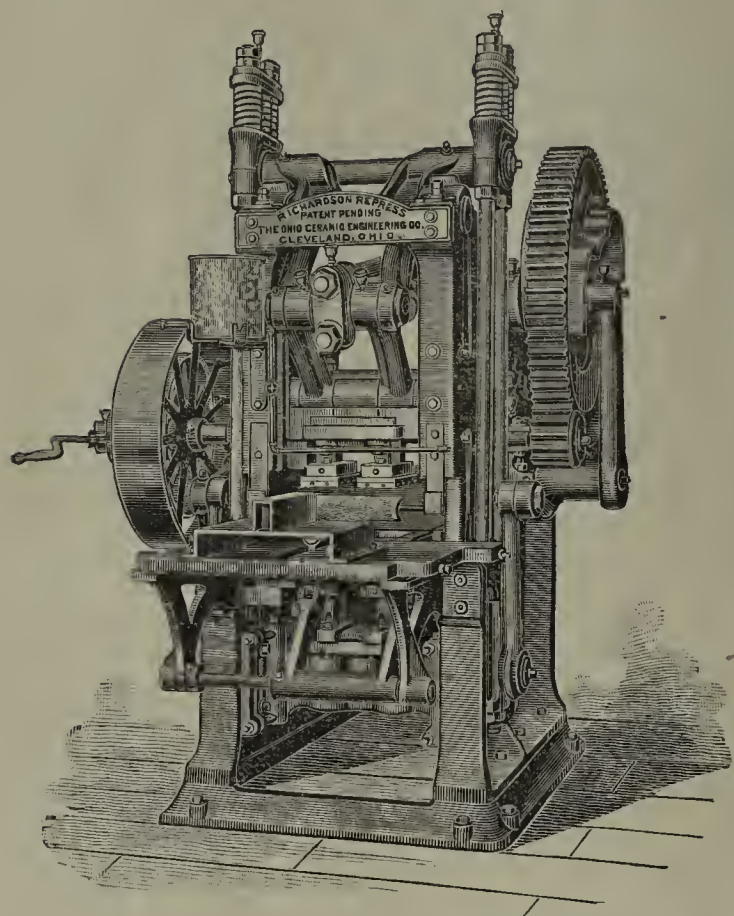
FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,

171 South Canal Street.

PHILADELPHIA, PA.

The Richardson Repress



Is not an Experiment
But an Established Success.

This statement is substantiated by our ever widening circle of patrons.

We claim for our Repress. Perfection of construction and operation; maximum of durability and output; minimum of cost and repairs.

Brick repressed on a "Richardson" earns an enviable reputation for the maker.

There is the whole story in a nutshell; what more can any reasonable brickmaker desire?

We shall be glad to give you all details.

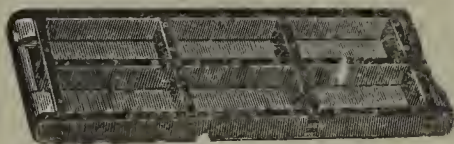
The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

Brick Moulds at a Discount.

On and after June 1st, you can get 20 per cent off the list on Machine Moulds and other supplies, at reduced prices. If you have not got the LIST, send for it. Address the largest and most complete works of the kind in the world.



3 Brick Hand Mold.



6 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

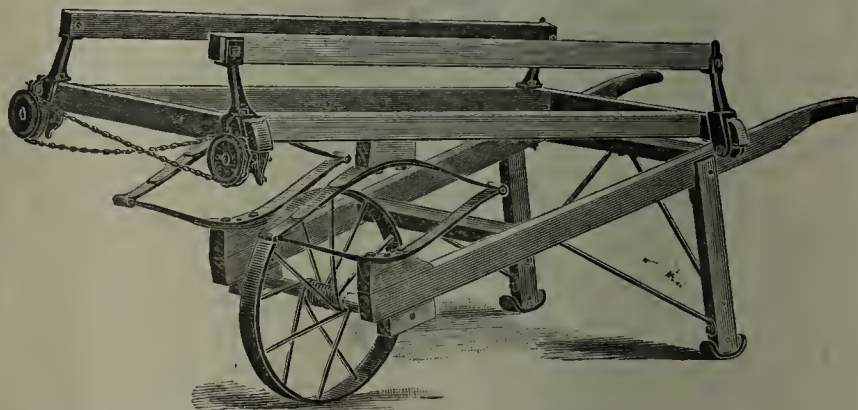
We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

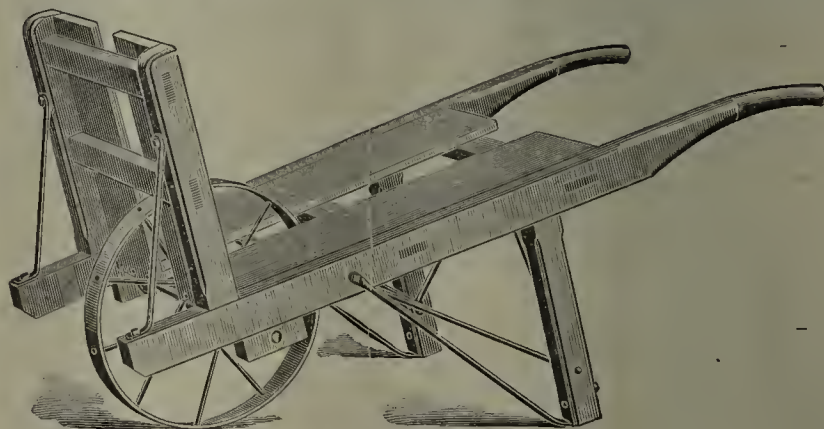
Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

Send for catalogue and price list. Address,
D. J. C. ARNOLD, New London, Ohio.

TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market.
BARROWS, For various purposes. Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind



No. 4 Brick Barrow.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.

IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

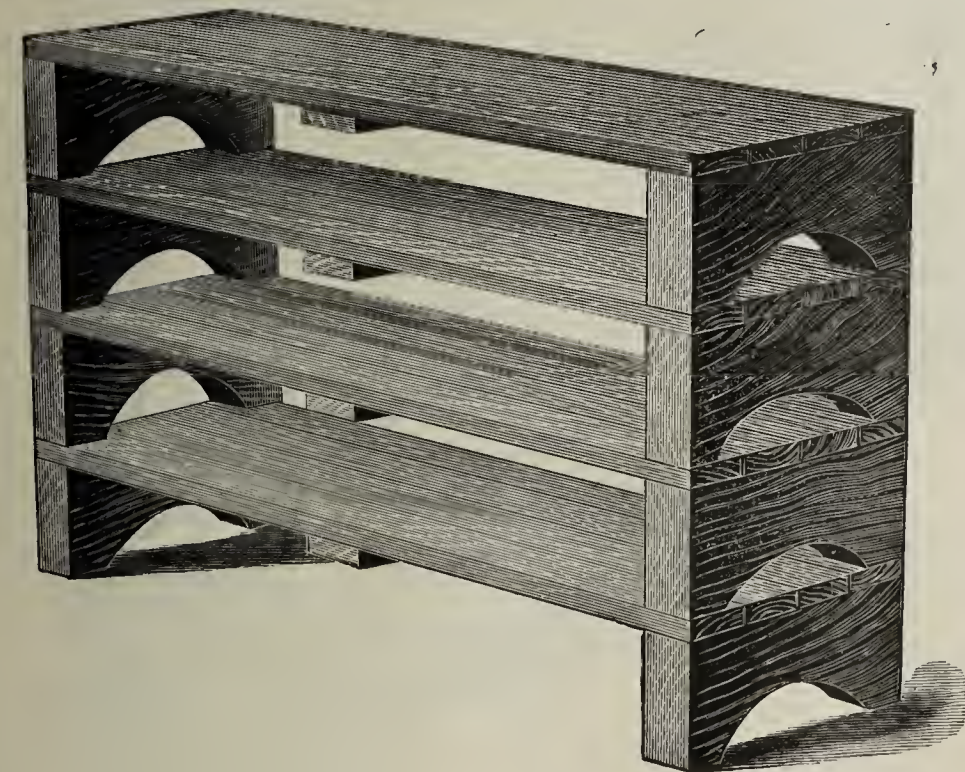
Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.



Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

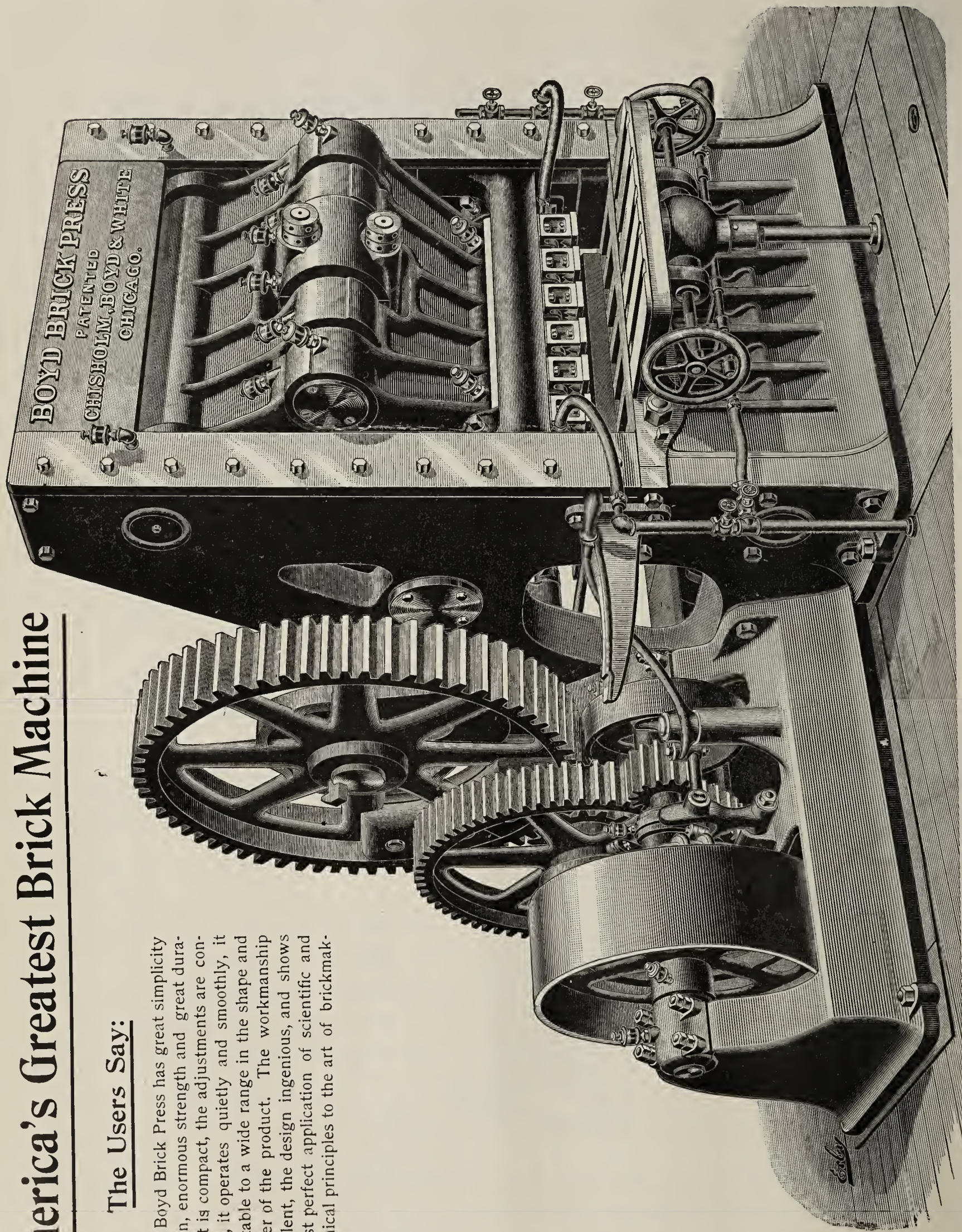
W. B. MERSHON & CO., - Saginaw, East Side, Mich.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."

THE CLAY-WORKER



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

"The Survival of the Fittest."

WE ARE IN THE BUSINESS TO STAY AND WILL NOT BE UNDERSOLD.

• • • •

CLAY WORKING MACHINERY

The Simpson Brick Press

The World's Standard.

• • • •

Used by all Successful Brick Yards Throughout the United States and Canada.

• • • •

We Manufacture a Complete Line of Clay Working Machinery.
Write for Catalogues.

• • • •

DO NOT EXPERIMENT.
INVEST YOUR MONEY IN A SURE THING.

• • • •

Complete Plants Constructed and Guaranteed.

• • • •

The Simpson Brick Press Co.,

Manufacturers and Contracting Engineers.

OFFICE AND WORKS: 

77th and Jackson Ave. (Formerly Storms Ave.)

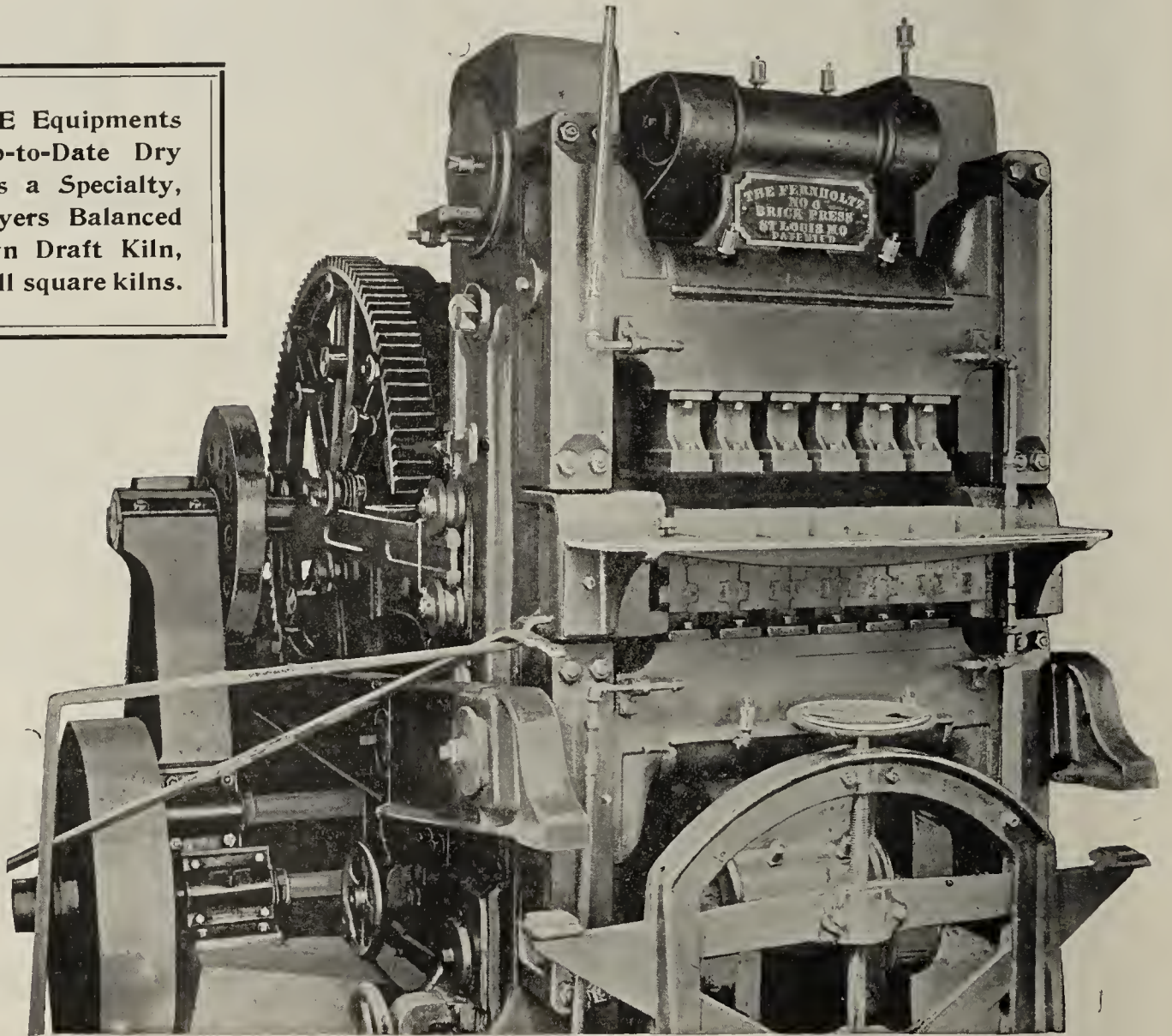
CHICAGO.

AGENTS FOR CANADA: WATEROUS ENGINE WORKS CO., Brantford, Ont.

The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMplete Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

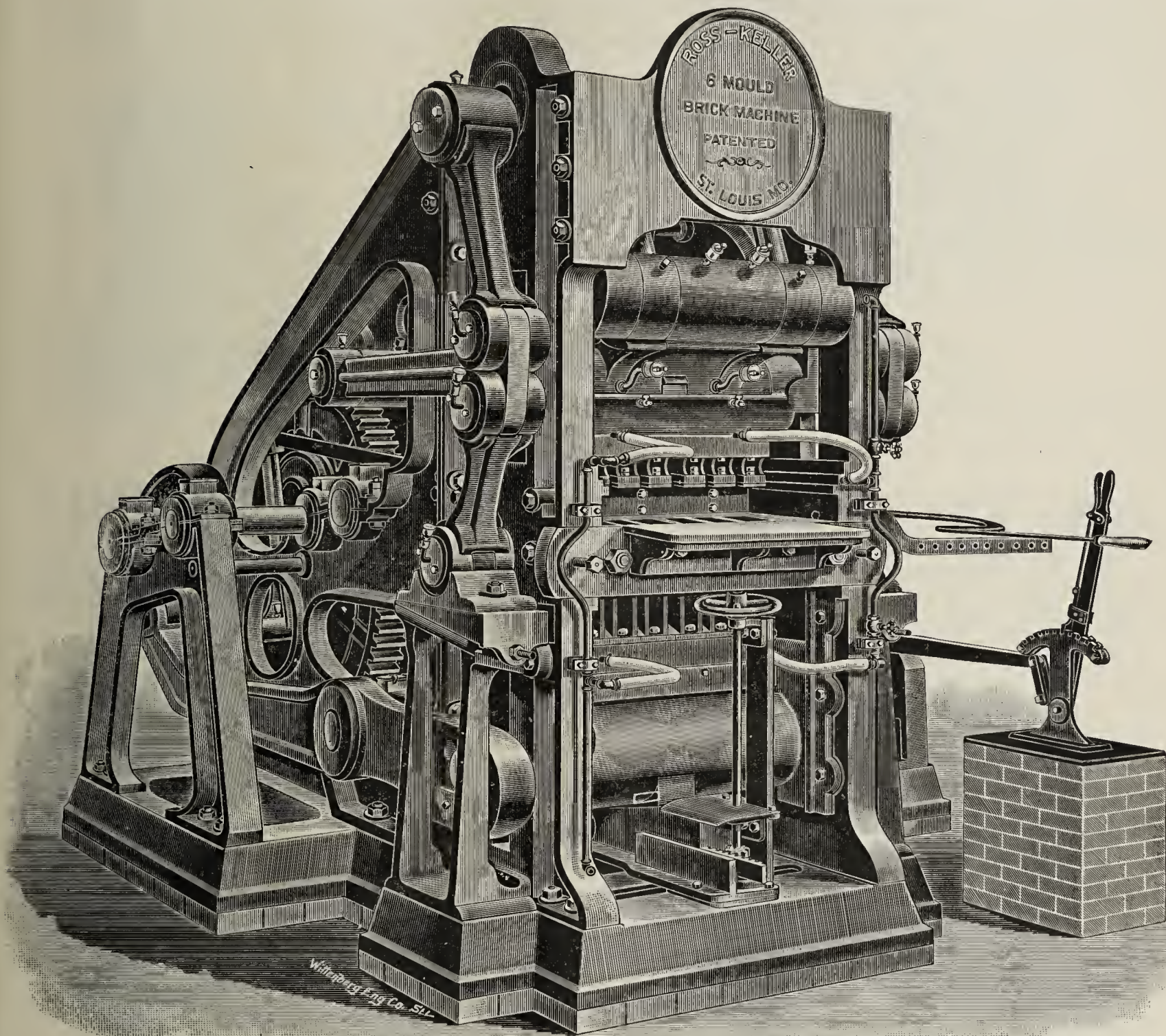
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

ST. LOUIS, MO., U. S. A.

"A Clay Pulverizer of Wonderful Capacity"

SO SAY ALL WHO HAVE USED IT.

St. Louis, June 4th, '97.

Messrs. MILTON F. WILLIAMS & CO., City.

Gentlemen:--You undoubtedly remember the difficulty you had in interesting us in your "Pulverizer."

We thank you for your persistency as it caused us to purchase one of your PULVERIZERS which has proved itself to be all you claimed for it.

It grinds our BURNT POT CLAY to our entire satisfaction and in a manner superior to any we have seen.

We cheerfully recommend your pulverizer to all who may have use for it.

Yours truly,

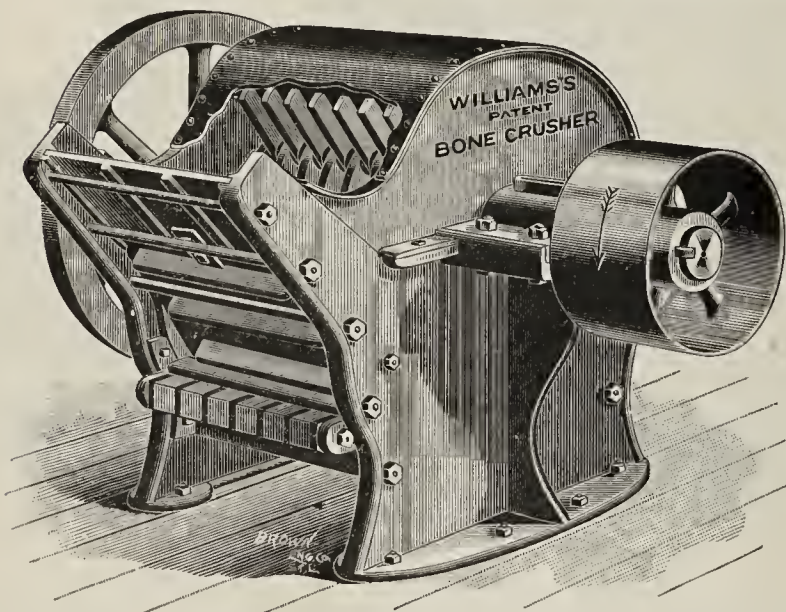
JAMEISON-FRENCH FIRE CLAY CO.,

E. E. French, Sec. and Treas.

We can send you many more like this.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

Our Pulverizer is fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.



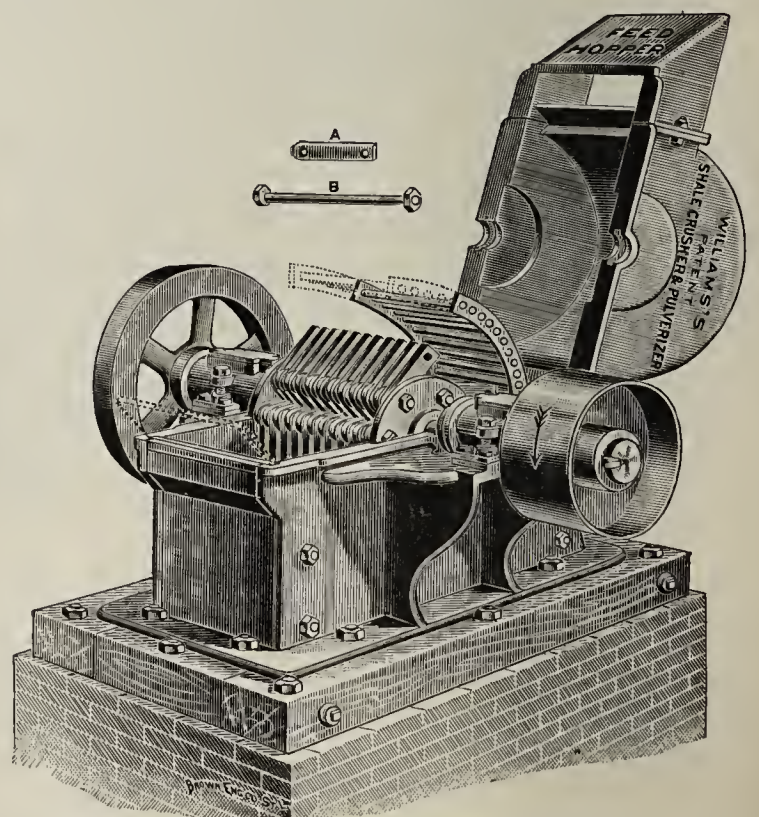
Williams's Shale Breaker.

THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

The Williams Patent Crusher and Pulverizer Co.

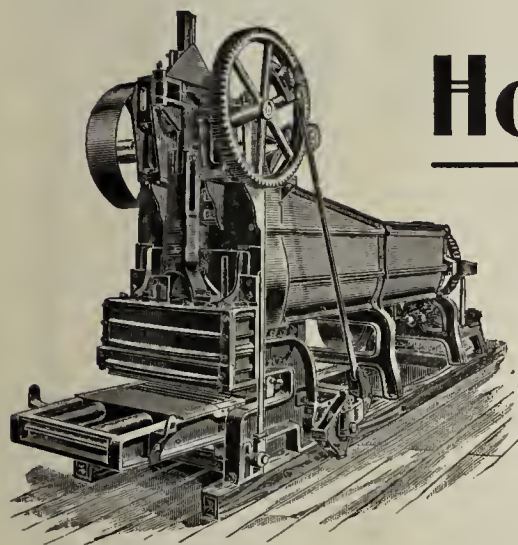
2705 North Broadway, - - St. Louis, Mo.



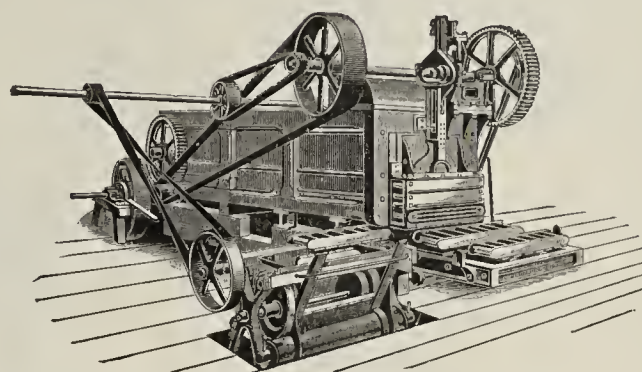
Williams's Shale and Clay Pulverizer.

With Clay Steamer Attached.

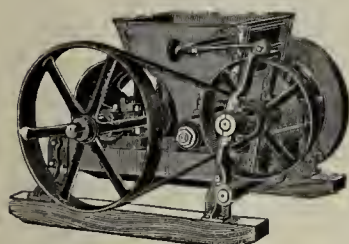
We Manufacture Anything You Need.



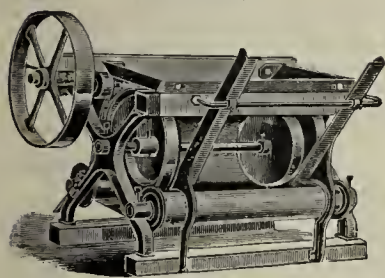
Horizontal Stock



Brick Machines,



(PATENTED.)



(PATENTED.)

*All Iron Vertical Machines,
Disintegrators, Mould Sanders,
Pug Mills for all purposes,
Granulators, Conveyors,
Cars, Winding Drums,
Brick Moulds (machine or hand,)
Trucks, Barrows,
Kiln Castings,
Pulleys and Shafting.*

We are prepared to furnish any of the above goods promptly at prices and terms which we know will satisfy you.

If in need of any supplies or Machinery it will pay you to write for prices and terms to

C. & A. POTTS & CO.,

420-428 West Washington St.,

INDIANAPOLIS, IND.



The Price

Of a thing is generally fixed by its worth.
Swamp land is cheaper than a fertile farm.

Clothes made of shoddy cost less than
garments made of wool.

This is because they are worth less.

It is one of the eternal impossibilities of
the world to buy good things at the price
of bad things.

The STANDARD IMPROVED BRICK AND TILE DRIER

Is not a cheap Drier in the sense of being sold at a cheap price. It is, nevertheless, the cheapest Drier on the face of the earth. It costs a little more than some in the beginning, but the real economy of it shows in the end.

It is intended for Brick and Tilemakers who want a Drier that can be adapted to most any kind of clay. It does its work just as well in the North as in the South—in the East as well as in the West.

The method of drying is continuous. **The Standard Drier** works all the time. It never gets tired, and, if treated right, repairing days are very rare.

It is simple—there is no unnecessary mechanism or complications about it to hinder and annoy. Any man with common intelligence can operate it.

It does its work right. It is economical with steam. It will dry your ware just as rapidly as the nature of your clay will permit.

We have a 124 page catalog, full of descriptions, illustrations and testimonials from every section of the country. This book is rather expensive and we do not care to waste a single copy. We will however, be pleased to mail one to each reader of the CLAY-WORKER who is interested enough to ask for one.

....

The Standard Dry Kiln Co.,

186 South Meridian St.,

INDIANAPOLIS, IND.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVIII.

INDIANAPOLIS, IND., AUGUST, 1897.

No. 2.

Written for the CLAY-WORKER.

MAKING BRICK BY DRY CLAY PROCESS.

THE FIRST IMPORTANT part to consider in the arrangement of a factory for making dry press brick is the location of the clay machinery. The feeders, disintegrator, elevators, screen and clay hoppers should be placed in a position easy to get at, to avoid any unnecessary difficulty in making repairs. The disintegrator should be set upon a good brick foundation, built to a height of three feet above floor level, and arrange to feed it with a screw or elevator feed, the screw being preferable, as it gives a more even feed. The conveying elevator that runs from the disintegrator to screen should be built in two perpendicular shafts, twelve inches square, inside measurement, with detachable doors at the bottom of each shaft for lacing belts or repairing cups. At the bottom of the elevator build a sliding door in the framework to use in cleaning out the clay that gets packed in around the bottom of elevator. The bottom should be cleaned out good every time the machinery is stopped for cleaning the disintegrator. The conveyor belt, if belt be used, should be ten inches wide and eight-ply, with nine-inch steel cups, put on twenty-two inches apart with bolts and iron straps. The best screen to use in making high grade brick is the gravity screen, 3-32 mesh or hole, set at an angle of 34 degrees. The screen should be built in two sections, the frame with screen plates attached, and clay slide. Make the screen adjustable for height, so it can be raised or lowered. The tailing chute

should be built three or four inches lower than the end of screen, and it will not stop up with chunks and tailings.

—Clay Bins.—

Clay bins should be built in the best manner, and built round if possible, the object being to keep the sacks full all the time. The bins ought to be built large enough to hold clay for making 1,500 brick. It is always advisable to keep the bins as near full as possible, for it makes considerable difference in the feed of the machine when the clay in the bins gets low.

—Speed of Machine.—

It does not make any difference what the capacity of your machine is; the one thing you should do is to make good brick. We have found the following rule a good one: If the machine has a capacity of 2,000 brick per hour, make 1,600, or four-fifths of the capacity. One of the most important things to make a success is a regular speed for the machine. If possible, have an engine to run the press and nothing else. The brick will always be the same in density and finish; press just as much clay in each brick as can be put in without checking. Each brick of standard size, when taken direct from machine, should weigh about six pounds fourteen ounces. Such a brick will weigh, when dried and burned, nearly six pounds.

—Handling Brick.—

Care should be taken in handling the green brick from the machine to the drier or kilns, as every good brick lost is so much less production. The most careful men on the yard



ADMINISTRATION BUILDING, NEW TENNESSEE PENITENTIARY, NEAR NASHVILLE. Built of Buff Brick from the Kilns of the Fizer Brick Co. See Brickyard Sketches.

should be in these positions. The machine man and the setter are the two men to make or mar the profits in the first stage of brickmaking. Nothing should go on the trucks or cars but first-class goods, and the same should be put in the kiln. The brick burner cannot burn new corners and edges on poor brick; more often he will burn them off from good ones. The setter should be a man with a conscience, so when his day's work is done he feels that he has earned something more than the amount of wages paid him by his employer. I have heard brick setters say that anything was good enough, but few employers will find that the case. Care should be taken to get each brick set square on the one below, so avoiding flashed edges and kiln marks on the faces. The best way to set in a down-draft kiln is eleven over four, two brick high to the course, with binders in the twelfth and twentieth courses from the floor, and always have the top course finish the narrow way of the kiln.

W. E. VORHES.

Written for the CLAY-WORKER.

HISTORICAL SKETCH OF THE PHOENIXVILLE (PA.) POTTERY.

BY EDWIN ATLEE BARBER.



OF CONSIDERABLE INTEREST to the ceramic student are the early potteries which were established in the United States shortly after the beginning of the late civil war. Of these, one of the most important is that which was established at Phoenixville, Pa., in the county of Chester, which is celebrated as being the early home of Bayard Taylor, Thomas Buchanan Read, Maj. Gen. Anthony Wayne, of the revolution, and other eminent men. A brief account of this establishment was given in "The Pottery and Porcelain of the United States." It is my purpose in these papers to present a more complete historical sketch of these works, in order that such facts as are yet procurable may be chronicled for the benefit of the future ceramic investigator and the historian. I have, through the courtesy of Col. Fred A. Tencote, who has been Secretary and Treasurer of the pottery company from May 12, 1879, to the present time, had access to the records, and am therefore enabled to give dates and names with some degree of accuracy.

On the 7th of May, 1867, the Phoenix Pottery, Kaolin and Fire Brick Company was organized by some gentlemen of Phoenixville, Pa., Rev. William Weaver being elected Chairman and Mr. W. A. H. Schreiber Secretary. The authorized capital was \$50,000. The certificate of incorporation was dated Sept. 13, 1867, the charter having been drawn up by Hon. Wayne MacVeagh, who was counsel for the company. Mr. George Sellers, of Phoenixville, was elected President of the new company and Nicholas Hack, a practical potter, was appointed foreman of the works. The first products were fire brick, yellow and Rockingham wares. Nothing was attempted at first in the way of ornamental work, but after a time a decorator, Mr. Reinard Ohle, commenced some experiments in ornamentation. Just what the character of these early attempts to beautify the ware were we do not know, but it is probable that he first used some of the old molds from foreign factories, which was the practice in other American potteries. The public did not demand original designs at that time, and perhaps could not have discriminated between new designs and reproductions of foreign work. Some copies of old Italian modeling have been found among the relics of the Phoenixville establishment, one being a relief head of Christ, another being a plate or plaque, seven inches in diameter, covered with relief medallions of scenes from the life of Christ, the nativity and crucifixion. These are said to have been prepared by William Vickers, an English modeler, but they could scarcely have been his own work. It is more probable that he brought the molds with

him from England, where, in turn, they may have been borrowed from an Italian artist.

Philip Pointon was appointed foreman of the Phoenix



Relief head of Christ, a Reproduction from the Antique.

works on Dec. 17, 1870, after which the products of the factory were greatly improved. Heads of boars, stags and dogs were among the designs modeled by John Stuffle. These were produced in terra cotta for wall ornamentation, and were made of life-size and colored after nature. There were many sizes of deer and hound heads, the antlers for the former being made separately and inserted after burning. These ornaments were very popular at one time, and were extensively used to decorate



Crucifixion Plate with Relief Medallions, a Reproduction from the Antique.

the walls of taverns and dwellings. They were, perhaps, the first objects of the kind made in this country.

In 1872 (Aug. 31) the Phoenixville works were leased to John E. Baum and W. A. H. Schreiber, but in less than two months the former retired and J. F. Betz took his place as spe-

cial partner in the firm. Mr. Schreiber was constantly conducting experiments in new bodies, and during his connection with the works many novelties were produced. He purchased the



Terra Cotta head of Boar.

stock of molds and models that had been used by the old American Porcelain Manufacturing Company, of Gloucester, N. J., which had discontinued operations about the year 1860, taking them to Phoenixville in a canal boat, with some of the machinery and other things. Among these were some good designs, which continued to be used for some time, but many were never utilized. Some of these molds, notably one for a clock case, are still to be seen in the surviving stock of the mold room at the Phoenixville works. If we could trace the history of all the early pieces of pottery and porcelain made in this country we would find that perhaps the majority of designs had originated elsewhere and had passed from one pottery to another, not a few having come from foreign factories.

Parian ware was first made at Phoenixville, under Mr. Schreiber's supervision. The fire brick kiln was utilized for this purpose, and the experiments were reasonably successful, as we shall see hereafter. Perhaps the first blue glazed pottery of American manufacture was produced during Mr. Schreiber's connection with the works. The ware was composed of a common white body, known as C. C. ware, covered with a mazarine blue glaze or enamel. At least two tea sets of this character were produced, which were presented to well-known public men, as examples of what the establishment was capable of turning out. One of these services was given to Hon. Washington Townsend, the then Congressman of the district.

For the Centennial Exposition a number of special designs were prepared, among them a large relief medallion of an Indian's head, after the design on the United States cent, which was applied as a decorative motive to the sides of vases and teapots.

David Smith was placed in charge of the factory on Feb. 11, 1876. Mr. Schreiber left the pottery about this time, and has since been engaged in mining fine porcelain clays at Webster, N. C.

On Jan. 1, 1877, the pottery was leased by L. B. Beerbower and Henry R. Griffen, the latter, who was still in college at the time, being represented by John Griffen, Trustee.

As has already been stated, parian ware was first made at Phoenixville during Mr. Schreiber's connection with the works. Among the molds which he purchased from the Gloucester, N. J., establishment were some which are said to have been made by a Mr. Peters, who did some modeling there, and a number of these were utilized in the manufacture of parian designs. Other special molds were prepared for lithophanes, or window and lamp-shade transparencies, then much in vogue. As is well known, the modeling of this class of work is quite difficult, since the relief parts and depressions must be so accurately calculated that the shadows formed by the rays of light passing through the varying thickness of the intaglio, semi-transparent parian will represent a finished picture in shades and lights. Many of these were made in Germany and other parts of Europe by experienced modelers, and were usually copies of famous paintings. Those made at Phoenixville do not seem to reveal any originality of conception or workmanship. They appear to be copies of foreign designs, probably reproduced by simply making plaster molds from the imported pieces, which were quite common thirty years ago. Mr. Schreiber informs me that he had some subjects prepared for lithophanes, amongst others being Christ crucified, the Madonna, Faust and Marguerite and Penn's treaty with the Indians. I have seen examples of all of these save the first, and have had the opportunity of comparing some of them with the original foreign designs. In every case the two are identical in modeling, but the Phoenixville molds were stamped with the words "Phoenix Pottery." These products were burned in the white heat of the fire brick kiln, in consequence of which they are usually warped, twisted, lumpy and blistered, and in these respects inferior to the imported. The Phoenix design of Penn's treaty with the Indians is so close a copy of the foreign (made originally from Benjamin West's great painting) that only by the name of the pottery impressed in the upper margin and the roughness of the surface can it be distinguished from the latter. It has been asserted that these parian transparencies were modeled by Williams Vickers, who was connected with the works in 1868, and others claim that Mr. Peters, of the Gloucester factory, made the designs, and it is quite possible that the molds were really prepared by one or the other, but surely neither could have been the designer or original modeler. Work of this high degree of artistic merit had, perhaps, never been done in this country before the Centennial Exposition.



Terra Cotta head of Hound.

They are, however, interesting relics of the early days of this important American pottery. There was probably no intention to deceive in thus reproducing foreign work. There was a demand for such things, and the moldmaker took the best that

was at hand, and prepared the molds for the manufacturers in much less time than would have been required to model something entirely new.

In the mold room of the Phoenixville works some of the plaster casts are still to be seen. Among the subjects of the



Indian's Head Ornament.

series, in addition to those already mentioned, are the following:

Christ and the Adulteress, The Descent from the Cross, head of female, Romeo and Juliet, Storm at Sea, Forest Scene, The Nativity, Fireside Scene.

Large and small pitchers and other articles were also made in parian, and Mr. Schreiber experimented in other bodies, and produced some good things in what he called "jasper" ware, and also in jet ware.

Mr. Henry R. Griffen left college in June of 1877, and at once commenced to take an active interest in the business. His partnership with Mr. Levi B. Beerbower continued only for two years, the latter selling out his interest on Jan. 1, 1879, on which date the lease of the pottery was assigned to Henry R. Griffen, George S. Griffen (his brother), David Smith and William Hill. Mr. Beerbower went to Elizabeth, N. J., and is now the proprietor of large pottery works at that place.

(To be continued.)

Written for the CLAY-WORKER.

THE NEW YORK MARKET—A WET SEASON.



IF THE BRICKMAKERS throughout the States have had the rainfall which has prevailed in this section during the month of July they will know how to sympathize with the bosses as well as the laborers on the yard. About half time has been made, and when one considers the low scale of wages, it must bear heavy on the man with a family. The single man pays \$4.50 per week board. Even if he makes full time, his pay is not large; when he makes but two days in a week he is in debt. One yard pays the men by the month, and boards them under that system.

It has always been the rule that when they could not work on account of the rain they would not charge them for their keep. If they were sick or loafed they were charged for their meals. This season the proprietor of the yard has charged them for their board during the wet days.

On the 17th of July there was a very severe rain and hail-storm, which caused the loss of 150,000 green brick on one yard, also considerable loss on all yards. Since that date it has

rained more or less each day. It looks as if the old legend of rain on St. Swithin's day meant a continuous rainfall for forty days would be a reality this year, as it rained on that day and has not missed a day since. The quantity of washed brick is very large. In May the output of brick was curtailed by wet weather. The manufacturers were encouraged by the shortage, hoping that the supply on hand this fall would be such that at least a five-dollar rate, if not better, would prevail. June was on her good behavior, with the result that a large number was turned out. July is behind the production of other years. Will it help the market? When the market report is compared, one will see that the help is in the buyer's favor, not the seller's. The market should be booming so far as the consumption of brick is concerned. The dull time in the New York market is May, as jobs of the previous year are about finished up and the contractors are getting ready for the new ones. As a result, the trade is dull for about a month.

There is no activity in the real estate line. Now and then, in the daily papers, you will see a great movement in the realty market; some large estate has bought a large tract of land and is going to improve at once. Delve in the matter among those who follow real estate exclusively, and the fact is made plain that the realty market is remarkably dull.

If the facts set forth by Mr. Jacobs in the last Clay-Worker would be acted upon by the majority of the manufacturers there would be more than "glory" in making brick—there would be lots of dollars made. As he says, the cutting of prices does not increase building. Certainly if brick are not low enough in the New York market to induce one to build—if that is the cause, or one of the causes—they who expect to build must want the brick given them. If the buyer was the maker, he would think he was giving them away.

—Loss of Life and Property.—

Some of your readers may have seen the account in the New York papers, and others accounts in their home papers copied



Henry R. Griffen, Phoenixville, Pa.

from reports, of the breaking of the dam on the mountain back of Dutchess Junction, resulting in the destruction of the boarding house and Timoney's brickyard. The place was spoken of as Timoneyville, in honor of Mr. Frank Timoney, Sr., the owner.

As some who read of the destruction of the yard no doubt knew Mr. Timoney, they will be under the impression that it was the yard which went by the name of "Mott" yard, which Mr.



Christ and the Adulteress—See page 96.

Timoney owns and occupies, but such is not the case. To the north of Mr. Timoney's yard there was quite a space of open ground, on which two yards were built by other parties. Mr. Timoney's son operated the one which was damaged most. There is no doubt that if the Hudson River Railroad were not so poor the damage to the yard would not have been so great. The culvert which lets the water from Mebsyingah brook pass into the Hudson river was at the south end of the property. In 1883 it was in poor condition from the freshets which rushed through it, as well as the wash from the Hudson river. When the road was going to repair it the parties who owned the property at that time requested the road to remove it further up the track so that the brook would have a straight flow to the river, and thereby avoid all danger of a washout. The reply of the officials of the road was that if the property owner would pay half the expense they would do it. I was present at the time when they said what they would do. That night it began to rain, and kept it up for three days, with the result that the brook was swollen (there was no dam on the stream at that time) very much, so that it swept the culvert away entirely. If recollection serves me right, it was not over fifteen feet wide. The railroad commenced at once to rebuild on the same spot. The body of water that must have come down from the bursting of the two dams, in addition to the stream, which was swollen by the heavy rains, can be well imagined by those who have been on the property. The loss of nine lives is to be deplored. Mr. Timoney's loss is estimated to be from \$1,500 to \$2,500, loss of green brick, shed and other parts of the plant.

—The Mott Yard,—

In the seventies, was a monument of buried hopes of making a fortune. It was a case of parties who knew nothing of the trade, a doctor by profession, and he fell into hands that skinned him. The yard was built to supply the Hudson River Railroad with brick when the Grand Central Depot was being

built. Dr. Mott was a relative of the Vanderbilts, so that he was all right on that score. When I say that the party spoken of in the last number was the one he employed to superintend the building of the yard, and to allow any one to build a yard as he did that one showed plainly that he was a fit subject to be taken in. As the intentions were to ship all brick by rail, of course the shed should have been parallel with the Hudson River Railroad, so that the cars could be run outside of the shed, or have the track under the shed along the side of the kiln. The yard was laid out to run north and south, and embankment for pits east and west, which brought the railroad track at the end of the shed and made it impossible to put a switch alongside the shed, and caused all brick that was loaded to be wheeled a long distance. To change the sheds so that he could get a switch in he threw the west end of the shed north, making it nearly a V-shape, cutting off his long west yard so that some of the truckers could not lay one hundred molds. Everything was put up in good order, as there was no scarcity of money. If a man intrusted to put up a plant would build it just opposite from the way it should be, what could be expected of him when he was ready to make brick? The upshot was a complete failure. No better clay could be found, but the quality of brick made would not pass inspection, and were condemned and thrown out, and Dr. Mott was reduced to poverty. No doubt there are many like cases in the country.

—Bonanza Times of the Past.—

Will they ever return? By that I mean the prices of 1869. The manufacturers seem to think that as a money maker the brick trade has seen its day. A living may be made by spells, but nothing more. As one looks backward twenty-eight years and compares the state of the trade, it does not seem possible that such prices were paid for leases as were then given. Prob-



Female Head, Window Transparency—See page 96.

ably your readers have no idea to what an extent men went to get in the business. I will give some of the prices paid.

The property in view was bought for \$23,000, was horse-power and all out of repair, and no clay on it, having been used up. (The present owner has taken many thousand dollars'

worth of clay out since.) The parties removed the old yard, and put up a well-equipped steam yard of four machines and took clay from other property which they owned. They made brick for three years, when they thought it best to lease the yard ad-



Faust and Marguerite—See page 96.

joining, the lease on which yard would expire in two years, when they proposed to move their yard and take the clay that was under it. The rent for the two years was to be 8 per cent. on the net returns, as they had to draw their clay and sand about a mile. After that, when the clay would be handy, the rent was to be 10 per cent. and the lease for ten years. There was no better located yard in Haverstraw, and a number were after it, but the money required to purchase the horses, carts and harness, as well as shed, machine, engine and all fixtures, was another matter. We will take the general estimate as to cost of fitting out a plant at that date as about \$5,000 to a machine, more or less. As there were five machines, we will put the outside figure at \$20,000. This would have been excessive, as the yard had been operated three years. Finally, the parties that leased it closed the bargain for \$41,000. When the transfer was drawn there was some hitch, and the deal was declared off. In a day or two the parties came together again and closed the bargain for \$39,500, a price that I do not think has been equaled in the country, one may say, for a lot of lumber and a few horses.

The men who purchased it were not brickmakers, but by close management they came through all right. That is, they put in ten years of hard labor, and, by good luck, the last two years were quite good ones, and they came out without loss, and no more. At the end of the lease the plant that cost them nearly \$40,000 was sold for \$6,500.

—An Error of Judgment—

Was made by the parties. A few years before they were offered a property with a covered yard and four machines, with steam power, just as well located as the one mentioned, and in the spring, with five arches of green brick up, for just half what they paid for the leased yard, and they would not take it. They did not have the "brick fever" at that time. Other parties bought it and cleared it the first year.

Here is another case, and peculiar at that. The party who owned the leased yard had sons, but instead of setting them up in the business, he leased it out for a term of years at a fixed sum per thousand. All fixtures went with the yard, to be kept in repair. It was only a two-machine yard. One year was sufficient to convince the owner that he had made a mistake, and he paid the party who had leased the yard \$8,000 to sur-

render the lease, which the party did, and then went up the Hudson and purchased a yard of his own.

—The Depreciation in Value—

Of brickyard property in ten years' time in this section is wonderful, and still there are no buyers. There is a fine three-machine yard here, with six tempering wheels, and in good order, that cost \$40,000 in 1887, and over \$5,000 more has been spent in improvements since. In fact, all the earnings of the yard went for improvements. The purchase price mortgage of \$15,000 is still on it, and the owner wants the holder of the mortgage to take it for its face, but he will not. This shows that, as compared with the high prices paid for the other two properties, when the brick business was brisk, now is the time to secure bargains. But every one is waiting for the turn of the tide, when the rates on all clay lands will be at a premium. It will be like the rush to Klondike on a small scale—pay more and get left in the end.

—How Is This for a Decision?—

Parties in Fishkill desired to build a yard on what is called Fishkill creek. The Hudson River Railroad has a trestle over the outlet. Years ago a small yard was located there, and the demand was made of the railroad officials to open the trestle so they could get the material in to erect the plant. Of course, the railroad officials refused. This was in 1894. Suit was begun for damage. It finally came to trial. The railroad company put brickmakers on the stand as witnesses as to what money had been made during the past three years. The judge's decision was that the plaintiff was "money in pocket" by the non-compliance of the railroad company to put in a draw bridge, as the evidence of the brickmakers all went to show that there had been a loss in brickmaking. Hence the decision in favor of the defendants.

—Death of W. H. Aldridge.—

Death has removed one of the brickmaking fraternity at Fishkill in the person of Mr. W. H. Aldridge, who dropped dead as he was walking along the street. He was the second son of Mr. Thomas Aldridge, who, many years ago, removed from Mud Hole, which was at that time the great brick center, to Fishkill, and who, at his death, left the finest clay property in



Storm at Sea—See page 96.

Dutchess Junction. Mr. W. H. Aldridge, with two of his brothers, formed a partnership about eighteen years ago. He was a member of the firm for about five years, when he sold out his interest in the firm for, I think, \$10,000. Like all others who have anything to do with brick, he was not contented. He

built another yard, which he sold out after running a few years. As his boys grew up he leased another site for a yard, and when the yard was completed he moved close to it so he could give the same his personal attention. A more whole-souled man than Mr. Aldridge would be hard to find. Many will miss him, for his hand was ever ready to help the needy, and in a way that was not known by the public. As a manufacturer he had clear, forcible ideas, which he always used to advantage in his business. As a father, friend and citizen he will be sadly missed.

—The Market.—

If we are to believe the reports, there is a slight improvement in all markets. How about brick? Like the business end of the wasp, it is getting to a fine point, and I am afraid, like that insect, it is stinging some of the manufacturers rather hard. Well, what are you going to do about it? A man makes brick, and then he wants money. He ships them, and then he cannot blame the other fellow for buying them as cheap as he can, which he does, of course, and will do until time is no



The Nativity—See page 96.

more. If the brickmaker will not try to help himself, who will help him? For example, when a manufacturer has shed room to put in at least fifty arches without shipping a brick, and the last cargo he sent to market was sold for \$4 per thousand, what can you expect? Possibly the wet weather may help the market; or will it still further depress it? To-day makes four days that not a wheel has been turned on any of the yards, and the fifteenth day of rain this month. Allee samce, if the masons cannot lay brick, the manufacturers can ship them, and do, and then growl that the market is so low.

New Jersey, ordinary.....	\$3.50 @4.50
New Jersey, good.....	4.12½@4.25
Lower Hudson, ordinary.....	3.85½@4.00
Lower Hudson, good.....	4.12½@4.25
Lower Hudson, fine.....	4.37½@4.50

A drop of about 25 cents per thousand in a month.

—Front Brick.—

Croton Point, brown, per thousand.....	\$11
Croton Point, dark red.....	12
Wilmington, dark red.....	19@20
Baltimore, dark red.....	35@42

Philadelphia, alongside pier.....	20@22
Trenton, alongside pier.....	18@20

Add \$3 for delivery of North River front brick and \$5 per thousand for delivery of Philadelphia, Trenton and Baltimore front brick.

A. N. OLDTIMER.

Hackensack, N. J.

Written for the CLAY-WORKER.

WATERSMOKING AND ITS EFFECT UPON THE BRICK.

THERE HAS BEEN a great deal of discussion over the whitewash (as some term it) on brick in watersmoking. Some say it is alkali, or lime, potash and soda. Now, if it is the alkali in the clay which causes it, why does it not show on every kiln made from the same clay? I have seen one kiln very badly whitewashed and the next kiln would be entirely free from it. Does this not show that the cause of whitewash on the brick is due a great deal to the manner in which it is watersmoked? Now, in an up-draft clamp kiln, unless careful in watersmoking, you will find whitewashed brick near the top of kiln, and very often near the middle, where the watersmoke hangs on the longest. If you will notice where there has been a cold or wet spot in the kiln, and the watersmoke hung on there longer than the balance, you will find whitewashed brick. Now, this goes to show that it is caused by improper drying off. You must have a good, free draft to carry the watersmoke off as fast as it is made; if it is allowed to lie in the kiln and boil and stew the brick, it just burns the alkali and condenses the watersmoke on the brick and collects the sulphur and gas from the fuel. There is no use in burning fuel in trying to watersmoke a kiln, and then have no draft or escape for the steam after it is taken out of the brick. Now, as I have said before, where you have an up-draft kiln, with platten on, before you set fire, go on the kiln and turn the platten up. I turn up every other brick in every other row and course of platten, and stand them on end right in their places so they can be easily turned down again. This makes the top of kiln very loose and open, and you can see the watersmoke boil up through every place a brick has been lifted. Where you have them all down flat the steam stops there and has to crowd all around over the kiln to find an escape, and by holding it down under the platten you whitewash the brick. In boiling meats or vegetables in a pot, you will find the cook keeps a lid on the pot to keep the strength and flavor that they contain from escaping. Well, this is just the way some brickmakers do; they keep the platten down tight while drying off, and hold all the defective properties which the clay may contain in the kiln, instead of letting them escape. There is very little use in keeping the doors or arches open to admit air when there is no escape for it. Open the platten and there will be a natural draft, without admitting very much air. In this way you can dry off much quicker with better results and less fuel, and you will find the top brick in kiln will not be blown and whitewashed by being soaked for three days in watersmoke. As fast as the watersmoke disappears turn the platten down; don't wait until the kiln is redhot on top, but as soon as the top course is hot and no watersmoke is visible then turn the platten down. Some say that is too hot a job. Well, if the platten is properly turned up it is a small job to turn it down. Let a man go on top with a spade and he can turn it down without any trouble if you don't wait until the kiln gets too hot. I believe in many cases where brick whitewash after being laid in the wall it is due to the drying off or watersmoking. The watersmoke has been burnt on them or stained them, yet not enough to show until exposed to the air, which brings out the defect. Now, if care is taken to give the kiln a good, free draft to carry off the watersmoke readily, fire slow at start, and just fire enough to follow the watersmoke up, I think there will be very little, if any, trouble about efflorescence appearing on the surface of the brick when burnt.

H. L. JACOBS.



WET WEATHER FOR QUAKER BRICKMAKERS.

FOR DOWNRIGHT soft, soggy traveling commend me to a brickyard and surroundings down in a hollow after a brief rainy spell of about twelve days, with an accompaniment of sunshine for ten minutes, and an interlude of rain like falling pitchforks for two solid hours, and the thermometer at 84 degrees Fahr. Verily, there's no humidity! Oh, no; not at all! No blue streak of passionate desires; nothing is felt but the soft, invidious clinging of the clay to your No. 9 heavy russets.

I met an old Teuton, who, in a voice tremulous with anger and tobacco juice, said:

"Sagen sie vonce, wo hin ken I git a class of pier mit a dung sandwich?"

I replied: "About three miles up the road."

"Ach! Got in heaven! Vot do you t'ink I'm made of?"

"Clay," I answered, and, truly, he looked it, for he had managed to slip down once, and his appearance was that of an unburnt statue.

After cavorting, slipping and sliding about, I found myself on the outskirts of the yard owned by Samuel Lloyd, with Walter S., his sturdy son, acting as yard boss over the eleven acres that constitute the hole (whole) in the intersection of Fifty-fourth street, between Arch and Race streets. This was first started about thirty-five years ago, and was at one time all under cover. But that was in the palmy days of '90. Since then the city has cut right through the center for a new road, building it up gradually, semi-annually, with two hundred loads of top soil dressing.

The first to greet me was Walter S. Lloyd, who, in good, round measures, ground out a list of complaints that would reach from here right into the Clay-Worker's office, condemning business, weather and surroundings.

"Here we've been working for thirty-five years, and I have never seen such times. Look at what the rains did. We had a million of those stretchers hacked out ready, and the rain flooded out the lower courses and the others are falling. Yesterday I put in a bid on sixty-four houses for hard, salmon and stretcher, and I put it in so low that there was only enough profit in it to get a suit of clothes, but I got knocked out. Somebody put in a lower figure and I got left. Oh, ham it! I tell yer there ain't nothing in the brick business any more."

Then I reflected on what I had gotten out of it, and, contemplating my boots and clothing, I failed to agree with him.

Here they usually run their Chambers end cut machine right up to its fullest capacity—60,000 daily—and eight hand gangs. The main trouble is, the clay has given out and they are compelled to haul every load they require, and ye brickmakers know what that means—when your orders are in and your clay is out. Three Dutch up-draft kilns, with a capacity, respectively, of 210,000, 200,000 and 90,000, stand west, down in the hollow, six feet below the level of the newly made road, and the machine shed and drying lap sheds are located in the same

way on the east side. Sizing this all up, it did not require much keenness of perception to see that the entire situation was bad. Just then the whistle gave the signal for grub time, and it was not till after Mr. Lloyd had toyed with his pancreatic secretion that I managed to get a snap shot of him as he viewed the yard in a more complacent mood from the rail in front of the office.

—Jolly John Sullivan's Yard.—

About half a mile east as the fish swim, for there's no other way of going except by balloon, I came across the above yard in a manner quite creditable to a representative of the Clay-



Walter S. Lloyd and Office—Jno. Sullivan's Plant Mr. S. in foreground—End of Sullivan's Kiln shed.

Worker. After leaving the water, and taking advantage of the men being at dinner, I took possession of the machine shed and put on all my clothing so as to inspire the owner with the belief that I always went about in that condition. I scuttled over to the office, where I found hearty John Sullivan, with his hands full of bread and mouth well filled with huckleberry pie.

According to John Sullivan's statement, he started in 1877, a year that started a business revival and some prosperity for the Quaker City. At that period his surroundings were verily of a bucolic nature. A line of street cars to his place was unthought of, and the hauling of brick was a torture for the horses over the rough and heavy road. Six hand gangs sufficed to turn two million annually. To-day, as will be seen from our illustration, a row of houses and a thirty-foot road runs along the line of his plant. In 1885 he put in a Chambers end cut machine of 45-horse-power and one 75-horse-power boiler, and, with four hand gangs, worked along steadily, turning hard salmon at \$5, stretcher at \$10, sewer hard at \$6.50 and \$7.50, and in 1886 turned out and sold 6,000,000.

In 1895, finding the clay working weak, Mr. Sullivan took out the Chambers and replaced it by a Monarch of 45-horse-power and a new boiler of 75-horse-power, and was content to turn out 35,000 daily. At present, while not complaining of business, Sullivan is on the lookout for a new location. In the meantime he would be willing to dispose of his Chambers machine, as he will have to close up by the end of the year.

Reports of Webster & Co., Flood, Milnamow and Dingee are not very encouraging. Stagnation along the line, due to the lovely weather, under baneful meteorological influences, has much to do with it, I guess. Business is opening up slowly, and large operations are favored for the fall.

At the Equitable Brick Company's Plant, Sixty-third and Lombard streets, Robert Moss, one of the teamsters, was internally injured by the falling of one of the clay banks, crushing the poor fellow against the wheels of his cart. Last reports, however, seemed more favorable for his recovery, and I trust he will be able to pull through.

W. P. LOCKINGTON.

Written for the CLAY-WORKER.

THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Fourth Paper.

BY E. G. DURANT.



SINCE WE ARE discussing the development of the building block industry, it may not be uninteresting to clayworkers if we weave in a bit of our experience as we go along, giving the "why" and the "how" as various features embodied in the blocks are brought out. The rationale of the methods employed may perhaps be thus shown more clearly than in any other way.

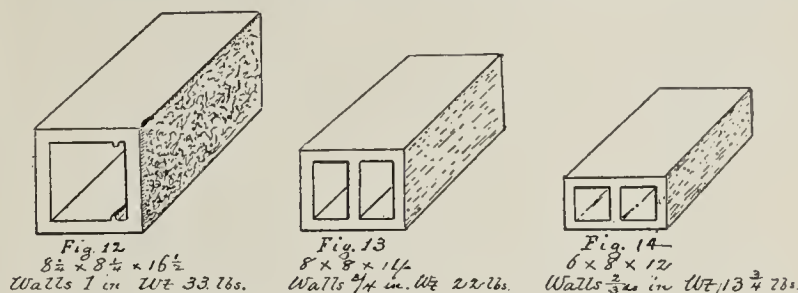
The question is often asked why $8\frac{1}{4} \times 16\frac{1}{2}$ inches of block face has been fixed upon as a standard by manufacturers of ornamental blocks. Several reasons may be given. The first, and perhaps the least important, is that the parties who first took up its manufacture were eastern Ohio workers of plastic fire clays. They had been accustomed to make plain blocks of these dimensions of face, and naturally ordered ornamenting dies to match their plain dies. Workers of alluvial clays have ordinarily manufactured blocks of smaller size, and have generally confined themselves to producing blocks with double chambers. The most common sizes, we believe, are those shown in cuts No. 13 and No. 14, our own block, such as are ordinarily used in single course walls of not more than two stories, numbered 12, being placed beside them to aid in making our comparisons of the several blocks more intelligible.

Allow us to make our own block the standard of comparison. The number of cubic inches in No. 12 is 1,124; the number of cubic inches in No. 13 is 672; the number of cubic inches in No.

14 is 384. We may state that a fair average production of the No. 12 blocks is 400 per hour, or 4,000 for a ten-hour day, and on this basis we present a tabulated statement showing the number of blocks required to be made of the other sizes to make the equivalent in bulk, and also the weight of clay required for this equivalent:

No.	Size.	Day's work or equivalent.	Weight each, lbs.	Gross weight, tons.
12	$8\frac{1}{4} \times 8\frac{1}{4} \times 16\frac{1}{2}$	4,000	33	66
13	$6 \times 8 \times 14$	6,690	22	73 1180-2000
14	$4 \times 8 \times 12$	11,708	$13\frac{3}{4}$	80 985-2000

These figures tell us very plainly that there is economy in labor, and also in material, in making the No. 12 block, as against the other sizes. It is quite certain that the same force of men cannot handle 6,690 blocks in a day, though smaller, that can handle the 4,000—says about two-thirds more in num-



ber and weighing $7\frac{1}{2}$ tons more—and it is certain that the nearly three times as many blocks that are required of the No. 14 cannot be handled without nearly double the force, requiring, as they will, even more care in setting, and this applies to drying, to kiln setting and clearing, and all subsequent handlings, including the laying in wall, and also double the mortar.

The addition of $14\frac{1}{2}$ tons of material, or about 20 per cent. more than is demanded by the No. 12, is vital, levying an assessment, as it must, on every operation from clay bank to the block in the wall, and often including heavy freight charges.

To us it is quite evident that such blocks must cost 50 per cent. more than the No. 12, bulk for bulk, when finally located in a building.

The question arises, What advantages, if any, have the smaller sizes to compensate for the added cost?

We think the makers of these blocks will be ready to present two reasons for favoring them:

First—Better adapted to ordinary structures; not as clumsy looking as the No. 12 for such use.

Second—Greater compressive strength in the three short walls, bound together, as they are, at short intervals, than in the two longer though heavier walls of No. 12 block, and better weather protection.

Answering the first objection, we admit that until we began to break up the face of the larger blocks they were not pleasant to the eye in small structures, but when this was done, and each block was made to represent any desired number and shape of blocks, the "clumsy" argument lost its point. Let the reader refer to the elevations of the dwelling shown in the last number of our articles in the Clay-Worker, where broken ashler blocks are shown, drawn to scale, and he will concede that proper designs are a perfect cure for what was objectionable in cases. But we hear some thinking man saying: "The blocks, being of different shade, lighter or darker, according to burn, will make evident the full size of each block when in the wall." A little later in this paper, under its proper head, we will show how this has been answered in practice.

—On the Other Hand, We Claim—

That large sized blocks lend themselves more readily than the smaller to the carrying out of ornamental designs. This is evidenced in the work of hand-made terra cotta manufacturers.

Answering the second objection, from all the data we have been able to collect—and we have been diligent investigators—we have not found a single fact to corroborate such an assump-

tion, and we suggest that the objection should be considered invalid until some data is presented to substantiate it. As to the three narrow joints being better weather protection than the two broad ones, we have no data save that experience says that the narrower the joint the more likely to be imperfect and the easier to dislodge the mortar, but we need not argue this, since the "lap joint," already described in these papers, insures a good joint.

Before dismissing this branch of the subject, other advantages inhering to the production of the larger blocks may be mentioned, and first as advantages to the manufacturer. A much larger per cent. of perfectly formed blocks may be had of the No. 12 block than of the other sizes referred to, because the larger base insures a more perfect setting in the kiln (the blocks being set on end, the only proper way of setting to secure blocks true in shape and of uniform burn), and also because less liable to injury in handling to dry room and in and out of kilns.

Second—A more acceptable block, commercially, because stronger against blows when in wall and less liable to shatter in transportation or from careless handling.

In concluding this discussion of size we desire to present a proposition for the consideration of any interested readers.

—Here It Is:—

An ornamental hollow building block may, as a rule, both on the score of economy in production and its value in use, be made as large as can be comfortably, safely and conveniently handled, both in process of manufacture and in laying; and, so made, if properly proportioned, made of suitable clays and well manufactured, such block will have ample crushing strength in every case where a like thickness of brick wall is admissible.

In referring to a "standard" block, as we have done in this paper, we simply mean to be understood as referring to a block $8\frac{1}{4} \times 8\frac{1}{4} \times 16\frac{1}{2}$ inches, which was the initial block in this movement, and the one most commonly used in ordinary one and two-story structures. Under the head of "Building Construction" we propose to present various blocks, all of them "standard" for the use for which they were designed.

—Some Experiences.—

In the early days of our interest in building blocks we had but one thought, and that was to make comely and attractive what had until then been generally deemed rude and unattractive. Then the use of building blocks for exterior purposes was confined almost exclusively to foundations, factory buildings and barns, and we had in mind but one form of block, and that a plain rectangular one. Corner blocks were made by mitering two such blocks, and then pasting them together, and this was the beginning and end of the chapter.

It soon became evident that the ornamentation of a single plain flat surface was to constitute but a beginning, and that molded blocks must play an important part and many new structural forms must be added if the industry be made to assume any importance in competition with the production of other building material.

In the last fifteen years we have seen the gradual evolution of the brick industry. It has exchanged the humble place it occupied, until it now holds its position among the arts, and no mean place at that. Emerging as it did from its swaddling clothes, mainly of one cut and color, it now has its many suits—repressed, dry pressed, molded, ornamented, mottled and Roman, with others unmentioned. The suggestion of a brickyard fifteen years ago brought to most persons the vision of a horse-power pug mill, low, rambling sheds, bricks drying in the open, a clamp kiln or two, a clay bank or pit, and little else, while to-day well-appointed factories, towering stacks and permanent kilns represent hundreds of thousands of dollars in single plants.

It was seen that as great a change must be wrought in the block business. The single ornamenting roll applied to the face of a rectangular block was but the "A" of a full alphabet,

and constructive forms and combinations must follow as words and sentences follow letters.

—The Four Principal Steps Were:—

First—The ornamenting roll.

Second—The molded form.

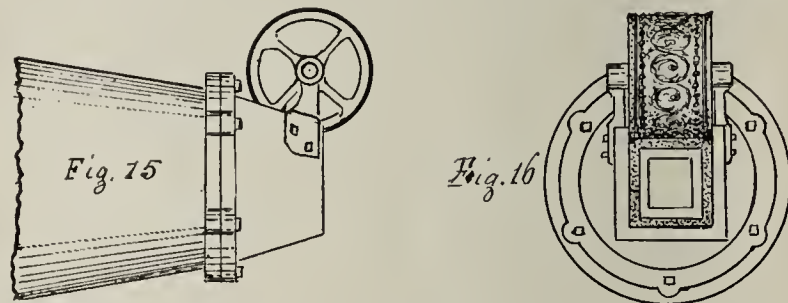
Third—The combination of the two, including color and finish.

Fourth—The whole field of structural forms, many of them embodying features not found in any other material.

Having definite ideas of what ought to be accomplished, the main question, after all, was how to do it.

Let us follow a few of the steps taken as they occurred, illustrating with simple sketches to bring more clearly before the minds of interested readers.

Fig. 15 is a side view and Fig. 16 an end view of an ornamenting roll in position on the forming die of an auger machine.



Originally the diameter of the roll was such that one revolution measured the length of a block, but it was found that sharply cut and bolder designs would require larger diameter of rolls, and the circumference of the roll must be such as to complete two or more blocks in one revolution, the smaller rolls still being used for designs with little depth of figure.

In Fig. 17 a window-easing die is shown. This die is made double, producing two casings at the same time, the designs being different each from the other. Two reasons may be given for working these blocks double—first, in order to balance the clay mass that it might be dried and burned without warping, each casing holding the other in shape, and the two presenting a broad base for setting in kiln. After burning, the center section, "A," is broken out, being scored properly by the dies to insure such practice.

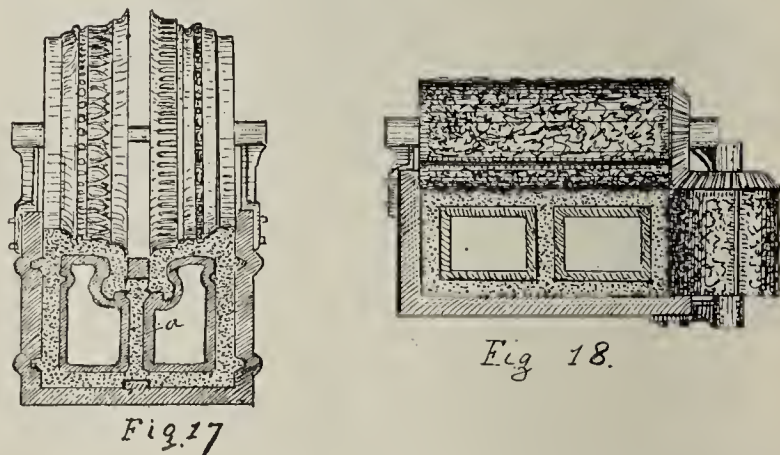


Fig. 18 is a front view of a corner block die and ornamenting rolls in position. It will be noticed that the rolls are geared together by miter gears on their inner end, that the travel of the two may be in unison, so that the joint may occur at exactly the same point on each face. This, too, is the outgrowth of experience. When corner blocks were first made two wall blocks were, as has been stated, first cut to a miter, then pasted, because the ornamenting of two faces of a vertical chambered block had not been undertaken. The first ornamented corner block dies had no gears to cause them to move in unison, and were only suited to broken rock faces, that could be cut at any point, but as soon as margins and tooled edges appeared the miter gears became a necessity.

These examples will serve to illustrate the general princi-

ples attending the construction of ornamenting dies. Of course, there are many details not touched upon which experience has found to be essential to their successful working. It will be noticed that the rolls do their work upon the clay while it is still retained within the outer walls of the die and while the clay is still supported by the walls of the core. In this way only could the blocks be embossed without being pressed out of shape.

—Color Treatment.—

In due time it was found very desirable to introduce color treatment. In most cases the clayworker has but one variety of clay from which to produce his wares. How to secure variety in shade or color without too much cost from bringing in foreign clays, which, when had, might vary in shrinkage and require different treatment both in preparation and burning, was the question. The great value of a difference in shade, if not in color, will be readily understood when the production of sills, lintels, belt courses and other trimming blocks are taken in hand.

The oxide of iron—nature's main dependence in this field—was first resorted to in treating a clay that was buff when burned. It was not thought necessary to more than tint the face of trimming blocks, and so save the considerable expense attending coloring the entire body of clay treated. In the outset the iron oxide was mixed into a thin slush of the clay (slushed with water), made of such consistency as was thought desirable to apply by the use of a felt-covered roll to the face of the revolving ornamenting die, as ink is applied to type. A trial was made, with astonishing results, but not such as we sought. This slush, pressed into the face of the block, became a bond to unite the two, and when the roll parted with the block which it was operating upon it took all the embossed portion with it, leaving a ragged and unsightly face—"just what might have been expected," afterthought said.

The next trial saw mineral oil used as a substitute for water. Surely it would prevent the paste clinging to the roll, and so it did, but a color blotched surface presented itself. It was expected, by taking the color on the raised parts of the roll, that it would be deposited in the background of the figure and so bring the figure out in relief against a colored background, but the color, in varying quantity, was carried everywhere by the oil, and "blotches" was the net result, in a word.

Glycerine, or its equivalent, vaseline, was next resorted to, because it would not "run." The result was a decided improvement, but such compounding material is expensive for such use, and, besides, a slicked finish, which was not entirely disposed of by burning, did not satisfy.

A happy thought occurred at this juncture. A dark red paving brick was reduced to powder and sprinkled upon the roll from a coarse bag as it revolved. The moisture of the clay which was imparted to the roll was sufficient to retain the dry powder, and when the block was burned, while it parted with a part of the powder on its face, that pressed into the background was retained, because of the more perfect incorporation with the parts under greatest pressure. The result was what had been sought.

Besides securing a very satisfactory result in ornamentation, another and important improvement was included: The dry powder took the place of a mineral oil lubricant, previously deemed to be necessary to prevent the clay from adhering to the roll. Such treatment with oil sometimes left whitish spots on the wares, and every finger mark on unglazed blocks could be distinctly seen, besides which, a slicked surface was not satisfactory. The handworker in terra cotta has a method of securing a uniform color and a fine grained surface upon his product by spraying it with a slush of clay or grit of the color or tone of color desired. This is done when the wares are drying—an aftertreatment. The use of the dry powder sprinkled upon the ornamenting roll in the one process of forming and ornamenting the wares insures the machine-block maker an equally satisfactory result. The burned clay deposited on the face, having once passed through the fire, is not affected as is an unburned clay face by exposure to a greater or less heat, and the blocks so treated—particularly if care is taken to powder them with material that has already sustained a greater heat—may be relied upon as very uniform in color or shade, and this furnishes the promised answer to an objection noted under the discussion concerning full size of blocks showing in wall despite the breaking up of the face by ashler or other design.

Parties having a red clay product may, by the use of powdered quartz, such as is found in the market, or in the use of light-colored brick ground in dry pan or otherwise, convert their red clay into a red sandstone in appearance, and, on the other hand, the buff-clay worker may secure the same effect by using freely a powder of very dark red or brown brick. Coarse ground oxide of iron or black oxide of manganese, both easily and cheaply had, work admirably for a mottling material. These are thrown out as mere suggestions.

MAKING PRESS BRICK IN UTAH.



VERY SELDOM have I seen anything in the Clay-Worker about the brick interests in this part of the country, and think a good many of your readers, Mr. Editor, will be surprised when I tell them that we have here what we think is one of the best press brick plants in the country.

—The Works of the Salt Lake Pressed Brick Company—

Are located at Mill Creek, six miles east of Salt Lake City, and were established in 1891. The clay is of fine texture, plastic, and comparatively free from foul matter, and is worked to a depth of twelve feet. It is mined with plow and scraper by working bank on slant from top to bottom, thereby getting it to machine as near as possible the same as the formation at bank. The cars are placed under a dump chute and filled, then drawn by horse to shed and dumped into a large receptacle holding sufficient material for 50,000 brick, using the clay direct from bank for the common brick. For the finer grades of facing brick the clay is selected and harvested separate, and



Jno. P. Cahoon, President Salt Lake Pressed Brick Co.

allowed to season before using. Beneath the dump bin at shed runs a conveyor, which delivers the clay to a pulverizer, and is then elevated to a height of forty-five feet and passes over screens of varied mesh, twenty feet long and thirty inches wide, which puts the material in the condition of bolted meal, and from this condition all their facing and common brick are made, excepting the liner quality of shale. The shale is mined from the mountain, seven miles distant, and hauled to the works by team. It passes through an extra heavy nine-foot dry pan and back over a set of screens to a seasoning pit to receive the proper moisture, and allowed to sweat until ready to mold, when it again passes over another set of screens to presses. The shale is of a dark red color and makes an excellent brick, uniform in color and without flash. Their bank clay gives all the varied colors of the rainbow, and, with proper selection at the bank, they can produce any color desired, and by working the bank full face they get an excellent common brick.

The machinery consists of two four-mold Boyd presses, one

Fate-Gunsaulus "A" stiff mud machine, with ten-foot pug mill and side board delivery cutting table, having a capacity of 60,000 brick in ten hours; one nine-foot Chisholm, Boyd & White dry pan, one forty-four-inch Steadman pulverizer, all of which they rate as first-class machinery. Their power consists of a 60-horse-power engine and a 50-horse-power electric motor, for which the energy is received from an outside corporation. Their daily capacity is 100,000 brick, but the output is regulated by market demand.

For burning they have a Boencke patent continuous kiln, with sixteen-foot-wide tunnel and eighteen chambers, which is now working satisfactorily; also three Kassler kilns, of 50,000 capacity each, for the finer wares, and other kilns, of up and down-draft of their own conception. The only fuel used is coal. In lump it costs \$4.60 per ton; slack coal, \$2.85 per ton. Common labor is \$1.50 a day; skilled, from \$2 to \$3 per day, all rated at that by the output per thousand each day.

The average price for common brick, delivered at building is about \$5.50 per thousand; select, of the various shades, from \$8 to \$15 per thousand; the shale, from \$15 to \$25. All brick are delivered to building by team, a five to seven-mile haul.

VITRIFIED BRICK—THEIR MANUFACTURE AND ADVANTAGES AS A PAVING MATERIAL.*

BY J. W. SIBLEY.

IT WOULD, PERHAPS, be well to state at the outset that the term "vitrified" is not used here in its primitive sense—meaning of the nature of glass or glassy, which carries with it the idea of brittleness, a characteristic not permissible in a genuinely vitrified brick. By vitrification is meant the perfect blending of the constituents into a homogeneous mass, and thoroughly annealed, so as to obtain the maximum degree of hardness and toughness, together with the minimum tendency to absorption of water.

Vitrified bricks have been made from shales, bastard fire clays and pipe clays. We shall consider only those made of shale, as they have proved the most satisfactory, and our experience has been mainly along that line.

Shale, as its name implies, is a hard clay, or rock, that shells off into layers or cubes when mined or exposed to the action



The Salt Lake Pressed Brick Co. East side.

Twelve brickyards are depending on this market, and the demand is very moderate. All are patiently awaiting the promised return of prosperity, which seems to have been side-tracked for a time.

The officers of the company are well-known business men in this section. J. P. Cahoon is President, Geo. Curley Vice President, W. S. Simkins Treasurer and G. E. Ford Secretary, any of whom will extend a cordial welcome to any reader of the Clay-Worker who may happen in this noted city, and a visit to the works will bear me out in the statement that they have one of the best planned and managed plants to be found anywhere in the land.

A HELPER.

PENNSYLVANIA'S CLAY DEPOSITS.

Prof. T. Hopkins, of the School of Mines of State College, is making an exhaustive research into the clay resources of western Pennsylvania. He will locate clay deposits, determine their value and uses to which they can be applied, and his report will be published in book form for general distribution. Such a report will be of great value in economic geology.

of the elements. It lies in strata from four to seventy-five feet in thickness, and is usually found above the coal measures. Its main components are silica, alumina and iron. The alumina fluxes at a lower temperature than the others in burning, and consequently acts as a binder to unite those very hard elements in the brick. The shale is mined after the usual manner of a rock quarry, blasted with dynamite, loaded into tram cars and conveyed to the stock or grinding shed. It is there fed into heavy crushers, or dry pans, where it is rapidly reduced to powder of such fineness as the nature of the case demands. The ground clay is then carried to the top story of the factory by means of a cup and chain elevator, and passed over a shaking screen, where all the coarser particles are removed and returned to the dry pan in the form of tailings to be reground. The fine clay then falls into a chute and is delivered to the pug mill, or tempering box, where the proper amount of water is added, and the revolving knives cut the mud up and temper same,

*Read before the Alabama Industrial and Scientific Society, 1897.

passing it automatically to another chute, where it is conveyed to the mouth of the brick machine on the ground floor. Here there are more knives to give additional pugging, and then the clay is taken by an auger and pressed through the die, emerging in a stream or column, which is forced out upon the cutting table, where wires, separated at equal distances, cut the column into blocks (or gluts, as better known to clayworkers). A traveling belt conveys the gluts to the repress, where they are dropped into molds and heavy pressure is put upon them, corners are rounded and lettering stamped upon them. Another traveling belt takes them from the repress and they are placed upon wooden pallets upon iron cars and taken to the dry-house, where they are cooked or baked by hot air until the moisture is removed. Then they are set in patented down-draft kilns, and burned and annealed as desired. After having been thoroughly burned, they have to be cooled slowly, so as to be tempered to the maximum degree of hardness. The entire process from the shale pit to the railroad car occupies some sixteen days for a kiln of brick.

For a long time granite or Belgian blocks were considered the only successful pavement, and they have had the one characteristic of durability to recommend them. But they soon be-

is dusty in dry weather and sloppy in wet. It can be said to be good and wear well only when covered by a foot of snow.

In vitrified brick the civil engineer finds just what he is looking for. The combined silica, alumina and iron give a resultant material that is harder than steel. It is the only substance that will successfully resist the calks and heels of the horse's shoe—that greatest enemy to all pavements. When brick are properly manufactured and thoroughly vitrified the blacksmith will be kept busy sharpening the chisels on the calks and heels of the horseshoe. And when, in the process of time, the brick do wear, it will be uniform all over the brick, so that the pavement will present a smooth surface, even when the brick are worn half away. Of course, if a poor or improper foundation is put under any pavement, it will not stand the traffic on account of unevenness.

Vitrified brick, being non-absorbent and uniform in size, when laid present an absolutely water-tight pavement, which is easily cleaned by washing or sweeping, thus affording the best sanitary pavement yet discovered.

Brick paving can be easily repaired, when repairs are necessary, on account of uniformity of size. Brick pavements are comparatively noiseless, and less slippery than either granite



The Salt Lake Pressed Brick Co.

come polished and slippery, and after five or six years' traffic the corners become rounded off, and the pavement is as rough as cobble stones, as is the case with part of First avenue, in this city. The noise on granite pavements is, perhaps, the greatest objection. The pavement is uneven, consequently the wheels of vehicles passing over same receive constant blows. Some astute mathematician has figured it out that in one year of travel over granite pavements a buggy will have dropped in distance equal to a mile and a quarter. Our brethren of the "wheel" are no doubt prepared to feelingly corroborate this statement. The blocks being irregular in size, the interstices are larger, and consequently become reservoirs for filth and excrement from horses, a serious objection from a sanitary standpoint.

Asphalt has a beautiful appearance to recommend it, but is very slippery and hard upon horses, because of no cushion to give it spring or elasticity; in summer very hot, and dust intolerable; most costly of all pavements, and short-lived.

Macadam is good for country roads, and has cheap first cost to recommend it to some cities, but requires constant repairs;

or asphalt. They have been in successful use in Holland for one hundred years, and in this country, at Charleston, W. Va., without any repairs, for twenty-five years; in Columbus, O., Galesburg, Ill., Omaha and other cities, for ten to fifteen years, and are now the standard pavement for Chicago, Cincinnati, Cleveland, St. Louis, New Orleans, Atlanta (the home of granite), and our own Montgomery, Ala. Many other cities North and South are adopting vitrified brick for paving their streets.

There are several interesting and instructive tests for determining the value of a brick for paving purposes, notably the rattler or abrasion test, the compression test, the absorption test.

In the abrasion test the bricks are put in a foundry rattler, together with 300 pounds of scrap iron, and revolved for 2,000 revolutions. They are weighed before and after taking. The percentage of loss is said to equal twenty-five years' wear in the street. In such test, Alabama brick lost 10 per cent., granite 8 per cent.; other brick lost 12 to 15 per cent.

In the compression test, Alabama brick stood 265,000 pounds before breaking. This is equal to the weight of the heaviest

locomotive piled in a vertical column on one brick.

In the absorption test, after immersion for seven days, Alabama brick absorbed .22 per cent. of its weight. The average common brick will absorb 10 to 15 per cent.

Paving brick have burned up a highly tempered drill in attempting to bore through them. Jefferson county, in addition to its vast mineral resources, furnishes the material for the manufacture of paving brick that have surpassed in all tests.

Written for the CLAY-WORKER.

THE POTTER'S ART.—No. 3.

BY W. P. JERVIS.

THE GREEN WARE is now ready to stand its first test of firing, but before going in the oven it is placed in rough clay boxes, known as saggars. These are of different sizes and shapes, and are used to protect the ware from dust and smoke. The filling of these saggars is called placing. Plates, saucers and other flat pieces are placed on a bed of white sand and sand is sprinkled round the edges. Some pieces are entirely imbedded in sand, to insure them retaining their shape. Small articles are placed in the large ones, economy of space being an important consideration. When the sagger is full a roll of clay is placed round the top, it is fixed in position in the oven, another one is placed on the top of it and the process repeated, until the bung, as it is termed, reaches to the crown of the oven. These ovens are tall, circular towers, from forty to fifty feet high, and fourteen to sixteen feet inside diameter at the bottom. For about half their height the walls rise perpendicularly, when they taper off, leaving an opening at the top of about four feet. Inside the oven, at about the height of fifteen feet, is a dome or crown, with suitable openings, to allow the escape of smoke and dust. Entrance to the oven is through a door in the side, and the walls are pierced at intervals with small holes, through which the fireman can withdraw small test pieces placed in the oven for that purpose. The outside is strengthened with stout iron bands, to give strength to the walls and enable them to withstand the great heat to which they will soon be subjected. Below the floor of the oven are the furnace openings, connected with flues built under the floor, and against the inside walls in such a manner as best to give an equal distribution of heat. Where natural gas is used as a fuel, it is practicable to make a floor above the furnace openings and level with that of the oven, so that the placer can walk directly inside, instead of having to ascend several steps with his heavy load, a great economy of time and energy both in placing and drawing. The inside of the oven having been completely filled with bungs of saggars, the doorway is bricked up and plastered with clay, the fires are lighted and the test of the skill of the potter has commenced. About forty-eight hours are required to complete the



A Roman Kiln.

and is ready either for the decorator, if any underglaze decoration is to be applied, or to receive its coating of glaze. This is the hardest fire test that earthenware has to undergo. Hard



A Cutter.

porcelain can scarcely be said to reach a biscuit state, and before glazing is not nearly so heavily fired as earthenware. The ovens in France, therefore, differ materially from ours, being built in two stories. The lower section, and, consequently, the hottest one, is used for the glazed ware, while the superfluous heat that escapes to the upper chamber is all that is required for the green ware. Practically the body and glaze are fired together.

During this biscuit firing considerable shrinkage in the ware takes place, one body shrinking more than another, but experience has taught the potter the approximate shrinkage he may expect, with a given heat, and, providing the fire has been uniformly distributed throughout the oven, the result is a general uniformity of sizes. Some pieces, especially figures, require props to support some parts of them during the firing, and these props must be made of the same material, so that the shrinkage may be equal and the props retain their position. The delicate lace work sometimes seen on parian figures is made by dipping a piece of real lace into slip and then draping it on the figure. The fire burns the fabric away and leaves a genuine ceramic lace. Many remains of Roman kilns have been found in England, and of one of these we give an illustration. A biscuit oven requires for the complete firing nearly 27,000 pounds of selected bituminous coal, and the temperature attained is about 2,300 degrees Fahrenheit, a little above the melting point of cast iron. But of the heat generated under the present system of intermittent firing, it is calculated that only about 11 per cent. is actually utilized to heat the contents of the oven, 60 per cent. being lost up the chimney, the remainder being lost by radiation, excess of cold air, and imperfect combustion of the fuel. Having successfully passed its crucial test, let us follow the manufacture of a piece of ware destined to receive a printed decoration, and for which colors specially prepared to stand the heat of the next firing must be used. Of these the most popular is blue, prepared from oxide of cobalt. All pottery colors are prepared from metallic oxides, but the bulk of them are use-

firing, and about the same length of time for the oven and ware to gradually cool sufficiently to enable it to be handled, or drawn, as it is termed. The ware is now in the biscuit state,

less for underglaze decorations, as they fuze at a lower heat than the glaze. The principal underglaze colors are blue from cobalt, brown from iron and manganese and green from chrome. Recently the Charles Field Haviland factory has added many

the design. But the oil, useful so far, is now an impediment, as the glaze which is to protect and render the design practically imperishable, would not adhere to the printed parts, so the ware is sent to be fired in the "hardening on" kiln, just sufficient

heat being employed to destroy the oil. The ware is now ready for glazing. When and by whom glazing was first employed is one of the unsolved problems of ceramic history. Both the Greeks and Romans used it, and they probably derived it from the Assyrians. Glaze is made by fusing sand with potash or soda and combining it with lead. This is the ordinary glaze of the common earthenware, and is known as plumbiferous glaze. If to this oxide of tin is added it converts it into an opaque or stanniferous enamel. This is

used in the case of the early Rhodian ware, in the early Italian faience, which they termed majoliea, and in the later French faience, to conceal the coarseness of the body, and to present an even surface to the decorator. For English china borax or boracic acid is added, and it is then termed boracic glaze. For the old Sevres pate tendre, lithage, sand, calcined flint and the carbonates of soda and potash were used. The glaze of Chinese and all hard



Pate-sur-Pate Placque by L. Solon.

others, so that it is now possible to secure underglaze decorations in delicate tints. Blues from cobalt were first used at Meissen, in 1720, but it was not until many years afterwards that the beautiful shades for which that factory is celebrated were perfected. Cobalt had been found in Germany two hundred years previously, but its use could not be determined, and it was regarded by chemists as an altogether useless product. It is now difficult to conceive how a modern potter could dispense with it, its uses in pottery being so multifarious.

The art of printing on pottery is often credited as a Worcester discovery, but the evidence seems against it, the credit evidently belonging to Sadler, of Liverpool. It is possible that Dr. Walls' discovery was an independent one; it is certain that it was in use in Liverpool before it was at Worcester. The Worcester people, to preserve the secret, sent their wares to Caughley to be printed; from necessity Wedgwood and other Staffordshire manufacturers sent theirs to Sadler's, of Liverpool. The Sevres authorities proudly claim that they have never used the printing process, though I have seen much more effective artistic results produced by printing than some of the monstrosities manufactured at Sevres under the guise or disguise of art. I have, however, seen a complete Sevres service, made early in this century—I think it bore the 1820 mark—with a large portion of the decoration undeniably printed in gold.

The designs for printed patterns are made on copper plates, not differing materially, except in strength, from those used for printing on paper, only that the design is not made in reverse. Some services require separate engravings for each different article, and this is especially true of geometrical borders, which must fit and join together with great nicety. It will readily be seen that the border for a large dish would be useless for a cup, but in the case of a pattern consisting of sprays of flowers irregularly placed, a much fewer number of engraved plates are required. A high temperature is necessary in the preparation of the transfer prints, and both the copper plate and the mineral color must be quite warm. Having thoroughly cleaned the plate and charged it with color, the printer places it on his press and takes from it impressions on a thin, tough paper, which he hands to an assistant, generally a girl, called a cutter. With a pair of shears she deftly snips away the superfluous paper from around the pattern and hands it to the transferrer, who places it on the ware in the position it is to occupy. With a roll of flannel it is rubbed firmly and smoothly in its place and the porous biscuit body quickly absorbs the color from the transfer print. The paper is next washed off with water, and, as the color has been mixed with oil, the water does not blur or affect



Toft Dish, the Prototype of the Modern Pate-sur-Pate.

porcelain is chiefly felspar. It is important that the chemical properties of the glaze are in perfect accord with those of the body, as, if they are not in perfect agreement, disaster of one kind or another, such as crazing or the glaze peeling off the edges, of the ware, is sure to result. Where borax enters into the composition of a glaze, it is necessary to first "frit" it. The

required amount is taken and mixed with certain proportions of china clay and spar, is packed in saggars and melted down in the kiln. This first is then pulverized with other ingredients and ground with water. After being strained through a fine silk lawn it is ready for the glazer or dipper. Taking a piece of ware, he dexterously dips it in a tub of glaze, and the absorbent biscuit surface retains sufficient to give it an even coating over the whole of the surface. This glaze is now to be fired. The glost kiln, as it is called, is similar to the one already described. About 1,000 to 1,500 dozen pieces can be fired in a biscuit or glost kiln, according to the nature of the goods manufactured. An oven holds about 1,500 saggars. The ware is placed in saggars and the pieces are protected from contact with each other by small pieces of pottery called stilts and spurs. Pins made of pottery, about two inches long, fixed in holes made for them in the saggars, are also used, and are so placed that a plate or saucer will rest on three of them. Ralph Shaw, of Burslem, early in the eighteenth century, invented in a modified form these stilts and spurs. Larger pieces rest firmly on the bottom of the saggars, which for this firing are coated with glaze inside. The top edge is washed with flint mixture to prevent them sticking together during the firing. This firing occupies from twenty-five to thirty hours, and, in the case of printed ware, is the final manufacturing operation, though it has still to go through the hands of the sorter, who chips away with an iron tool any small pieces that may have adhered to it in the oven; to the warehouseman, who examines it carefully and rejects imperfect pieces, and finally to the packer before it reaches the dealer and through him to the public. If the ware is simply glazed, or it is necessary to add colors to the printed decoration, it is taken to the artist to paint on it what his fancy dictates, or to the enameling shops to be "filled in." Girls usually do this latter work. Taking a printed plate or other article, she looks at the copy she has to follow, and with a camel's hair pencil applies first one color and then another until the design is worked out. Being merely the filling in of an outline, it resolves itself mainly into dexterity, and does not call for any artistic training. The gilding is added at the same time. This enameling, or filling in process, seems at the moment likely to be superseded by the decalcomonic process, which has been successfully used on hard porcelain for several years. The ware is then fired again in what is termed the enamel kiln, or mouffle, for six or seven hours. This kiln is so constructed that the fire cannot come into direct contact with the ware, and, therefore, only clay firebats or shelves are required to place the ware on, the employment of sealed saggars not being necessary.

An artist on pottery works exactly the same as one in oils or water color, the first corresponding pretty nearly to underglaze, the second to the glaze painting, only that he is under the great disadvantage of not being able to see the exact color scheme he has in mind, as the colors develop considerably in the firing. When a tint is wanted to cover the surface, the piece is covered with a thin coating of oil. On this, finely powdered color is carefully dusted, giving an evenness impossible to secure with the brush. This is called groundlaying.

Reverting a moment to the process of printing, it can be done either on or under the glaze, the latter process giving a larger variety of colors. There are a few other processes, not entering into the manufacture of staple goods, and which could not be included in a consecutive account of the potter's art, but we make brief mention of them here.

Graffito decorations have been used in nearly all ages. A decoration is effected by covering a light clay with a dark enamel, or a dark clay with a white slip or glaze, and then scratching away portions of the top, so that the body below furnishes a contrast and makes the design.

Pate-sur-pate, that is, clay upon clay, consists in the use of a transparent white clay upon a dark body in place of color. It is a combination of modeling and painting, and was fully described by Mr. L. Solon, who is its chief exponent, in "Rough

Notes on Pottery," to which the reader is referred, and from which we give an illustration.

This is but the higher form of the old slip painting, and, as it is interesting to compare what the nineteenth century has evolved from its prototype of the seventeenth, we also give an illustration of a slip dish, by Toft, making the progress shown apparent at a glance. Of the same class is the beautiful Rookwood pottery, so well known for its originality and richness. The liquid clay is in this case first stained with color. Similar in process are the fine pieces now being produced by the Edwin Bennett Pottery Company, Baltimore, who in their selection of decorations are striking out quite an original line, and in which they have succeeded in producing some remarkably brilliant colors. The designs are principally Eastern scenes. These may



Vase from the Bennet Studio.

really all be termed pate-sur-pate, though each varies widely from the other in important particulars, but neither to Sevres, where the process was first revived, nor to Rookwood, who furnished a distinctly American pottery, nor yet to the later efforts of the Bennett factory, can the claim of originality, as far as the process is concerned, be awarded, as the Chinese, long before its inception at Sevres, successfully produced it. To make the series complete, we give an illustration of a vase from the Bennett studios.

Bisque parian flowers are made, petal by petal, leaf by leaf, and joined together by means of slip. To watch a flower maker at work, the process seems easy enough. On the contrary, it requires long practice and careful manipulation. The Sevres and old Derby flowers were marvelous in their fidelity to nature.

Written for the CLAY-WORKER.

SEGER CONES.

METHODS EMPLOYED till now for measuring the temperatures which lie above dark red heat and reach up as high as the melting point of platinum are mostly useless to the manufacturer who is not acquainted with physical technology. For this reason Prof. Dr. Seger, induced by Dr. Heintz, has made for the ceramic industry a number of silicates of alumina which have the shape of a three-sided truncated pyramid, and, melting one after the other, enable the observer to draw a conclusion as to the degree of temperature reached.

Seger's cones represent a number of systematically composed silicates, increasing in refractory power, and are applicable not for a single fixed case, but always and under all circumstances, for observing the progress of the heat in the kilns of the clay industry. They are composed of those constituents which generally serve for the making of porcelain glazes—that is, of feldspar, carbonate of lime, quartz and kaolin, in an almost chemically pure state. The most easily fusible mixture which can be prepared with the aid of these raw materials corresponds to the molecular formula: $0.3 K_2Ox$ $0.7 CaO-0.5 Al_2 O_3, 4 Si O_2$.

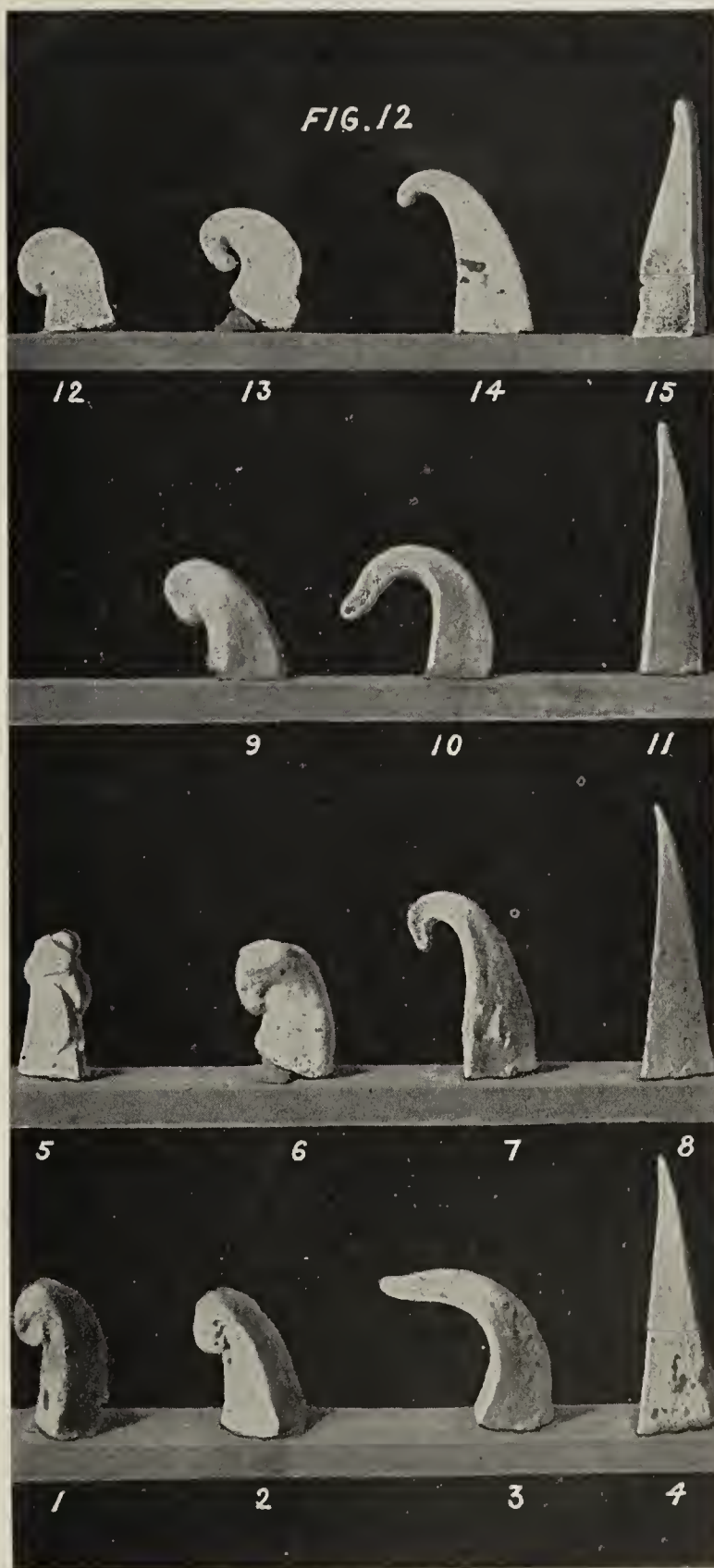
This glaze mixture has, according to its molecular proportion of silicic acid, been given the number 4; the lower fusing glazes, Nos. 3, 2 and 1, have been made by substituting 0.05, 0.1 and 0.2 molecules of alumina by 0.05, 0.1 and 0.2 molecules of peroxide of iron, and those which are more difficult to fuse by increasing the proportion of alumina and silicic acid. In order to render the proportions as simple as possible, this relation, starting from glaze No. 5, in which the proportion of silicic acid stands to that of alumina in the molecular proportion of 10 to 1, has been retained.

The lowest fusing glaze mixture, No. 1, thus obtained fuses at the same temperature with an alloy of 90 gold, 10 platinum, i. e., at about 1150 degrees C. In practice, however, much lower temperatures have to be considered. E. Cramer therefore introduced boracic acid into Seger's most fusible mixture, and thereby obtained cones which went down as low as the melting point of silver (950 degrees C). Dr. Hecht then prepared cone mixtures out of a borate-silicate of alkali and lead and increasing quantities of kaolin. These compositions begin to melt at dark red heat already. The accompanying table gives the number of the cones, the chemical composition and estimated melting temperature, although it may be more correct to limit the statement of temperature by saying: Cone No. 022 melts at dark red heat; cone No. 010 at about the melting heat of silver; cone No. 1 at the melting point of an alloy 90 gold, 10 platinum; cone No. 10 goes down at the melting point of potash-feldspar; the melting point of cone No. 36 is about the same as that of platinum, and the remaining cones range according to their numbers, yet the statement of approximately estimated numerical value, according to degrees Celsius, may meet the wishes of some manufacturers.

Taking as a basis a number of temperatures fixed with the Le Chatelier thermo element, and at the same time observing the melting of the cones and the melting points of the alloys and metals previously referred to, the corresponding values in degrees Celsius were fixed for the most easily fusible cone and for the one most difficult to fuse, and for the cones No. 010 and No. 1, assuming equal intervals of temperature. For the remaining numbers the other cones were arranged according to their number. This method can only give a limited idea, and cannot warrant absolute accuracy for the different de-

grees of temperature. According to the length of time, which again depends on the burning process and the size of the space to be heated, the values of the melting points of the cones, stated in degrees Celsius, must be relative or fluctuating, because the pyrotechnical processes which cause the melting of the cones to take place slower or quicker, according to the existing absolute temperature.

As, according to new careful observations made by various experts, especially according to the extensive experiments



made by the Physikalisch-technische Reichsanstalt, the melting point of platinum has been found to lie near 1800 degrees C., and that of nickel near 1500 degrees, the melting points of the cones were partly lowered and the intervals from cone 022 to 010 were assumed to be 30 degrees, and those of the cones from 011 to 36 to be 20 degrees each. This brings the melting temperature for cone No. 20 to 1530 degrees and that of cone

36 to 1850. These values agree with the melting points of the cones in so far as cone 20 fuses rather more difficultly than pure nickel melting at 1500 degrees.

Cone Number.	Chemical Composition.				Estim'ed Temp., Degrees Celsius.
022	0.5 Na ₂ O		2 SiO ₂		590
	0.5 PbO		1 B ₂ O ₃		
021	0.5 Na ₂ O	0.1 Al ₂ O ₃	2.2 SiO ₂		620
	0.5 PbO		1 B ₂ O ₃		
020	0.5 Na ₂ O	0.2 Al ₂ O ₃	2.4 SiO ₂		650
	0.5 PbO		1 B ₂ O ₃		
019	0.5 Na ₂ O	0.3 Al ₂ O ₃	2.6 SiO ₂		680
	0.5 PbO		1 B ₂ O ₃		
018	0.5 Na ₂ O	0.4 Al ₂ O ₃	2.8 SiO ₂		710
	0.5 PbO		1 B ₂ O ₃		
017	0.5 Na ₂ O	0.5 Al ₂ O ₃	3 SiO ₂		740
	0.5 PbO		1 B ₂ O ₃		
016	0.5 Na ₂ O	0.55 Al ₂ O ₃	3.1 SiO ₂		770
	0.5 PbO		1 B ₂ O ₃		
015	0.5 Na ₂ O	0.6 Al ₂ O ₃	3.2 SiO ₂		800
	0.5 PbO		1 B ₂ O ₃		
014	0.5 Na ₂ O	0.65 Al ₂ O ₃	3.3 SiO ₂		830
	0.5 PbO		1 B ₂ O ₃		
013	0.5 Na ₂ O	0.7 Al ₂ O ₃	3.4 SiO ₂		860
	0.5 PbO		1 B ₂ O ₃		
012	0.5 Na ₂ O	0.75 Al ₂ O ₃	3.5 SiO ₂		890
	0.5 PbO		1 B ₂ O ₃		
011	0.5 Na ₂ O	0.8 Al ₂ O ₃	3.6 SiO ₂		920
	0.5 PbO		1 B ₂ O ₃		
010	0.3 K ₂ O	0.2 Fe ₂ O ₃	3.50 SiO ₂		950
	0.7 CaO	0.3 Al ₂ O ₃	0.50 B ₂ O ₃		
09	0.3 K ₂ O	0.2 Fe ₂ O ₃	3.55 SiO ₂		970
	0.7 CaO	0.3 Al ₂ O ₃	0.45 B ₂ O ₃		
08	0.3 K ₂ O	0.2 Fe ₂ O ₃	3.60 SiO ₂		990
	0.7 CaO	0.3 Al ₂ O ₃	0.40 B ₂ O ₃		
07	0.3 K ₂ O	0.2 Fe ₂ O ₃	3.65 SiO ₂		1010
	0.7 CaO	0.3 Al ₂ O ₃	0.35 B ₂ O ₃		
06	0.3 K ₂ O	0.2 Fe ₂ O ₃	3.70 SiO ₂		1030
	0.7 CaO	0.3 Al ₂ O ₃	0.30 B ₂ O ₃		
05	0.3 K ₂ O	0.2 Fe ₂ O ₃	3.75 SiO ₂		1050
	0.7 CaO	0.3 Al ₂ O ₃	0.25 B ₂ O ₃		
04	0.3 K ₂ O	0.2 Fe ₂ O ₃	3.80 SiO ₂		1070
	0.7 CaO	0.3 Al ₂ O ₃	0.20 B ₂ O ₃		
03	0.3 K ₂ O	0.2 Fe ₂ O ₃	3.85 SiO ₂		1090
	0.7 CaO	0.3 Al ₂ O ₃	0.15 B ₂ O ₃		
02	0.3 K ₂ O	0.2 Fe ₂ O ₃	3.90 SiO ₂		1110
	0.7 CaO	0.3 Al ₂ O ₃	0.10 B ₂ O ₃		
01	0.3 K ₂ O	0.2 Fe ₂ O ₃	3.95 SiO ₂		1130
	0.7 CaO	0.3 Al ₂ O ₃	0.05 B ₂ O ₃		
1	0.3 K ₂ O	0.2 Fe ₂ O ₃	4 SiO ₂		1150
	0.7 CaO	0.3 Al ₂ O ₃			
2	0.3 K ₂ O	0.1 Fe ₂ O ₃	4 SiO ₂		1170
	0.7 CaO	0.4 Al ₂ O ₃			
3	0.3 K ₂ O	0.05 Fe ₂ O ₃	4 SiO ₂		1190
	0.7 CaO	0.45 Al ₂ O ₃			
4	0.3 K ₂ O	0.5 Al ₂ O ₃	4 SiO ₂		1210
	0.7 CaO				
5	0.3 K ₂ O	0.5 Al ₂ O ₃	5 SiO ₂		1230
	0.7 CaO				
6	0.3 K ₂ O	0.6 Al ₂ O ₃	6 SiO ₂		1250
	0.7 CaO				
7	0.3 K ₂ O	0.7 Al ₂ O ₃	7 SiO ₂		1270
	0.7 CaO				
8	0.3 K ₂ O	0.8 Al ₂ O ₃	8 SiO ₂		1290
	0.7 CaO				
9	0.3 K ₂ O	0.9 Al ₂ O ₃	9 SiO ₂		1310
	0.7 CaO				
10	0.3 K ₂ O	1.0 Al ₂ O ₃	10 SiO ₂		1330
	0.7 CaO				
11	0.3 K ₂ O	1.2 Al ₂ O ₃	12 SiO ₂		1350
	0.7 CaO				
12	0.3 K ₂ O	1.4 Al ₂ O ₃	14 SiO ₂		1370
	0.7 CaO				
13	0.3 K ₂ O	1.6 Al ₂ O ₃	16 SiO ₂		1390
	0.7 CaO				
14	0.3 K ₂ O	1.8 Al ₂ O ₃	18 SiO ₂		1410
	0.7 CaO				
15	0.3 K ₂ O	2.1 Al ₂ O ₃	21 SiO ₂		1430
	0.7 CaO				
16	0.3 K ₂ O	2.4 Al ₂ O ₃	24 SiO ₂		1450
	0.7 CaO				
17	0.3 K ₂ O	2.7 Al ₂ O ₃	27 SiO ₂		1470
	0.7 CaO				
18	0.3 K ₂ O	3.1 Al ₂ O ₃	31 SiO ₂		1490
	0.7 CaO				

19	0.3 K ₂ O	3.5 Al ₂ O ₃	35 SiO ₂	1510
	0.7 CaO			
20	0.3 K ₂ O	3.9 Al ₂ O ₃	39 SiO ₂	1530
	0.7 CaO			
21	0.3 K ₂ O	4.4 Al ₂ O ₃	44 SiO ₂	1550
	0.7 CaO			
22	0.3 K ₂ O	4.9 Al ₂ O ₃	49 SiO ₂	1570
	0.7 CaO			
23	0.3 K ₂ O	5.4 Al ₂ O ₃	54 SiO ₂	1590
	0.7 CaO			
24	0.3 K ₂ O	6.0 Al ₂ O ₃	60 SiO ₂	1610
	0.7 CaO			
25	0.3 K ₂ O	6.6 Al ₂ O ₃	66 SiO ₂	1630
	0.7 CaO			
26	0.3 K ₂ O	7.2 Al ₂ O ₃	72 SiO ₂	1650
	0.7 CaO			
27	0.3 K ₂ O	20 Al ₂ O ₃	200 SiO ₂	1670
	0.7 CaO			
28		Al ₂ O ₃	10 SiO ₂	1690
29		Al ₂ O ₃	8 SiO ₂	1710
30		Al ₂ O ₃	6 SiO ₂	1730
31		Al ₂ O ₃	5 SiO ₂	1750
32		Al ₂ O ₃	4 SiO ₂	1770
33		Al ₂ O ₃	3 SiO ₂	1790
34		Al ₂ O ₃	2.5 SiO ₂	1810
35		Al ₂ O ₃	2 SiO ₂	1830
36		Al ₂ O ₃	2 SiO ₂	1850

The melting points of the cones stated according to degrees Celsius can by no means claim scientific exactness. They have only been made in order to give an idea by figures according to the old custom, as may be here again mentioned.

For bringing down cone 26 the highest temperatures are required, such as could, up to the present, only be attained in some kilns. This cone at the same time corresponds to the melting point of those clays which, in the clay industry, are considered the lowest refractory materials. For ascertaining the refractory power of clays in the Deville blast furnace the mixtures from 27 to 36, whose melting point reaches the melting heat of platinum, and which contain no fluxes, have been arranged.

Observations of burning by means of Seger cones, whose melting points divide the heating period from red heat up to the melting point of platinum into fifty-eight intervals, has considerable advantages over other methods of observing the progress of heat in burning clay goods, viz.:

1. The ceramic products are, during burning, subjected to a number of pyrochemical processes, which, although accelerated by an excess of heat, can also be brought to a finish with somewhat lower temperatures by the longer influence of the same. If, therefore, the clay products were to be baked according to degrees of a thermometer, without considering the time, especially of the full fire, there would be danger of producing goods which are either burned too much or not enough. For this reason it is better to quite drop the observation of the temperature according to the degrees of a scale resembling that of a mercury thermometer in burning clay ware.

2. Equally infeasible is the burning by metals or alloys, not speaking of the fact that the latter sometimes dissociate while melting (especially the alloys of platinum and gold, with a high proportion of platinum). The fusing of the same is based upon a purely physical process, and is only dependent on the height of temperature, but not of the time it lasts. It therefore takes place under conditions which considerably differ from those which are determinative for the complete burning of the clay articles.

3. Any workman can be employed for watching the melting of the cones, but the preparation and the control of the pyrometers, no matter of what kind they may be, requires the time and attention of a scientifically trained employe, who is seldom met at small manufactories, to the disadvantage of the latter.

As silicates of alumina, the cones are, in their composition, similar to the products of the clay industry, and when slagging and melting the pyrochemical processes are the same as those of the products to be burned; one is always sure that the goods are hard when the cone corresponding to the finish-

ing temperature of the product is melted in the least hot part of the kiln.

In order to ascertain what cones are required for a good burn, the first few times a larger number of various cones must be put into the kiln. The first time bricks must be placed around the cones so that no flame can touch them. The burning is then continued under the usual precautions, and when taking them out the cones are examined. If they look, for instance, as shown in the cut, one may conclude from this that the temperature in the kiln corresponded to the melting point of cone No. 7. But if, on examining the burned product, it should be found, for instance, that the burning was higher than is usually desired, a further trial would have to be made with quicker melting cones (in this case with Nos. 4, 5, 6 and 7).

Likewise, if the cones which have been put in are not melted, lower fusing cones than those from 6 to 9 must be used (for instance, 1 to 5). If, in this manner, the proper finishing temperature has been ascertained, henceforth three cones are usually sufficient, which are so chosen that the first one, like a watchman, indicates by its melting down the first stage of the finishing heat. The melting of the second cone must then be observed with the greatest attention, and the third one should be inclined a little and have rounded edges, thus serving as a check for keeping within the required temperature. The cones are put up so that they can be observed through a peephole. The firing of the kiln is accomplished in the usual way, but care must be taken that only the two cones are melted and the third one remains sharp-edged.

The cones must always be watched from at least two places in the kiln, i. e., near the place where the fire enters, in the hottest part of the kiln, and near the outlet, where the ware receives the least fire. The heat ascertained by the cones thus, on the one hand, shows its maximum, which must not be exceeded, without detriment to the product, and, on the other hand, it shows the minimum, which must be absolutely reached. According to the construction of the kilns and the flame conduits in the same, these places will, in vertical kilns, be situated above or below, and, in kilns with horizontal flame direction, in the front or behind. Attention must be paid that at every burning the cones receive the same place and that they are protected against the flame. In order to make them visible a channel is made for them, and it very much facilitates the observation if the channel is conducted some distance past the place where the cones stand. In kilns in which seggars are used they are placed in a seggar, open at the front and behind. The cones usually incline all to the same side when melting. In order to prevent them from falling over when melting down, they are fixed to a fire clay plate with a little clay. The cones are considered melted when the bending point touches the fire clay plate. This point can always be exactly recognized. The most suitable way is to watch the cones through horizontal tubes built into the wall of the door or through channels left open in the walls of the kiln. In the front the tubes are closed by a plate of mica. For setting the cones Heintz's hanging boxes of fire clay can be used, which have the two shapes shown by cuts.

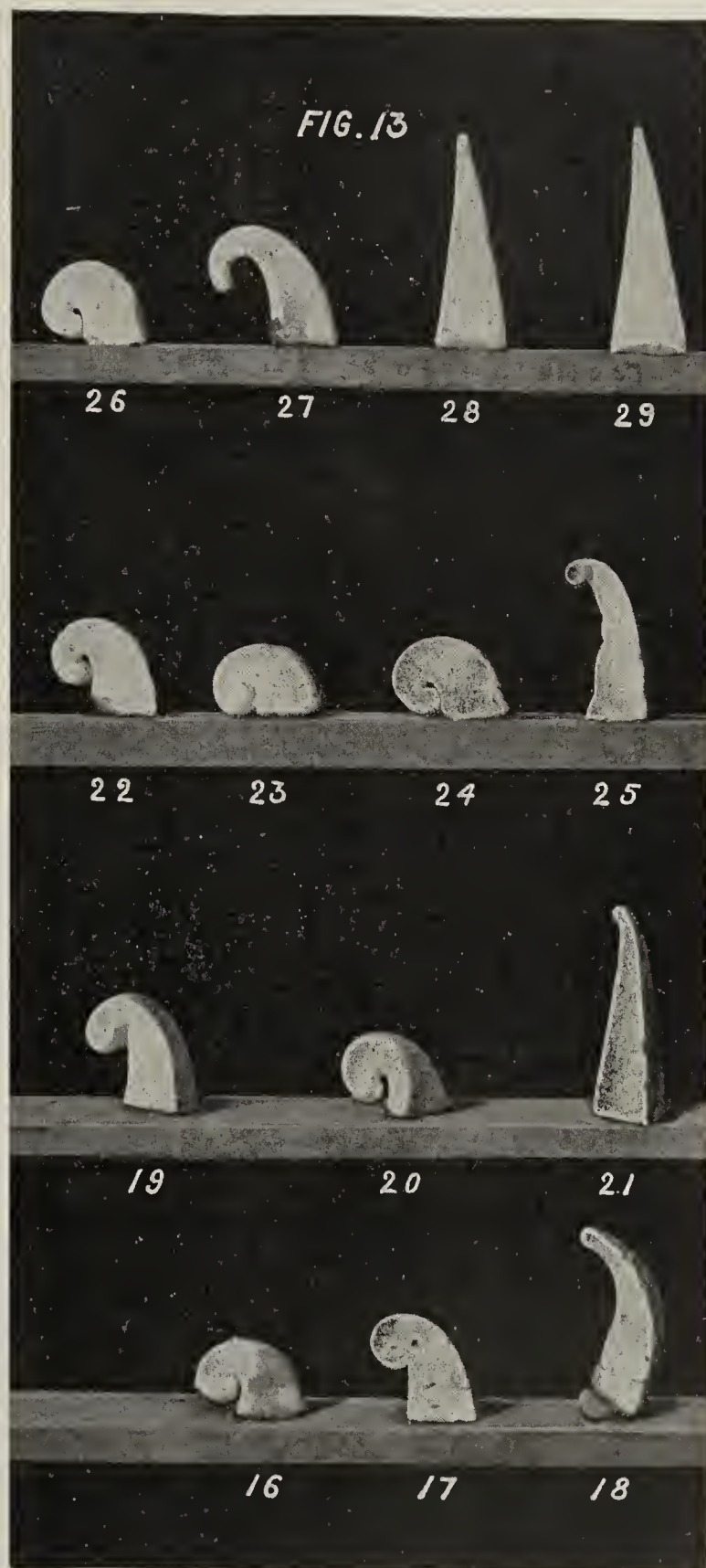
These are placed into the kiln with the cones at the start, and may be taken out during burning. Under some circumstances they may also be placed in the kiln during the burn. These stands can be had for 20 cents apiece; for higher temperature, at 50 cents each.

In order to measure the temperature in technological furnaces the Seger cones have in many cases been used with good success. Many prominent experts have become accustomed to stating temperatures according to the melting point of Seger cones. If they state, for instance, that in such and such a kiln cone 15 melts, this is—although a different expression from the usual one—still a definite statement, which can be confirmed at any moment.

Seger's cones, from 26 to 36, serve for judging the refractory clays and the accessory materials as regards their fusibility.

The determination of the melting point of refractory clays,

chinas, quartz, kaolins, magnesia, brick, etc., is accomplished by first molding the samples to be tested into small three-sided pyramids of 1 cm. base (.39 inch) and 2 cm. height (.8 inch). If the samples are not free from organic matter they must be heated for some length of time at mild red heat in order that all carbon may burn out. The little test bodies are exposed in a crucible of a most refractory substance to a high temperature, which is controlled by Seger's cones. The heating of the



samples is effected in a Deville furnace without cover, which, as is known, consists of a hollow cylinder of refractory material, which is, at the bottom, connected with a strong wrought-iron plate. This plate has in the center an aperture of 3 cm. in diameter, round which two rows of fine holes of 6 mm. bore are grouped in equal distances. The refractory cylinder of 35 cm. height is surrounded by an iron mantle, which projects 8 cm. under the perforated plate, and rests on an iron disk with three legs. The space between the disk and the base

plate has at the side a round opening of 25 mm. in width, through which air is introduced under pressure by means of cylindrical bellows of 50 cm. in diameter. The projecting, turned-up edge of the iron disk is luted with a sandy, non-shrinking clay, so that the air blown in cannot escape. The burning space is slightly conical, and has at the bottom a diameter of 9 cm., at the top of 11 cm.

The refractory lining of the kiln, which is about 6 cm. thick, consists, up to the height of about 12 cm., of slagged magnesite. The other part of the lining is stamped out with a mixture of 90 parts of slagged magnesite and 10 parts of best china clay. Such lining is exceedingly resisting and durable. For making the test crucibles, strongly burned grog of equal parts of alumina and best china clay is used, which is worked with an addition of best kaolin, required for molding. For the supports of the crucibles we use, for the sake of cheapness, refractory chamotte material, which does not melt below the Seger cones. Our crucibles are so difficult to fuse that Seger cone No. 36 (best clay slate) can be completely melted down without the crucibles showing signs of melting.

In order to carry out the melting trials, the kiln is first connected with the bellows, then the turned-up border of the three-legged disk is smeared out with very sandy clay, and the crucible charged with the trial bodies. The crucibles have a height of 50 mm., an exterior diameter of 45 mm. and 5 mm. thickness of wall. The lid of the crucible is 5 mm. thick, and the support has a diameter of 45 mm. and is 50 mm. high.

In the crucible a layer of 7 mm. of a finely sieved mixture of the best, most carefully washed china clay and alumina is put and firmly pressed down. Now the test pieces and the Seger cones are placed on the layer in alternate order, forming a circle. By means of long-armed iron tongs the crucible support is placed on the large hole of the bottom plate, the covered crucible is put on the support and the firing is commenced. The firing is started by lighting about 30 grams of crumpled paper and throwing it into the fire space, when the bellows are worked very slowly, say twenty-five treads per minute. On top of the paper some 200 grams of charcoal are placed, in pieces of the size of hazelnuts. While treading the bellows the white ashes of the paper are thrown out of the kiln. When the charcoal has caught fire a weighed quantity of crushed retort graphite is strewn into the fire room. Retort graphite, on account of its small proportion of ashes and its great density, is the most suitable fuel. It is crushed down to the size of hazelnuts, about three hundred pieces weighing one kilogram. The treading of the bellows is increased to about fifty treads per minute, and continued until the crucible becomes distinctly visible. As a rule, we commence with 900 grams of retort graphite, which, in most cases, melts cone 26. In order to obtain higher temperatures, we increase the quantities of fuel, from trial to trial, by 26 grams each time.

If it is desired to again use the furnace right after the trial, the crucible and the support are taken out by means of the long-handled tongs and the remains of the red-hot coal are pushed through the larger opening in the perforated bottom into the bottom space. After this a new support and crucible are inserted, 200 grams of small charcoal put on, and then the weighed quantity of fuel is added, when it must be considered that the hot kiln requires from 200 to 300 grams less graphite than is used when starting with a cold furnace. The exact quantity will be determined in a few trials. After cooling, the crucible is carefully broken. In comparing the trials it must be considered that the clays can be compared only with each

to 01; brick and tiles from clays low in lime and iron, also for paving brick, floor tiles, etc., cone 1 to 10; stoneware, with salt or slip glaze, cone 5 to 10; white ware (biscuit burn), cone 3 to 10; white ware (gloss burn), cone 010 to 01; fire clay ware, cement and porcelain, cone 10 to 20; silica brick, high fusing glasses, steel and water-gas industry, cone 20 to 25; determina-



tion of refractory power of clays and other materials, cone 26 to 36.

The cones are supplied singly or, as may be required, in cases containing from 100 pieces upwards, at the price of M. 4.50 per 100 at Berlin. For smaller quantities the price is 5 pfgs. each.

March, 1896. 6 Krupp Str., Berlin, N. W. 5.

Chemisches Laboratorium fuer Thonindustrie, Prof. Dr. H. Seger and C. Cramer.

GERMAN NOTES.

THE DIFFERENT MEANS which help the burner in the firing of the better grades of clay ware are discussed in the Thonindustrie-Zeitung by Mr. Koehler, who describes several high-priced pyrometers, which, though quite accurate in determining the temperature, are, as a rule, too complicated and require the attention of a skilled observer. He then proceeds to mention various types of pyroscopes, balls of ochre, which, when taken from the hot kiln and cooled, suddenly show different shades, according to the degree of heat to which they have been subjected, slip trials, different shrinkage trials, feldspar cones and the Seger cones. The latter, he thinks, are the most practical and efficient help to the burner.

The same journal gives a very interesting account of the Marienburg, a great historic castle of Eastern Prussia, which at present is being renovated and partly rebuilt in harmony with the still existing portions of the antique pile. The castle was originally built of brick exclusively, and truly artistic results have been obtained by the use of this material, although the means employed were comparatively simple—plain shape brick, terra cotta and glazed ware. The latter was used extensively for interior decoration with charming effect. A specimen of a green glazed brick was analyzed and the glaze reproduced, being composed of 57 parts of lead oxide, 7 parts of kaolin, 4 parts of copper oxide, 3 parts of oxide of tin and 29 parts of sand. Altogether, the castle is an example of a brick architecture which, in boldness and truthness of design, exceeds the somewhat stale modern German style.

A Berlin paper, the Tageblatt, claims that the period of brick fronts is declining. The objection raised against them is that they have produced a monotonous style which lacks spirit. It is urged by the enemies of the brick front that the exteriors of various brick buildings, schools, churches, town halls, are so very much alike that they have become an eyesore to the public taste. It will be endeavored to revive the plaster and stucco fronts, and the city architect has taken steps to that effect. The German Clayworkers' Association will probably fight the innovation and defend the brick style. This state of affairs is not very complimentary to the German brick architects. It might be a good thing for them to study American brick architecture, which is anything but monotonous.

The Williams Patent Crusher and Pulverizer Company, St. Louis, Mo., write us that they recently shipped two pulverizers to Christiana, Norway, to a brickmaker who saw their ad. in the Clay-Worker. This is not the first time that Messrs. Williams & Co. have realized that the Clay-Worker encompasses the globe.



other, while the cones merely indicate to what temperature the tests have been heated.

The different branches of the clay industry use the cones in the following order for determining the finishing temperatures of their wares:

For porcelain colors and luster decorations, cone 022 to 010; brick and tiles from calcareous and ferruginous clays, cone 015

THE SIMPSON BRICK PRESS COMPANY'S NEW PLANT.

A VISIT TO the new factory and machine shops of the Simpson Brick Press Company, Chicago, will demonstrate clearly the truth of, and add force to, the statement they make on page 89 that they are "in the business to stay." They are certainly well fixed to carry on the business of building brick presses.

It has long been Mr. Simpson's ambition to have a shop of his own in which the work of constructing his presses could be performed under his immediate direction, in order that every detail might be scrutinized as the work progressed, thus insuring better results, both for his company and his patrons. We congratulate him on the realization of his wish.

The new shops are located at Seventy-seventh street and Jackson avenue, and are readily reached from the business center of the city either by trolley or steam cars. The quickest way to make the trip is to take an Illinois Central express train to Grand Crossing, from which point it is but a short walk to the factory, which is a large two-story structure, built especially for manufacturing purposes. It is well equipped with machinery designed for this particular character of work. The plant embraces a blacksmith shop, having a full complement of smith's tools, a woodworking department, fitted with every desirable convenience, and a machine shop, fully equipped with modern appliances for making and handling heavy machinery. In brief, they are now thoroughly equipped for the manufacture of their presses and a full line of brickyard supplies, including their clay screens, elevators, steamers, etc. One feature of importance is their testing department, where they have facilities for working specimen clays that may be submitted to them for the purpose of determining their adaptability to the dry press process. Here the clay can be pulverized, screened and pressed into brick in the same manner as on a brickyard. Where desired, the brick will be burned, thus showing just

what the clay will make. After looking through their factory we are convinced that the Simpson Brick Press Company is "in the business to stay."

SOUTHERN CALIFORNIA.

A company composed of Los Angeles and Pasadena men has been formed to manufacture at Elsinore, Durant's building blocks. This company has decided to lease for a term of years the works of the Elsinore Clay and Coal Company, erected by a San Francisco company for the manufacture of sewer pipe, but now standing idle.

Elsinore is the only point in Southern California where coal mining is done, and has a wonderful variety of plastic fire clays. These clay deposits do not seem to be connected with the coal veins, but are quite independent of them, and range from fine potter's clay to excellent fire brick clay, and occur in large bodies. The coal mined is, more properly speaking, an excellent lignite, the vein ranging from four to fourteen feet in thickness.

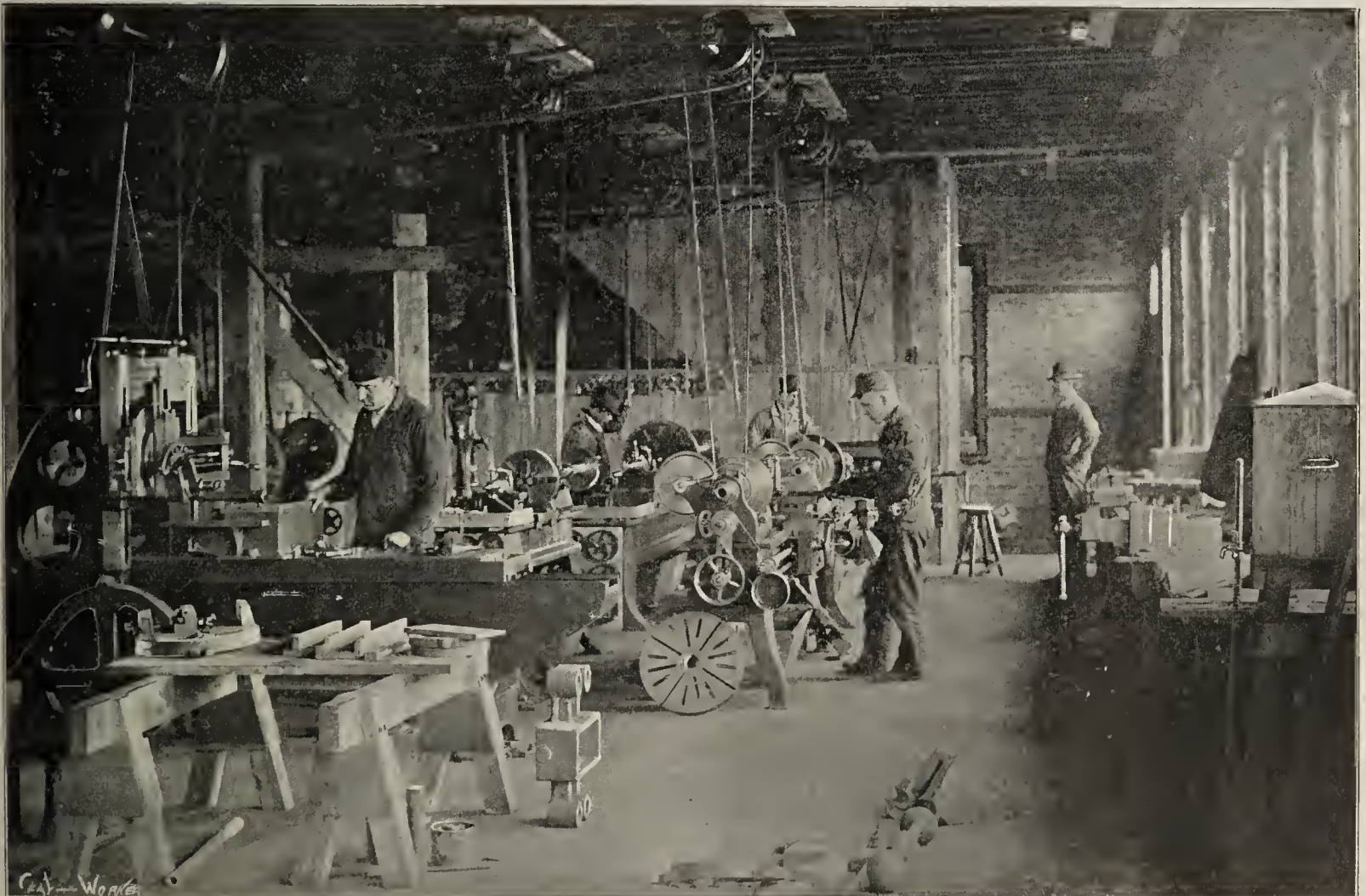
Elsinore is famed in Southern California for its beautiful lake, fed by a stream from the San Jacinto mountains, and for its medicinal springs, both hot and cold. It is on the line of the Southern California Railway (Santa Fe system), in Riverside county, about seventy-five miles from Los Angeles.

While this company is organized primarily for the manufacture of ornamental building blocks, it will no doubt also manufacture sewer and water pipe and fire brick, having been originally outfitted for this purpose. It will be in the hands of practical clay men, who own a large share of the stock, and whose business headquarters will be at Los Angeles.

OCCASIONAL.

ANCIENT POTTERY UNEARTHED BY A WORKMAN.

C. W. Swaney, while excavating in the western part of East Liverpool, O., unearthed a very peculiar piece of old pottery. The vessel is unlike anything ever made in the East Liverpool potteries, and speculation is now rife as to whether the aborigines or the early English settlers in this section operated the first pottery in this center of what is now a most important American industry.



Interior of Simpson Brick Press Co's Machine Shop.

HOW SOME BRICKMAKERS CUT PRICES.



THE QUESTION of cutting prices to secure orders has been discussed pretty thoroughly within the past three years, and is really the most important to brick manufacturers that can be considered while hard times reduce demand, and this cannot be prevented. Yet where brickmakers have acted in harmony fair prices have been realized through these dull years. If this can be done in one market it is possible to accomplish the same results in other markets. Consumers usually accept existing prices with little remonstrance, and just as many bricks can be sold at \$5 per thousand as can be sold at \$4 per thousand, so that ruinous prices are not brought about by consumers, but by the short-sighted policy of brick manufacturers, who cut prices to secure a temporary advantage over their competitors. While this is true, yet there are other ways by which a like result obtains.

Instead of cutting prices, some brickmakers say, We will not sell brick below market price, but we will get ahead of our competitors by making our brick larger than the customary size in our market. This will give us the preference at the same price. This is simply getting to the same point by a different route—a sort of underground route. This compels his competi-

A little organization that brings competitors together in a social way will do wonders toward promoting mutual interests, and will prevent interested parties from playing one against the other until they get brick at their own prices. This has been done in hundreds of localities throughout this country during these years of financial depression. Let us reason together, and, as much as possible, act in concert where our business interests are involved.

R. BRICK MORRISON.

A PRECESS FOR PRODUCING BLENDED GROUND COLORS ON POTTERY ALLEGED TO BE INFRINGED.

A suit was filed in the United States Court at Columbus, July 14, by Miss Laura A. Frye, a talented ceramic artist, of Cincinnati, against Mr. S. A. Weller and the J. B. Owen Pottery Company, of Zanesville, O. She charges them with infringement on certain patents held by her, and asks for injunction and damages.

Miss Frye invented a process by which pottery can be given ground colors wherein several shades blend together on one piece. Licenses for the use of the process were sold by her to the Rookwood Pottery at Cincinnati and to Mr. W. A. Long, the inventor of Lonsdale, who brought the art to Zanesville. The process was used by the Lonsdale Faience Company in the production of that exquisite ware, and on that ware the effect



W. H. Fizer, T. L. Myers and Emil Fernholtz, a trio of Hustlers composing the the Fernholtz Brick Press Co., St. Louis.

tor to either reduce the price of his smaller brick or follow suit and enlarge his molds. Of two evils I would prefer a direct cut in prices to an indirect cut by enlarging the brick. Let us consider results if we make our brick one-eighth of an inch thicker. If they are $2\frac{1}{2}$ inches and we make them $2\frac{3}{8}$ we add 5 per cent. to our brick, or a gain of 5,000 bricks in each 100,000; that is, we get pay for 100,000 bricks now where we got pay for 105,000 old size. These larger brick require more clay to each brick. This means less number of brick in each kiln, more labor to handle material and more fuel to burn them. When we come to ship them the extra weight adds to the freight charges. In the end the loss falls on the brickmaker. The gain all goes to the contractor and consumer. This odd size will not work well with other bricks, and causes the architect to figure brick work from a different basis. Should you ship to other points your brick will not work with others made the standard or customary size.

I do not think any thorough, well-informed brickmaker will ever make this awful blunder; none but novices ever undertake to beat their competitors by this route. It is a crooked route, full of pitfalls and illusions, and, like the mirage in the desert, lures the inexperienced brickmaker to financial ruin. The practical, well-trained brickmaker needs no admonition on this line; he sees the end from the beginning. But the tenderfoot brick manufacturer would do well to heed the warnings of his friends and avoid the breakers that lie in this channel.

has become familiar to all Zanesvillians of artistic tastes. Since the dissolution of the Lonsdale Company the license has rested in the hands of Mr. Long and his son, C. C. Long.

Latterly, at the potteries of both Mr. Owen and Mr. Weller, experiments have been conducted with very considerable success for the production of new lines of high art pottery. The blended ground effect appears on the new ware manufactured at both places. Miss Frye, after visiting here a few weeks since, decided that these effects were being produced by means similar to her own processes, and hence she returned to Cincinnati and instructed her attorneys to begin infringement suits.

On the part of manufacturers here it is claimed that, while results are admittedly similar to those attained by Miss Frye's methods, their processes are sufficiently distinct from hers to make them safe from interpretation through the patent laws. There is plenty of wealth on both sides, and valuable interests at stake, and there is no doubt but that the contest will be stubbornly fought.—Zanesville Courier.

DECATUR GETS THE ILLINOIS CONVENTION.

The worthy Secretary of the Illinois Clayworkers' Association, Mr. G. C. Stoll, advises us that the Executive Committee has accepted the invitation to meet next winter in Decatur. The choice is a wise one. No city in the State is more accessible to Illinois clayworkers generally, and a large attendance will surely result. Of this, more anon.



NASHVILLE'S JUVENILE BRICK PLANT.

THERE ARE MANY THINGS in and about Nashville, aside from her great Exposition, to hold the attention of visitors. Brickmakers will, of course, want to visit her brickyards, for the fine brick structures which line the principal business and resident thoroughfares bear unmistakable evidence of masterly skill in the manufacture and use of brick and terra cotta.

On the theory that the last baby is always the most interesting, we will first pay our respects to the latest arrival in Nashville's brick family, which is now in its second year, and leave the old-timers for a subsequent number.

—The Fizer Brick Plant—

Is located several miles from the city, in the vicinity of the State Penitentiary, which accounts for the peculiar fashion of dress adopted by most of the employes. An hour's ride through a beautifully picturesque country brings one to the end of the trolley line and within full view of the penitentiary, which, though occupied, is not yet completed. The main building is a fine structure, as our readers may see by the illustration on page 95. For this and other photos we are indebted to Mr. Geo. H. Kilker, of St. Louis, who has had charge of the presses the past summer, and who is a success both as a photographer and a brickmaker. The great structure is built of buff brick from the kilns of W. H. Fizer & Co., and will stand a monument to their skill for many years.

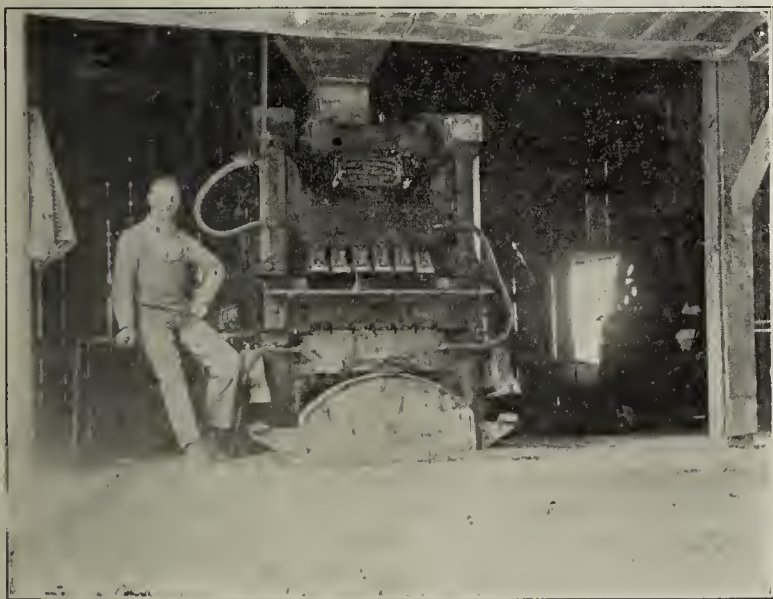
The works lie some three miles beyond the penitentiary in

patched with an equally trusty saddle horse, on which I made the trip in nearly the same time that the young man in the striped pants walked back. Mr. Fizer welcomed me to the plant and complimented my horsemanship. He was evidently as much pleased at my safe arrival as I was myself. The next time I ride horseback I'll walk.

The works were built in the early part of 1896. They have many acres of good clay, which ranges from fifteen to twenty feet in depth, and burns red. The buff brick referred to are made of clay shipped from West Tennessee, where they also have an extensive bed of fire clay, which they are shipping to St. Louis. The original plant consisted of a dry press outfit from the shops of the Fernholtz Brick Press Company, of the latter city, of which Mr. Fizer is Secretary and Treasurer. They have one two-mold and one six-mold Fernholtz press, on which they have heretofore made both their common and fine front brick. Mr. Fizer commends these presses very highly, and thinks for steady-going qualities they cannot be beat. They were installed under the supervision of T. L. Myers, who will, in the near future, add to the plant a battery of his balanced



Tramway from Clay Bank to shed.



A Fernholtz Six-Mold Press and operator, Mr. Kilker.

a fertile valley, which heretofore has been given up to agriculture. Unless fond of long walks, the visitor would do well to let Mr. Fizer know in advance of his coming, so he can meet him at the end of the trolley with his buckboard. In my case, the buckboard being temporarily disabled, a "trusty" was dis-

up and down-draft kilns in which to burn the fine pressed and ornamental brick.

Wishing to increase their output of common brick, they are adding to the plant a stiff clay outfit, consisting of a Potts fifteen-foot pug mill and one of Freese & Co.'s "A Special" side cut machines. The latter was not in place at the time of our visit.

For the dry press plant the clay is plowed or loosened with pick by hand, gathered in wheelbarrows and "toted" to a little platform, beneath which stands a dump car, which, when filled, is hauled by cable to the shed or passed directly to the pulverizer and thence through screens in the ordinary way to the presses. They are now burning in common clamp kilns, water-smoking with wood for about six days and finishing with coal in about five more. The brick are set direct in kilns from machine, and so far they have experienced little or no trouble from checking. From the kilns the brick are loaded on cars, which run along immediately in front of kiln sheds. Convict labor is employed almost exclusively. The men go about their work cheerfully and seem thoroughly contented. As a safeguard, however, men armed with rifles are stationed about the works and keep close watch upon the zebra-attired workers, so if any but the "trusty" should attempt to wander away they are quickly persuaded to return to their daily task.

With their new machinery in operation the plant will have a daily capacity of nearly 100,000 brick, and will prove an im-

portant factor in the brick business of Nashville. Mr. Fizer is a hustler, having another large plant running at Knoxville, besides being interested in several other ventures. Verily, we Yanks have no monopoly on the energy and "push" so necessary to success in the brick business.

BUTTON-HOLE TALKS—GATES ACCUSED OF TALKING TOO MUCH.

I HAVEN'T ATTENDED nearly so many of these Conventions as you, Gates, but I can see what the real situation is. You meet lots of men here with whom you have the warmest kind of friendship, and you reach out that big hand of yours and get hold of them, and you really seem to want them for friends. You have done a good deal of talking. I won't say whether you may not have done too much of that; but any-

They don't know how. They haven't got a great big hand to reach out and wrap around the other fellow's a few times and squeeze and hold on until you get acquainted. They lack confidence, too, and are in some awe of all you fellows who are always bragging about having been charter members. What if you were? They are not to blame, neither is the Association to blame. It doesn't mean that you own the organization, does it? Did it ever occur to you that the Association might have grown in spite of this instead of on account of it?

"Now, these fellows want to get acquainted with all the old members, but they don't do it because they stand a little in awe of you, with your everlasting talk of being charter members, and with having eternally seen your names in the Clay-Worker. You see, they don't really know, like I do, how little you actually know. So they go on awed down and suppressed, as it were, and they listen to the papers and the discussion, and



A Glimpse of Fizer & Co's Works—A Guard and his "Persuader"—Gathering the Clay.

way, some of them seem to think that you mean what you say and have a heart that has some feeling in it. Speaking of hearts, have you noticed how these men are wearing their hearts here? Not wound round and done up in brass or stored away and locked up in a refrigerator, but carried all ready for use right with them, warm and pulsating. Why, there isn't a mean man in the crowd, and if there was he wouldn't feel comfortable, but would be so lonesome that he would soon sneak off and hide.

"Now, here's the thing I really want to talk to you about. There are a lot of newcomers here, quiet fellows, who think a good deal and talk little. Don't you think it possible that these men hold back and talk little or none because you talk so much that they don't get the chance?

"They want to get acquainted, too, but they can't do it.

they get acquainted with one or two other quiet fellows like themselves, and then go home. All the time their hearts are just aching to know every fellow there, to talk to him without reserve, and have just the happiest kind of a hobnob, only they don't know how to do it, and that very fact makes them miss it all the more. Their hearts are not less soft, or warm, or unresponsive because they don't pull them out and show them to you, but they are rather the softer, and the warmer, and the quicker to respond from the very fact that they are not worn on their sleeves. That they are thus constituted may be their misfortune, and they seem to think it is, and I sincerely trust that there will be less of them going away with this unsatisfied longing for friendship every meeting we hold; indeed, I am sure there will be less this time than ever before, owing to the hearty good-fellowship of the Buffalo brothers." GATES.

R-3 DOUBLE MOLD REPRESS.

THE R-3 DOUBLE MOLD REPRESS, just put on the market by the American Clayworking Machinery Company, of Bucyrus, O., is designed to meet the demand for a press to manufacture strictly high grade stiff mud brick. All pressing mechanism is above the die, as well as all other moving parts. The pressure applied to the brick is by the well-known toggle mechanism, and capable of exerting a pressure of 125 tons on each brick. The upper end of the toggle is pivotally connected with four large steel side bars, and the lower end of side bars are connected to a steel cross-bar; between these two points the brick are pressed, none of the strain of pressing the brick coming upon the frame of the machine or on parts of repress that are revolving. In addition to the toggles there are two auxiliary members which work on rollers, carried by the upper cross-head. These members hold the pressure on the brick while the crank travels through an arc of 60 degrees. By this combination the time the pressure is on the brick is greatly increased. The thickness of the brick can be quickly regulated or the pressure increased or decreased by moving the lever up or down. This lever is shown at the upper left-hand side of press. It is held in position by a spring keeper. Should the mold bottoms become lower than the top of die where the brick are to be delivered on the offbearing belt, they can be quickly adjusted to compensate for this wear by means of the slotted eccentric boxes carrying the lift-out bell crank at the extreme top of machine. The die is composed of a heavy frame, with removable white iron liners five-eighths of an inch thick, forming the most durable kind of mold. These liners being ground on a special surface grinding machine, they can be taken out and reground, thereby making it possible to keep the molds of a uniform size. To remove liners from die all that is necessary is to slack up on two longitudinal wedges, and all the liners of the mold can be readily removed. The oiling device is all automatic; the reservoir for the bottom oiling is hermetically sealed, and there can be no waste or overflow when the machine is at rest. This repress is so constructed as to press brick with our combination spring pressure, which will exert a pressure of 5,000 pounds to the square inch, or, where the vent is preferred, the spring head can be locked to a fixed position and the vent can be used in the bottom pressure plates. The surplus clay cannot come in contact with any of the wearing parts of the press. In addition to the above methods, the press is built as a paneling repress, both top and bottom paneling. When the paneling attachment is used the brick are all brought to the same thickness by the self-adjusting panel in the top head. The cut of the machine shows the paneling attachment on both top and bottom head. When the paneling attachment is left off all the spring attachments at bottom are taken off, making the repress very simple and with few working parts. Extreme height, 8 feet 10 inches; base, 3 feet 8 inches by 3 feet 6 inches; length of carriage, 7 feet 6 inches; weight, 8,000 pounds.

A cut of this press appears on page 165.

AN OPPORTUNITY FOR CAPITAL.

A gentleman who owns two thousand acres of clay property in central New Jersey, twenty-eight miles from Philadelphia and but sixty-five miles from New York city, writes that he will make very liberal concessions to parties desiring to establish a clay plant on his property. He says the railroad facilities are excellent. There are a large number of good sized towns in that vicinity. The clay averages about twelve feet in depth, and is of good quality. Any of our readers who may desire to correspond with him on the subject will please address "S. Parker," care Clay-Worker.

WAITING FOR THE WAVE.

Publishers Clay-Worker:

Inclosed please find \$2 to renew my subscription to Clay-Worker. Business in our line has been very bad here for about three years, and is still very light, notwithstanding the promised wave, which has failed to materialize so far West as this. I think it must have spent its force east of the river. I sold out my plant here in May to the Jones Brick Company, who are now operating it. I am Manager for them this season. This is the only brick works here. There used to be two others, but too much confidence and prosperity drove them out of business. There is no building going on here, the only demand being for repairs. Three to five hundred thousand brick will supply the demand here for a year. I don't know what I will do after

this season, but expect to engage in the brick business here or some other place in the spring, the Lord being willing. I would feel lost without the Clay-Worker, and look for its appearance each month more eagerly than for any other publication I take. Wishing you continued prosperity, and hoping for better times here by another year, I am sincerely yours,
Atlantic, Ia. H. J. CAVENAUGH.

PREPARATION OF CLAY FOR THE DRY PRESS PROCESS.

The accompanying sketch will interest the readers of the Clay-Worker who are making brick by the dry press process. The screen which Mr. Carmichael has patented is different from anything now in use. The sketch shows the screen in connection with a clay steamer. The following are some of the claims in its favor:

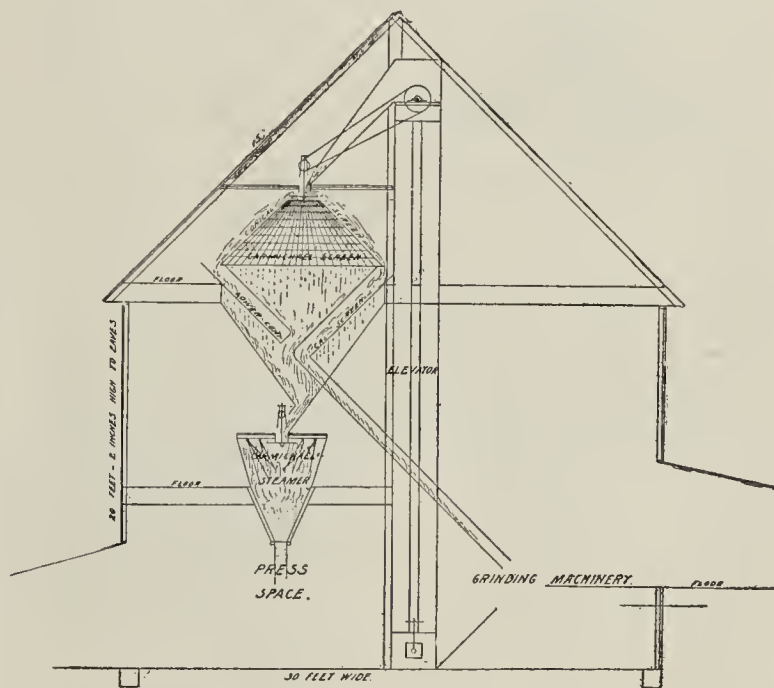
A 12-foot diameter screen of this design has 228 square feet of actual working surface.

An ordinary large inclined screen 20 feet long has about 40 square feet of actual working surface.

A shaking screen has about 36.

A revolving screen has about 36.

The Carmichael screen is accessible at any time from the



A MODEL DRY PRESS OUTFIT.

floor level for cleaning without stopping the machinery, and its screening surface can be easily made so large that it does not require the attention other screens do.

The nice feature of the Carmichael screen is that the screen works all over, and no part of it is punished with overwork while the balance remains idle. See ad. on page 150.

HORSES LIKE BRICK.

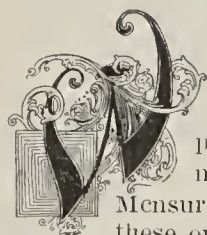
Chief Higgins, of the Albany (N. Y.) Fire Department, is authority for the statement that the horses can pull the heavy engines faster and easier over a brick pavement, even on an up grade, than on other styles of pavement over which they have to travel in that city. The horses seem to get a better foothold on the bricks than on the uneven granite blocks, and, as the traction is less, the horses are able to pull the engines up sharp pitches like that on Swan street with ease and rapidity.

SUGGESTIONS FOR ADVERTISERS.

The standing of a newspaper is like wine. It improves with age. It has seemed to me that the trade-bringing powers of newspapers for legitimate merchandisers depend as much upon the age of the publication and the confidence which the public has in it as it does upon the width of its circulation.—Philip A. Conne.

The small boy who plants garden seeds will frequently dig them up the next day because he finds no ripened beans or corn in the ear. But this performance is no more childish than that of the man who stops advertising because the results are not instantaneous.

Written for the CLAY-WORKER.
RELIABLE INFORMATION.



WHAT PLEASURABLE associations are connected with the retrospection of the sources from which we derived our fund of information. I often regret I did not preserve my Guy's Illustrated Spelling Book, my Walkinghame's Arithmetic, my Hutton's Mensuration, my Lindley Murray's Grammar, etc.; these once much detested schoolbooks would be prized now, as they entered largely into the foundation of the structure I am still rearing. I had no love for my schoolbooks, but I never questioned their accuracy or fitness to go into my building. Later on I began to object to some of the material offered, and as the fabric rises I become more and more restrictive, not in the variety of material, but in the quality. Like most builders, I find it necessary to tear down occasionally and put in what appears to me better material. I regret to find much that is offered is "shoddy," and that even the old theology I used to regard with such fear and respect is no longer a suitable material for the mental temple. In my early days I placed implicit faith in what I found in my books—novels excepted—and I remember what a shock my faith received when it was first shown me that 3.1416 was not the real circumference of a circle with 1 for the diameter, but only an approximation, and the same, of course, with .7854 as the area of such a circle; my youthful mind rested secure that these ratios were exact ones. Moreover, I was informed that the true ratio had not been found, and never would be, so said my teacher. I afterwards read of a mathematician, one Vau Culen, I think, carrying an investigation so far into this matter that he got a ratio with seventy-two places of decimals, which was still only an approximation; this, however, was at that period considered a marvelous feat, and the line of figures were subsequently engraved on his tombstone. Another mathematician, many years after, carried his computations as far as two hundred places in decimals, and still only obtained an approximation to the true ratio. I nursed a good deal of needless regret over this unsolvable problem, and before my sorrow had subsided another idol was shattered. I had a firm faith, founded on ignorance and a lively imagination, of course, that the problem of perpetual motion would some day be solved, and spent much valuable time trying by guesswork to solve it. I subsequently found my cherished hopes fading away, being dissolved by the laws of motion and mechanics. Here, again, my ideas were expanded and improved by absorbing some one else's views on the subject.

Self-reliance is a commendable quality, but the absolutely self-reliant—if such a character exists—wastes more than half his lifetime on problems that were solved before he was born. The careful reading of ten or twelve pages of a book, nay, even ten or twelve lines in some cases, will save or prevent months or years of useless toil and study. To assume we are pioneers in any branch of study or thought generally turns out to be a huge blunder, as is proven by the Patent Office at Washington every day. Work out an original design or invention, and, before applying for a patent on it, look up the patent records, and the chances are that you will find hundreds have been engaged on the same idea years before you thought of it; moreover, you may probably find improvements on your own ideas. It is well, therefore, before presenting to the world your original designs, inventions or ideas, to look up and find the status of ideas bearing on the subject. This, of course, means read, read, read; yes, and it means more, for you must think much, as well. This brings me to the gist of my subject, "Reliable Information."

It is to be regretted that we cannot rely on the accuracy of all we read; neither can we look up to our teachers as disseminators of unadulterated truth—that is, truth so far as it is known. If we would avoid artificial or veneered knowledge we must "read, mark, learn and inwardly digest" all we hear, or read, or think. We must not accept Father Crary's theories of brick setting, burning, building, etc., simply because he is the oldest of the contributors to this journal, but his ripe practical experience entitles him to a patient consideration of every word he writes or says; a careful trial of his practical views is the only course to pursue to demonstrate the worth of his theories. If we wish to investigate the safety, durability and economy of steel structures, so called, we must not base our conclusions on the strictures laid on the subject by Brother Morrison; we must also clear our minds of all bias towards the brick or any other industry, and view the subject from a well-constructed-building point of view, not from any unpro-

portioned "rattle trap"—never forgetting the mason says "stone," the carpenter, "wood," and the shoemaker says "there is nothing like leather." Reading carefully Brother Morrison's April and May articles indicates very plainly that his point of view was nearly wholly from the brickyard, and he will, no doubt, be indorsed by 99 per cent. of the brick manufacturers who read his articles through sympathy of interests. It may be a very difficult matter to bury self-interest when matters of research present themselves, but it must be done when in quest of reliable information.

—Measuring Temperatures.—

I have read with much interest the information Professor Orton has given us about measuring temperature with Seger cones. I am much pleased with the idea; its simplicity commends it at once. It would appear that by the proper use of these cones brick burning is reduced to the simplicity of good firing, or thereabouts; watch the cones soften, lean over and melt, then stop firing and close up.

I am reminded of some experiments I made in Bessemer steel blowing by the spectroscope. Of course, you have all read how exactly the blow must be timed to insure good results. By "timed" I do not mean a specified length of time, for some blows lasted only fifteen or sixteen minutes, while the next one might require twenty-five minutes, but I mean there is a critical point in the blow, very marked to the practiced eye, when the blast must be shut off. This point is also indicated in the spectroscope by the fading out of several lines. This instrument was therefore looked upon as a necessary adjunct to the Bessemer plant. The "blowers" (those who had charge of the blowing) were supplied with a spectroscope, which they used with indifferent success, and were soon after blowing by the naked eye, with the original success. To guard against trickery and prejudice, I was provided with an instrument to check any blow that was made, and I checked hundreds, but I must confess the instrument spoiled more steel than the eye. I followed up my experiments for a little over four years, with the conclusion that if the instrument really is reliable I have something yet to learn about it, and up to the present I am not aware of the constant use of it for Bessemer blowing. Now, as to Seger cones for measuring temperatures, I think they compare favorably with almost any existing pyrometer, but for indicating when a kiln of bricks is burnt sufficiently I doubt its efficiency as compared with the practiced eye of the burner. In heating iron the heater knows that his iron attains its full heat on the outside long before the inside is hot enough; he therefore "soaks" it—that is, heats it until both inside and out are at a nice welding heat. The quality of the iron also affects its welding temperature. This he readily detects by its appearance, and gives it more or less heat accordingly. Now, if the pile of iron has its analogue in the brick, or the brick in the treatment of Bessemer steel, instruments are yet not suited for the practical treatment of either. Do I decry instruments of precision? Not in the least; on the contrary, nothing excites my wonder and admiration more than accuracy in motion, measurement, form, sound, etc.—in fact, anything absolutely reliable. Nevertheless I would strenuously object to a demand for mathematical accuracy in the measuring and weighing of ordinary commodities, as it would entail a waste of time and expense far from commensurate by the small gain to either buyer or seller. The Seger cones have their uses, which, I think, will develop and embrace other industries besides the clay, and may materially assist in training the eye of the clay student, but when that eye is properly trained he will have no use for the cones in burning a kiln of ware.

Information must not go unquestioned because it emanates from what is considered a good, reliable source. Bias enters very largely into all speculative questions, such, for example, as theology, politics, and, I regret to add, history. I am often amused when I reflect on the hell and damnation theology of my boyhood days; of the importance that was centered in a belief; and not less amused with some evangelists of the present day, whose preposterous theology goes back far beyond my time, and whose utterances from the pulpit are nothing short of rank blasphemy; yet we are asked to look on these individuals as the commissioned ambassadors of the Almighty.

I wonder if it were a theologian who wrote that unjust estimate of Stephen Girard referred to by Mr. Beck in his oration on the unveiling of the Girard statue in our city the other day, which appears in no less a work than Chamber's Encyclopedia, simply representing him as "a crabbed skeptic and miser." This, to my mind, not only reveals bias, but malice. It is well known he rejected the creed and dogmas of Christianity, but, as Mr. Beck said, "if he was not a Christian in creed, he was pre-eminently a Christian in deed." * * * Let only those cast a stone at Girard's religion who have done greater good in their lives." Mr. Beck is of the opinion that "what Girard's religious convictions were nobody will ever know," and that "whatever else he was, he was no hypocrite."

Now, one naturally looks up to standard works, such as the

one mentioned above, with unwavering confidence until something of the above nature crops out, and then, like our school history of England, we find it is fallible and no longer to be implicitly trusted.

One need not look long nor far for the motive which prompted such a mean and unjust estimate of so good a man. It must be remembered that in his will ministers of every denomination are expressly forbidden entrance, even into the grounds of the college—for which ample reasons are given. Now, such a discrimination and tabooing naturally enough arouses indignation in the breasts of the clergy, and drew from one of them, no doubt in my mind, the above vindictive aspersion. I am glad, however, to note an exception to such asperity. The Evening Bulletin mentions an excellent sermon by the Rev. Dr. Neely, "a Methodist of the most intense convictions," but he is willing to admit that "if Girard was not a Christian, he had at least fulfilled the declaration of the Master in the essentials of humanity."

—"As Through a Glass Darkly."

There seems to be much anxiety as to the promised prosperity the country would regain by electing William McKinley as President. Some people profess to see some improvement which others fail to see. One thing we all remember; that for weeks and months previous to the election we had it dinned in our ears that "it only needed the assurance of McKinley's election to start the wheels of prosperity humming again." Can we blame those who, believing in such promises, now manifest much impatience to see those promises fulfilled? How very soothing it must be for those out of work to be told day after day for seven months that things are looking brighter! How comforting to be told now that as soon as the tariff bill is passed prosperity will shine on us and good times come to us all! What a cruel mockery to read an editorial in which the same bluff of "prosperous times in view" has been reiterated scores of times since last November, while other portions of the paper report reductions in wages or strikes against such reductions! Why, the reductions in wages since the election have been both numerous and heavy. This ought not to be so, for Mr. McKinley, in his campaign speeches, said that "victory for the Republicans meant business prosperity and a corresponding rise in wages." Just so. An overwhelming portion of the people have not yet been able to realize on these empty promises, nor do they see much prospect in sight, and it would now seem in order for those who so clearly see prosperity looming up in the near horizon to explain the simultaneous cuts in wages, the cutting down of the number of employes and this dawning of better times. The brick industry, I believe, is at present the only one—including, of course, the building trade—enjoying any degree of prosperity worth mentioning in Philadelphia. Take the staple trade of the State, the iron trade, and next the coal trade, and what do we learn? We are informed by the daily press that coal lands are being found and leased, new shafts are being sunk, etc., and on the same page we find, "Coal trade dull; stocks heavy and accumulating; some cutting of circular prices," etc. All this, mind you, under a restricted output. In the iron and steel trade notices we find:

Philadelphia Inquirer, June 5: "The iron trade is reported to be a little better, but the report is based on the expectation that it will be better, rather than upon a real improvement in conditions. * * * At the present time the admitted facts that prices are down to cost; that neither the ore producer, the ore carrier, the furnace man or the steelmaker is making any profit, and that values cannot sink lower, have no influence in inducing buying."

The Inquirer is a pronounced optimist in matters pertaining to the McKinley administration and business, but is somewhat vacillating as to "business conditions and prospects." Its readers are treated with an editorial on this subject every Monday morning, commencing very much in the strain of Brother Randall's first sentence on "The Business Outlook" in the Clay-Worker for May, and apologizing very much in the same way for the exuberance of his hopes. Here is a specimen from Monday's issue, June 7: "The signs of improvement in the business situation that always precede an important change for the better continue to multiply. Everywhere great preparations are being made to meet the new conditions," etc. The music now changes into the minor mode or key, and we are entertained by the following strains: "Naturally enough, there is some irregularity, for the current consumption does not always come up to expectations, and a curtailment in the output is not infrequently necessary." All this in a paragraph of eighteen lines. What is the full import of curtailing the output? Does it not mean curtailment of workmen's time and wages? To whom does curtailment of output bring prosperity?

Brother Randall also strikes the curtailing note and endeavors to make it one of the elements of prosperity by showing that adversity has taught us to curtail our wants. Will this not also curtail the business of those who supplied these wants? He also informs us that "times are better because the

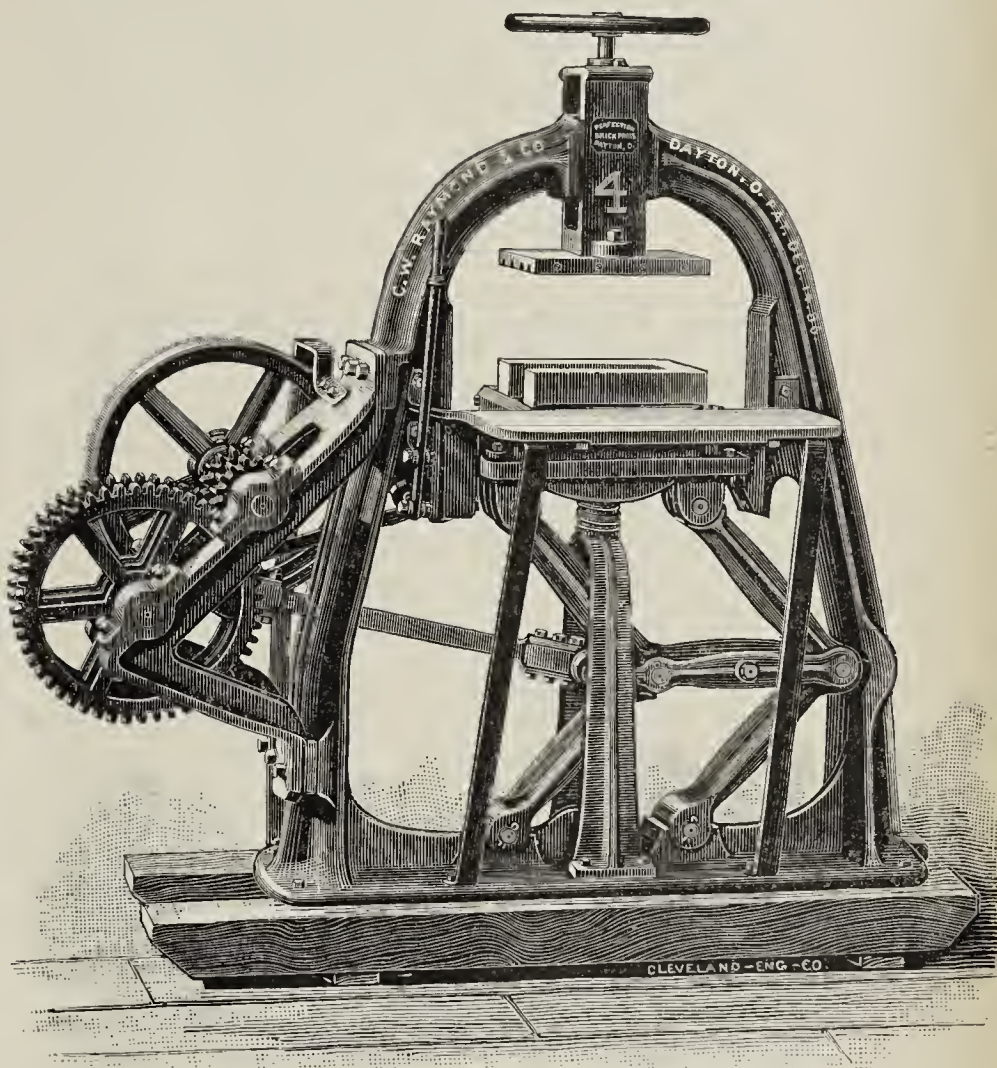
people are adjusting themselves to conditions," etc. Now, this passes my comprehension altogether. I am aware that thousands upon thousands are compelled to adjust themselves to very undesirable conditions, but it never occurred to me that this was an indication of better times. In my next I will take up other points of reliable information, or, perhaps, I might call it "unreliable" without doing it an injustice.

WM. WAPLINGTON.

THE RAYMOND NO. 4 PAVING BLOCK PRESS.

WE PRESENT herewith an illustration of the Raymond No. 4 power press for pressing large ornamental brick and paving blocks. This machine is constructed on the line of their well-known Perfection and Columbian presses, but has no feed and delivery. The pressure is derived from the powerful toggle movement, and the top platten is instantly adjustable to any thickness of brick desired.

The block to be pressed is placed on the die, the machine thrown in operation by means of a lever and the pressure ap-



The Raymond No. 4 Paving Block Press.

plied. If the design is not fully developed another pressure may be applied, and, when completed, the machine is stopped and the block carefully removed by hand.

This press is especially valuable for pressing larger sizes of fire brick and all classes of block work where special finish is necessary, as the same care can be taken on it as on a hand press, the only difference being that the pressure is applied by power. It will do the work much more rapidly than it can be done by the former, and dispenses with the necessary man or men at the pressing lever.

We think it would be to the interest of those engaged in this line of work to correspond with Messrs. C. W. Raymond & Co., of Dayton, O., as to the particulars of this machine, as we think it would prove a source of considerable profit and saving to them.

Of all sad words of tongue or pen,
The saddest are, "It might have been."
But none can cause one so much woe
As these short words, "I told you so."

—Detroit Free Press.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

"Hack—Stack."

Editor Clay-Worker:

In the last issue of your journal I notice a desire expressed for the origination of the word "hack," or "stack." The word, in our opinion, was originally "stack," but its use in England, where the "H" is an unknown letter, and is generously ignored in many words whether it appears there or not, gave the word "stack" the sound of "ack," and it was brought to this country and the "H" put on, and is used by many in that way. However, this is only the opinion of the writer.

Bucyrus, O.

A READER.

Clayworking Literature.

Publishers Clay-Worker:

I have been rereading with care such numbers of the Clay-Worker as I have been able to lay hands upon, beginning with the issues of 1889, and have been impressed with two things:

First—With the growth of the Clay-Worker, as indicated by the increased number of pages of reading matter embodied in each issue, which, in 1889, averaged about 18½ pages, while the present year has so far seen an average of double the number.

Second—I have been more impressed with the permanent value of many of the contributions to the pages of your journal in the past ten years, and while to single out would seem to be uncalled for where there is so much that is good, I cannot forbear making mention of the high character of the series of scientific articles contributed by D. W. Stookey, Wm. Waplington and "HydroCarbon," and the single and serial articles contributed by Professor Orton.

I have found myself wishing that these might find a place on our shelves in book form to insure permanence and convenience for reference, and for the benefit of the rising generation of clayworkers. Dealing, as they do, with what is unchanging and fundamental, the truths presented are as vital and permanent in value to the clayworker as is the multiplication table to the beginner in arithmetic.

The records of papers presented and discussions that have taken place at State and National Conventions of clayworkers are also invaluable to the practical man, to say nothing of the practical value of the articles contributed by Crary, Morrison and a host of others, and the clayworker, young or old, who does not take time to carefully read and reread and digest much contained in these records will not be likely to reach a large measure of success in this age, which is sifting out the best. It is true alike in the realm of our social and business relations. As Lowell aptly puts it:

"Time makes ancient good uncouth;
He must upward still, and onward,
Who would keep abreast of truth."

And I may add, by way of application, "or abreast of his brother clayworker who does read, listen, reflect and then act."

I am glad clayworkers have numbered in the past men of sturdy character, who have dignified the calling, like Crary, and can number in the present a host of others whose names and faces are familiar at Conventions, and who unselfishly impart to their fellows the results of their researches, and often of their costly experiments.

Several of your contributors, prominent among whom are those already mentioned, have laid bare the foundations upon which all successful manipulation of clays must be builded, whether recognized or not.

A scientist and philosopher may find plenty of food for research and reflection between the mouth of a kiln furnace and its smokestack, and the man with a bank account who has embarked in the manufacture of clay wares, if he fail to recog-

nize and act upon the truths they promulgate, will be likely in these days of keen competition to be left in the rear.

May it not be said that the measure of success which attends the processes of manufacture in any line must depend altogether upon the obedience of the operator to the laws of nature which inhere to the material handled?

When the manager of clay works comes to understand that it is as vital that two and two-thirds pounds of oxygen keep company with one pound of carbon during the process of combustion as that the office man shall be depended upon for correctness in figures, there will be more honest and untiring search for the best way of securing such conditions.

My first experience in manufacturing, dating back thirty-five years, led me then to formulate this proposition, which I have seen verified hundreds of times since, viz.: There is a fair profit in fair times between the results of ordinary and good manufacturing, and another fair profit between good manufacturing and the best. In hard times the "ordinary" drops out of the race, and the "good" frequently, while the "best" is an illustration of the "survival of the fittest." That you may continue in your journalistic labors to stimulate and equip men engaged in an important and attractive industry to higher achievements is the wish of yours truly,

E. G. D.

The Village Brickyard—Coming out From Among the Clinkers.

Editor Clay-Worker:

In the Clay-Worker for July a plan was submitted for setting a Dutch kiln with an open bottom, which was, substantially, to set as usual, except the middle brick of every arch was set "three on three" all the way up to the platten, thus making a flue from the floor to the top of the kiln.

My friend Randall, in a kind note, intimates "if the story is true as there told it is worth enlarging upon." This is on the theory that most school teachers employ—drill it into the kids by constant repetition five days in the week for about ten years. That theory is woefully abused. Every brickmaker can see at a glance from last month's illustration that the nail was hit square on the head; that the plan is simple and commendable to common sense; that it don't cost any money and is a wealth producer.

Our yard has now burned six kilns on this plan, and in the six there has not been a melted arch at any point. We have not had use for crowbar or pick to break the connection of the bricks (in the language of the electrician). The brick have been uniformly "free," and, in addition thereto, we have never before had our bottoms so hard burned throughout the bench. The middle brick have all been hard clear up to the eyes at the ends of the arches. This means that the percentage of salmon has been materially decreased.

We have had a pile of clinkers on the yard for ten years past, which can be used only for water closet wells and other rough work. Each burn added thereto at least a few thousand, until they numbered perhaps 200,000. Yesterday they numbered less than 20,000. We sold the old ones and have stopped the production, and hope to never renew such a money loser.

Just think of it! Put six men on a stuck bottom, and they will be there a week, and knock, knock, knock away with bar, pick, hatchet, brick or piece of grate, and when they are done there is a lot of rough clinkers, maybe twenty thousand, and eight or ten cart loads of spauls! No wonder the town authority calls in for bats and spauls for roadmaking. All this can be saved, even with our easily melted clay, and in place of loss of dollars we shall be able to add to our pile thereby. This is attention to detail of business; it is one of the little leaks that, to some of us, has been a large one.

Some thirty years ago a relative of mine, having exhausted his clay bank, concluded to sample the adjoining land, and, among other places, burned a kiln of clay from the land that I am now using, and from which I have burned about twenty million brick. The result of his test was so disheartening that he closed up the business, his brick being run to a perfect slag, and this result, I have long felt, arose simply from making brick with too long a lever; too much of a "gentleman brickmaker;" his head and his hands did not get enough mud on them to be practical. To be sure, he was an up-to-date brickmaker; made brick by steam on a power press, and burned by fan blast in patent kilns, and not like the undersigned, simply a mudlark, with a little hand yard, making after the fashion of the Hebrews.

These things are well enough in their place, but success in business does not come from following the fashions of the day; it comes from understanding your line of trade, at least as well as your neighbors; it comes from just such details as indicated by setting your kiln bottoms open, and thereby producing a better condition of products. When a boy, my old boss

on the farm took me up on the hill and said: "Look around and you can see seventy farms, the best in Pennsylvania. When you are a man and go to farming, just look out from this hill, and never let any of these seventy best farmers in the whole world do any part of their cropping more than a day in advance of yourself." That is a good rule to live by and a good rule to die by, and the old boss, in short, simply meant, in common parlance, "hustle."

Aug. 7, 1897.

THE VILLAGE BRICKMAKER.

Business Improving at Pittsburg.

Editor Clay-Worker:

The brick business this season in Pittsburg has been somewhat of an improvement over the last few years. However, the brick manufacturers, in common with other business men in our great iron city, have not had as much reason to complain as those in other cities, for without doubt the hard times dealt more leniently with the business interests of Pittsburg than any other section of this country, thus showing the stability of our business men.

Quite a number of the brick plants have not turned a wheel for two years. However, in the last month most of them have started up again. As in many other sections of the country, we have a surplus of brick plants in prosperous times, and, with the increased output, keen competition may be expected.

In a recent conversation with the sales agent of the large firm of Booth & Flinn, he told me that from all indications they would run full time the rest of the year, making 100,000 brick per day. With their improved machinery and large capacity they can make their brick somewhat cheaper than others, which gives them control of the price and a large majority of the trade.

Prices have never been so low in our city as the past year or so. Some orders have been filled as low as \$5 per thousand. This may not seem low in some sections of the country, but considering the cost of making and burning of the Pittsburg brick, a very small margin remains—in fact, no margin at all for many.

But remember that Allegheny county is quite a State in itself, when a Republican majority is considered, and as our great President and new tariff mean prosperity, we hope to reap at least a part of the benefits accruing from a better demand and higher price.

I. C. B. M.

Pittsburg, Pa., Aug. 11, 1897.

Water-Pipe Grate Bars.

Editor Clay-Worker:

As no reply appeared in the July issue of the Clay-Worker to your correspondent, "A Subscriber," I venture a few suggestions on the subject.

To me it is not perfectly clear from the drawing that there is a combination of up and down-draft, nor can I perceive any advantage to be realized if such a combination did exist. What can it benefit the boiler by having the heat conveyed into the ash pit, and where is it conveyed to from there? I would also ask, By what means is the down-draft produced?

Your correspondent asserts that "down-draft will work where fire is not crowded, and also that it will burn the smoke." I can assure Subscriber that the non-crowding of a fire will not produce down-draft, nor will keeping the fire pushed back and adding fuel in front. As to this method burning the smoke, how often has it been shown in this magazine that the burning of smoke is practically impossible, and how many times will it have to be repeated? We must again challenge the idea that a furnace can consume its own smoke; that is simply impossible. We can construct a furnace to prevent the formation of smoke, but let the smoke once be formed and it cannot be consumed in the same furnace, its presence indicating that the furnace is wanting in those conditions essential for the complete combustion. I have used these few lines again and again since 1874, and nobody yet has accepted the challenge. No one has attempted to defend the idea of smoke burning, but still, at short intervals, one and another announces the advent of a smoke-consuming furnace, leaving it to be inferred that they either ignore or distrust the teachings of science, or that they have discovered a way of circumventing it. Never were they more mistaken. But Subscriber asserts that "it is a demonstrated fact" that down-draft and smoke consuming may be attained by the methods mentioned above. I am afraid Subscriber does not realize the full meaning of demonstrated fact, or was not quite as careful as he ought to have been when

he penned his letter. However, if he feels quite sure about it, he can, perhaps, tell us where and when this demonstration took place.

There are several water-tube boilers on the market which have passed the experimental stage long ago, and they appear to be the boiler of the future. Most of these use tubes of from three to five inches diameter. The tubes are set at an angle of about 45 degrees, and are as thin as is consistent with strength. I mention this for the sake of contrast. True, the boiler for which Subscriber stands sponsor is not in the question; only the grate.

If, as appears from the drawing, the pipes are horizontal, they would soon choke up with mud; they could not very well be better placed as mud catchers. Now, let us see about it being a great steamer. With pipes one inch internal diameter, and, say, three-sixteenths of an inch thick and half-inch spaces, as suggested. In a grate six feet long by four feet wide we would get twenty-seven pipes, and allowing half the circumference of these pipes to be heating surface, we get about twenty-eight feet, but we can scarcely allow so much for effective heating surface, as the bars (pipes) would be covered with dead ashes more than half the time. However, allowing that one-half the circumference of the pipes is continually receiving the full benefit of the fire, we should get about 2-horsepower out of such a grate. I would not venture an opinion as to how long the grate would remain intact after firing up. I have seen cast-iron hollow grates through which water circulated, but I never knew them to be used continuously for more than about a year, then abandoned. Water-tube boilers, as I said above, are "the" boilers, but water-tube grates do not strike me favorably.

WM. WAPLINGTON.

The Situation in Chicago.

Editor Clay-Worker:

The month of July has closed, leaving the same gratifying outlay with which it began, so far as the general prospect for an increase in business is concerned. It seems to be an indisputable fact that the crops are bountiful, and are to be sold at prices that will show a large ratio of profit to the farmer and the dealer, as well as for the transportation companies. The foreign demand continues, and if reports as to shortages abroad are true, of which fact there seems to be little or no doubt, it must continue. Under these conditions the whole country must, ere long, feel the effect of an increase in all lines of business. The application of the new tariff has already had the effect of stimulating prices in many lines. Perhaps the most important fact in relation to the tariff is that prices may be depended upon to remain stable.

An evidence of returning prosperity and how the promises of it are having an effect is manifested in the fact that some enterprises which have been under contemplation for some time are now going ahead. The Eckhart & Swan Milling Company are preparing to begin the construction of a mill and warehouse on Carroll avenue, near Ada street, the cost of which will be close to \$300,000, and will cover an area of over 44,000 square feet.

The H. W. Johns Manufacturing Company, the largest manufacturers of asbestos goods in the world, are contemplating the construction of a large plant at Chicago Heights, and plans for the same are now being made. The company will erect three buildings, the main building, for manufacturing, to cover 260x80 feet, and two warehouses, one being 224x80 feet in area and the other 80x96 feet, all to be constructed of brick.

The Inland Steel Company has plans made for a four-story basement store, office and theater building, to be erected at Chicago Heights. It will cover 60x102 feet, and will be constructed of pressed brick and stone trimmings. It will be of fire-proof construction, and will cost about \$65,000.

The building statistics for July show that permits were taken out for the construction of 414 buildings, extending over a frontage of 10,435 feet, involving an expenditure of \$1,070,900. This is a decrease of 120 in the number of buildings, 2,383 in the number of feet frontage and \$189,750 in cost, as compared with the corresponding month last year. During the early part of the month operations were upon an exceedingly limited scale, but during the past week or two there has been some increase, which it is thought will continue.

Of the buildings for which permits were taken out, 169 were one story high and 170 were two stories and basement high, there being sixty-seven three stories high and eight four stories high. Dwellings and flats were, of course, the most numerous, for the construction of which 278 permits were issued. Twenty-four were for stores and dwellings and twenty-five for stores exclusively; ten were for factories and warehouses, two for

churches, six for public and office buildings, nine were for barns, two for miscellaneous structures, and fifty-one comprised additions and alterations. **TEMPERED CLAY.**

Down in Jersey.

Editor Clay-Worker:

News from this section is rather scarce. As far as I can learn the factories are all running. Some shipments are being made, but not as much as there should be for this time of the year.

One morning recently, while crossing the sound, we noted five large barges of red brick being towed up the sound. Our friend, Capt. Samuel Hornsby, who does a lot of this work with his line of schooners, happening to be on board the ferry, I asked his opinion as to the quantity of brick on board the barges. He estimated the total at 1,000,000, a large shipment, truly. Red brick are passing up the sound daily from South river ports. Prices about the same as last month.

For July we had sixteen inches of rainfall, which no doubt caused the summer yards lots of trouble and plenty of washed brick.

Business generally is better. We ourselves have never been busier since establishing ourselves in this neck of woods. Building is quite brisk in this city, and, with the completion of an electric road from New Brunswick to this city, which we are promised now, no doubt we shall have a great many more buildings erected next season.

The Staten Island Terra Cotta Lumber Company, lately in the hands of receivers, has been transferred by Court of Chancery to Mr. Addicks, the gas king. Mr. A., being the heaviest stockholder, as well as debtor, of the old company, offered to give \$100,000 for the plant, assuming, we believe, all the mortgages, as well as any obligations made by receivers and company. This was accepted by the court. This sum will pay about 17 per cent. to old creditors. We are glad the sale has been made, for certainly there is too much capital tied up in this plant to allow of its standing idle. We hope to see shortly a big resume there.

We are informed that the Standard Fire-proofing Company, Robert Lyle, Manager, has branched out into the manufacture of enameled washtubs, and are also preparing, by the erection of a very large building, to manufacture an earthen bathtub. The promised data for a descriptive article of this plant has not materialized as yet. We judge that Brother Lyle, like ourselves, is too busy trying to keep up with the increase in business to bother with such little things.

Our friend Edgar is very busy shipping clay, but oh, my! didn't the clay men have to pump water after the deluge of a week or so ago!

The Watson Fire Brick Company have a young lake in their pits. The writer expects, after the water is out of these pits, to sink a pipe to sands underneath the clays to allow the water to run off. In other words, it will be an inverted well. Instead of pumping water out of the pipe we will allow it to run down from the surface. There is no patent on this, and if any of your many readers are troubled with wet pits, I shall be glad to enlighten them on the plans proposed in this case.

Perth Amboy, Aug. 11, 1897.

W. R. O.

Prefers American Machinery.

Editor Clay-Worker:

It may interest some of your readers and actual and prospective advertisers to know that our syndicate (which has a general machine, tool and engineers' supply business, in active running order) is about to start a department, under special management, for brickmaking machines and kindred matters, and that so long as American manufacturers can make export prices which will permit sales, and can deliver promptly, they will be given the preference while I have the selection of the agencies. But they must understand that on such heavy ma-

chines the freights and duties make it imperative that the export prices be very much lower than for domestic markets.

ROBERT GRIMSHAW,

Director International Engineering and Trade Syndicate,
Dresden, Germany.

A SUCCESSFUL PAVING BRICK PLANT.

John C. Shea, Superintendent of the Gem City Paving Brick Company, Quincy, Ill., writes that the brick business in their quarter is quite brisk. The demand for sidewalk brick is good, and they now have orders ahead for 3,500,000 pavers, to be put down in the streets of Quincy. They get a fair price for the brick, but fuel is so expensive and the clay so hard to burn that their profit is much less per thousand brick than is realized at plants at Decatur and Danville in which Mr. Shea is also interested. The Gem City Paving Brick Company is the successor of the Hutemacher Brick Company. Mr. Shea took charge of the plant in 1895 and remodeled it, and began the manufacture of paving brick. Previous attempts in Quincy had been unsuccessful, but they have experienced little or no trouble. They have ten Shea-Crumlick down-draft kilns, having a capacity of 40,000 each, and a drying capacity of 300,000, half steam and half outdoor drier. They made 3,000,000 pavers last year, and have already made 4,000,000 so far this year. They make a very dark vitrified brick which Mr. Shea considers first-class.

A DISASTROUS RIDE.

W. J. Woolley, Secretary and Treasurer of the Woolley Foundry and Machine Works, Anderson, Ind., is laid up for "repairs" as a result of a bicycle accident. Mr. Woolley is a wheelman of large dimensions and considerable enthusiasm. Having business here in the Hoosier capital, he brought his wheel with him and started out to sample our boulevards, which are the delight of riders. An inconsiderate pedestrian blocked his way, and friend Woolley, as a result, is nursing a fractured rib. He regards the incident complacently as "one of the accompanying pleasures of cycling." He expects to be up and about again in a few days.

AN ART TILE COMPANY'S DEMISE.

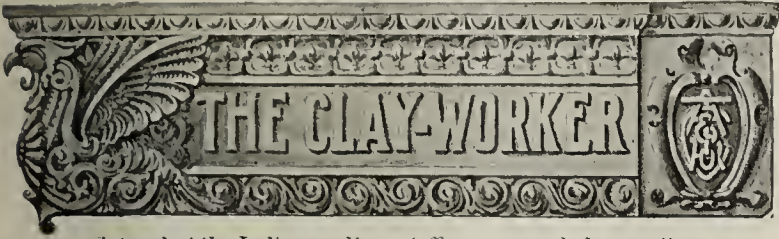
Ohio C. Barber, Geo. Crouse and Chas. Baird have brought suit against the stockholders of the Kirkham Art Tile Company, Akron, O. They claim to be creditors for \$50,000, \$14,000 and \$10,000, respectively, and set off for \$40,000 more.

The tile works were destroyed by fire in 1893, since which time the company has done nothing and is now insolvent. Last winter a combination was effected with a company at Trenton, N. J., by which the works should be rebuilt, but the deal fell through.

The plaintiffs ask that a receiver be appointed and the company wound up. It was capitalized at \$300,000.—Cleveland Press.

CLAYWORKING MACHINERY FOR MEXICO.

As previously announced in our columns, the City of Mexico is to have an immense sewer pipe manufactory. Some time since it was stated that the order for the necessary machinery had been given to St. Louis parties. This, it seems, is not the case. The American Clayworking Machinery Company, Bucyrus, O., are the lucky manufacturers who captured the plum. They will, it is claimed, furnish all the machinery necessary. This is the largest order for clayworking machinery that has been let for a number of years. It will take seven or more freight cars to transport the equipment to the City of Mexico, where it is hoped to erect it and have it in operation in a couple of months.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " " " " " "	10.00
Ten copies, " " " " " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVIII. AUGUST 1897. No 2.

TIMES STILL IMPROVING.

Every business interest indicates a healthy improvement of the commercial interests of the country. Of course, those who wish to make political capital out of untoward events or to justify their own slipshod methods fail to recognize present and coming prosperity. Nevertheless, the volume of business in every department is steadily increasing. Good crops, with improved prices, encourage the farmer, larger shipments encourage the railroad, more money to spend for goods encourages the merchant, and the greater demand for goods encourages the manufacturers, and he gives more steady and remunerative work to his men and women, who, in turn, buy farm products and store goods more lavishly, and thus the circle of help-one-another is kept up. Almost the only exception are the chronic grumblers, who never did see good times, or don't know them when they do see them. Prices, of course, are low, compared with the boom period, but they are relatively the same as then; that is, a given number of hours' work will buy about the same amount of necessities and luxuries that it would in the boom times, the only real sufferers being those who have old debts to liquidate or property to be taxed. Official salaries have not been cut down, and notes are liquidated by dollars and not by days' work.

THE SOLUTION OF THE LABOR PROBLEM.

An octogenarian, who sometimes talks economics in our sanctum, when speaking of the miners' strike, remarked the other day that there is nothing in it as a solution of the labor problem, except that it is to be another demonstration that the remedy for the ills we suffer does not lie in the direction of labor combinations and labor strikes, but exactly in the other direction. Whatever may be the immediate outcome of this strike, the question which lies back of it will still not only be unsolved,

but the suffering incident to the artificial derangement of productive industries we are now wrestling with will be intensified. Notice: the essence of their complaint is a lack of labor; they are employed only about two days in a week. The rate of wages would not be fatal if they could find work for six days instead of two. You see, there is a stubborn fact—yes, two of them—lying back of this condition, for which mine owners and mine operators are in no sense responsible. The world's demand for coal is limited by a law that is as unrepeatable and as inexorable as the law of gravitation. How much it has been affected by the discovery of natural gas it may be impossible to estimate, but in large districts it has practically superseded coal entirely. To this add the improved methods of utilizing heat so that much less fuel is needed for given results, and you have an element which disturbs the demand for coal, lessening it nearly 50 per cent. Taking into account the improved machinery which is used in mining, it is not extravagant to estimate that relatively not over one-third the amount of manual labor is needed to supply the world with coal which was needed fifty or sixty years ago. In other words, the market for coal is so limited that it can be supplied with one-third the laborers who seek employment in the mines.

* * *

A CASE OF DEMAND AND SUPPLY.

Continuing, our octogenarian added: "It is easier to prescribe the remedy than it is to take the prescription, for, in truth, a great many of the sufferers would rather endure the ills that are upon them than to heroically apply the only antidote, especially if they can enlist public sympathy in the way of material relief or create a sensation by marching upon those who want to work. There is not one-fourth the manual labor required in any department of business there was fifty years ago in the production of given results. More than four times as many hours of hard manual labor was bestowed on a hundred bushels of wheat before it reached the average consumer than is now. That means that three out of every four farm laborers have been turned out of employment as farmers just as these miners have been. What did they do about it? Some pouted and sulked and joined the army of tramps and went to the bad; some hied away to the city to pick up a job here and there, and vote for the councilman who would be most reckless in ordering public improvements, but none of them struck or tried to be supported as farmers of charity. Even the women have been affected by labor-saving machinery. Carding and spinning and weaving and sewing, and even cooking, have been modified or abolished as a home employment, for the modern cooking stove is a labor-saving machine of no mean production, and the baker makes "home-made" bread for the million. One result of this, which is not often taken into account, has contributed to hard times among men. Look at the army of women who are doing what used to be men's work. Even in the office of the Clay-Worker they have driven out less competent men, who are out of a job now and are compelled to hunt up something to do, and they are having a hard time to find it. The mines are oversupplied, and there is no need of miners on the farm or in the trades. For awhile they took to law or medicine or the pulpit or politics, but women have broken into all of these, and they threaten to monopolize them, as they have school teaching and clerking in stores and offices. Aias! for the men! Let me tell you, the worst has not come, and miners are no worse off than other people. Suppose everybody should strike who cannot find employment at remunerative wages and full time in the particular industry they would choose, and appeal for help until they could coerce the world to buy their output, when the world really had no need for it. Would that solve the labor problem?"

* * *

GOOD-BYE, DOBBIN.

It used to be considered the perfection of cruelty to turn an old horse out to die, but steam and electricity have reduced even the young horse to the point of starvation. The six-horse team of the fathers disappeared long ago, for it could

not compete with the iron horse of the railroad, but there was still a place for the farm horse and the light draught; but now that the electric car threads every street and avenue, and the wheel is available for all purposes, the demand for horse labor had already so minified the noble animal that the market price of the very best was merely nominal, when now comes the horseless carriage, propelled by electricity, and as manageable by a woman as the family horse, needing no grooming and needing no more repairing than the horse's shoeing, and never getting weary, though always tired. Alas! for the horse! Out of a job. The miners are to be pitied, but is their condition worse than that of other people? Labor-saving machinery has diminished the demand for manual labor in every industry known among civilized people. The profession of law, the medicine and theology and politics have suffered less than anything else, but the want of employment in other industries has so crowded these that there is not elbow room for half of those who seek them. Doctors in Indiana have obtained a kind of protective tariff in their own behalf, but not so with the preachers and lawyers and politicians, though many of them are on the point of starvation, not even getting two days' full work in a week, and wages miserably low unless they are among the elect.

* * *

WHAT ARE WE TO DO ABOUT IT?

Our venerable octogenarian answered this question by an object lesson. "About twenty years ago a former slave came to Indianapolis. He was at least fifty years old, but was ambitious to own his own home. He found a small house for sale on monthly payments, allowing him ten years to pay for it. He undertook it, and never missed a payment in the ten years. I asked him one day how he managed to always have money when so many of his people were so hard up. 'I works for it,' he said, 'and when I gets it I saves it. You see, I's a gardener by profession. I was not up at the bizness. I's worth a dollar and a half in any man's garden, and at first I got it in the gard'nin' season; but some days I couldn't, then I'd take a dollar and a quarter, and if I couldn't get that I'd take a dollar. I didn't care whether it was according to my profession or not, so I got the dollar and done the work. Sometimes I couldn't get over 50 cents, sometimes only a quarter, but never a day but Sunday that I didn't get a quarter at least. I'd go around and see a job other folks wouldn't take for less than a dollar. I'd ask a half dollar, then a quarter, and I always fotched him at a quarter. You see, while the other fellow was a-loafing around, a-getting nothing, and maybe spending money for beers, I was a quarter ahead at night, and slept as well or better than he did. A quarter ahead, besides what I didn't spend for beers and 'backer. That's how I always has money and how I has my house paid for and money in bank for a case of sickness.' That old North Carolina negro had the only key to the solution. If you can't get coal mining or anything else in your 'profession,' do something not in that line, and if you can't get a dollar and a half take a quarter. Some people can't afford to pay more than a quarter. It is the bottom mistake in this labor question that all employers are wealthy people. When that old ex-slave's theory permeates the whole industrial system the labor question will be solved."

THE UNATTAINABLE.

Brother Waplington's perplexity, as voiced in his interesting contribution on another page, entitled "Reliable Information," is somewhat anticipated in the philosophy of our octogenarian friend, which was uttered before Mr. W.'s communication came to hand. It may be true that he has had to unlearn many superficial things that were taught as truths in his childhood, but fundamental truths remain, though the methods of expressing them may have changed. Two and two always and everywhere made four, though in England, in his school days, the arithmetic said "two times two are four," while our primary arithmetic takes the American short cut, "twice two are four," and our venerable English friend would be laughed out of an

up-to-date American grammar school if he should quote Lindley Murray, "The verb must agree with its nominative," while the linguistic truth it is meant to state is always the same, though expressed so differently here that an American grammar scholar would hardly know what he meant by his old English "nominative." Long before our distinguished correspondent shall have lived another seventy years he will have to knock the "veneering" off a great many isms that are yet, in some places, promulgated as truths, and among them that cheap dogma that it is the duty of the government to create such a demand for every article of commerce that no man shall ever be idle or work at reduced wages. Without the demand where is to be the market? If there is any other road to prosperity than learning to adjust ourselves to the inevitable relation of supply and demand, the Clay-Worker would be happy to proclaim it for the benefit of those who are eternally at war with this law and who never intend to bow to its behests. Possibly this human enactment or that may temporarily affect prices of labor and its output, but it is only to provide for a Johnstown flood when the unvarying law of supply and demand shall defy the artificial conditions and assert its supremacy, as the unvarying law of gravitation defied the artificial obstruction, and waters, pent up for a season, swept the valley below. The sufferers, instead of rebelling against the law of gravitation, set about "adjusting themselves to the conditions," and a stranger passing up the valley now would hardly ever suspect such a disastrous flood as swept away such beauty and wealth only a few years ago. Until this law is repealed the Clay-Worker knows no better way to regain prosperity than to adjust ourselves, one and all, to present conditions. If Brother Waplington can suggest a better remedy, we will be glad to have him do so, but would like to take it in broken doses.

LOW PRICES IN MILWAUKEE.

It is reported that the Milwaukee Brick Company is selling brick at \$4 per thousand, a figure at which brick have never before been sold in Milwaukee. Competing companies, it is claimed, will not meet the price, as they say it costs more than that amount to make brick from Milwaukee clay, which is difficult to burn. It is the latter fact which enables Chicago manufacturers to compete with Milwaukee manufacturers in their own market, though freighting their product nearly one hundred miles. Common Chicago brick are burned in from three to four days, while it takes twelve or fourteen days to burn Milwaukee brick.

A NEW CLAY PRODUCT.

A new use for clay in the form of glazed shale cattle guards is being introduced on the Cleveland, Canton & Southern Railroad, according to the Cleveland Leader. The Leader says:

"Vitrified shale clay, glazed, is being successfully used as cattle guards on the Cleveland, Canton & Southern Railroad. The new material, being stable, durable and inexpensive, will likely be adopted universally—not immediately, but gradually. Railroad officials have found cattle guards made of wood or metal unsatisfactory, it is said, for several reasons. It has been found necessary to replace the old-fashioned protectors frequently, and careful watching is required to keep them in repair and in position.

"About a year ago the C., C. & S. Company experimented with the vitrified shale guards, and the success that has attended their use has induced the management to adopt them on all parts of the line. Railroad officers state that the new invention promises to supersede the systems now in use, many advantages being claimed for the glazed vitrified shale clay. It is said to be less expensive than wood and to cost about a fifth of what iron guards cost, a feature which is advantageous in these days of economical railroading. The guard is composed of short sections, fastened together with iron rods if desirable, but this is not considered necessary. Being glazed, they do not need painting, and rains and winds keep them clean. The manufacturers of the guards have decided not to build a factory, but to send dies to a brickyard near where the order goes, thus saving transportation charges. It is claimed that almost any brickyard can make them when furnished the dies. The manufacturers are Cleveland and Canton men."

These guards are made on the machines of the American Clayworking Machinery Company, of Bucyrus.

THE BOOKS YOU USED TO READ.

What were the books that you used to read?
Which were the first you knew?
Whose was the page with its wondrous seed,
Seed of the will to do?
Who wrote the words that in printer's ink
Stared from the pages to make you think?

Have you the books that you used to thumb?
Wonderful storehouses then;
Filled with such treasures as never will come
Back to your eyes again;
For the eyes which the dear old volumes knew
Were as fresh as a flower that is spent with dew.

Tell me the books that you used to know
Back in the dear old home,
Sheltered by trees that were bending low
And by the vines that clomb,
Making, perhaps, a secluded nook
Just for you and your favorite book.

What if their linen be soiled to-day?
What if their coats be torn?
Friends are still friends if the hair be gray
Or if the clothes be worn;
And they will ever seem stanch and true—
These, the friends that in youth you knew.

Do you not know what they told you then,
Even the page and line?
Could you not turn to it now, as when
You were a child of nine?
And in your eyes would the words not glow
Just as they did in the long ago?

Dear were these friends when such were few;
Dear are they still, I know;
Tomes that are stately and rich and new
Laugh at the long ago,
But into your favor shall never come
As did the books that you used to thumb.

—Osman C. Hooper, in the Bookman.

A NEW BOOK ON THE MANUFACTURE OF BRICK AND OTHER BUILDING MATERIALS.

We have before us the first part of a new German work, a manual of the manufacture of brick, comprising, also, the production of terra cotta, tiles, refractory ware and all other building material made out of clay. The author is Mr. K. Duemmler, architect, and editor of the German Brick and Pottery Gazette, assisted by Mr. Frederick Hoffmann, the well-known inventor of the continuous kiln. The treatise is being published on the subscription plan, and will appear in sixteen paper-bound volumes. In the first part the history of brickmaking is treated in a vigorous, attractive style, copiously illustrated with half-tone cuts of old buildings. Following this introduction to the subject, the different kinds of brick, hollow brick, roofing tiles, etc., are described and fully illustrated, due credit being given to American hollow blocks, fire-proofing and roofing tiles. To judge from the first part of the series, the work promises to be a valuable addition to ceramic literature, and the name of the author is in itself a guarantee that the subject will be treated in an able manner. The publisher is Wm. Knapp, Halle, Germany, and the price per volume, about thirty-two pages of excellent paper, is 50 cents.

J. B. Jourdan, Brenham, Texas, would like to correspond with parties desiring to establish brick and tile plants in Mississippi and other Southern states.

WANTED—Situation as general manager, by a first-class Potter's Chemist with years of experience, understands all details of the business, can superintend and furnish formula's for the making of C. C. White Granite, Porcelain, Vitrified and Bone China, also all kinds of Colored Glazes for tile and brick. Bristol glazes for stoneware. Highest references furnished as to ability etc. Address
8 tf d m J. B., care Clay-Worker.

A BIG BARGAIN.

Forsale cheap—a well-equipped brick plant in Northern Wisconsin; no other plant within 50 miles; clay burns red and there is an abundance of it; good railroad facilities, forty acres of clay land and large amount of timber suitable for fuel. A fine opportunity for a young brickmaker to start for himself. For full particulars, address
7 tf d WALLACE, care Clay-Worker.

MICHIGAN COLLEGE OF MINES.

A State technical school. Practical work. Special facilities for men of age and experience. Elective system. 45 weeks a year. Non resident tuition \$150 a year. For catalogues, address
82 a DR. M. E. WADSWORTH, President, Houghton, Mich.

TABLE OF CONTENTS.

Making Brick by Dry Clay Process	95	The Raymond No. 4 Paving Block Press.....	121
Historical Sketch of the Phoenixville (Pa) Pottery.....	96	A Successful Paving Brick Plant	124
The New York Market	98	An Art Tile Company's Demise ..	124
Watersmoking and its Effect upon the Brick	101	Clayworking Machinery for Mexico.....	124
In Philadelphia Brickyards	102		
The Development of Hollow Block Manufacture.....	103	CORRESPONDENCE:	
Making Press Brick in Utah.....	105	"Hack—Stack".....	122
Pennsylvania's Clay Deposits ..	106	Clayworking Literature.....	122
Vitrified Brick—Their Manufacture and Advantages as a Paving Material.....	106	The Village Brickyard—Coming out from Among the Clinkers.....	122
The Potter's Art.....	108	Business Improving at Plttsburg	123
Seger Cones.....	111	Water-Pipe Grate Bars.....	123
German Notes.....	114	The Situation in Chicago	123
The Simpson Brick Press Company's New Plant.....	115	Down in Jersey.....	124
Southern California	115	Prefers American Machinery... ..	124
Ancient Pottery Unearthed by a Workman.....	115	Pacific Coast News.....	140
How Some Brickmakers cut Prices.....	116		
A Process for Producing Blended Ground Colors on Pottery Alleged to be Infringed	116	EDITORIAL:	
Decatur gets the Illinois Convention	116	Times Still Improving.....	125
Brickyard Sketches.....	117	The Solution of the Labor Problem.....	125
Button-Hole Talks—Gates Accused of Talking too Much ...	118	A Case of Demand and Supply. 125	
R-3 Double Mold Repress.....	119	Good-bye, Dobbin.....	125
An Opportunity for Capital	119	What are we to Do About It? ...	126
Waiting for the Wave.....	119	The Unattainable.....	126
Preparation of Clay for the Dry Press Process	119	Low Prices in Milwaukee.....	126
Horses Like Brick.....	119	A New Clay Product.....	126
Suggestions for Advertisers.....	119	Editorial Notes and Clippings..	138
Reliable Information	120		
		MISCELLANY:	
		A Disastrous Ride	124
		The Books You Used to Read... ..	127
		A New Book on the Manufacture of Brick and Other Building Materials.....	127

Index to Advertisements on Next Page.

Books for... Brickmakers.

"CLAY GLAZES AND ENAMELS,"	
Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	
Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	
J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	
Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	
H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	
J. J. W. Billingsley,	1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,

Indianapolis, Ind.

INDEX TO ADVERTISEMENTS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page
Progress Press Brick and Machine Co.....	141	The Chisholm, Boyd & White Co.....	88
Ross-Keller Brick Machine Co....	91	The American Clay-Working Machinery Co.....	142, 144, 156, 165
Simpson Brick Press Co.....	89	The Fernholtz Brick Press Co..	90

Brick and Tile Machinery.

Anderson F'dry & Mach. Wks.....	162	The American Clay-Working Machinery Co.....	142, 144, 156, 165
Baird & Son, H. C.....	148	The Horton Mfg. Co.....	128
Brewer, H. & Co.....	151, 163	The Eastern Machinery Co.....	166
Central Machine Works.....	144	The Henry Martin Brick Mach. Mfg. Co.....	161
Chambers Brothers Co.....	85, 159	The Leader Mfg. Co.....	159
Chicago Brick Machinery Co.....	157	The Ohio Ceramic Engineering Co.....	86
Eagle Iron Works.....	144	The Turner, Vaughn & Taylor Co.....	145
Freese, E. M. & Co.....	164	The Wallace Mfg. Co.....	167
Frost Engine Co.....	160	The Wellington Machine Co.....	139
Hensley, J. W.....	147	Williams Patent Crusher and Pulverizer Co.....	92
Kelis & Sons.....	148	Wiles, A. M. & W. H.....	153
Means & Co., Jas.....	145	Woolley Foundry & Machine Works.....	158
Michigan Brick and Tile Machine Co.....	147	Williams, White & Co.....	156
Madden & Co.....	150		
Newell Universal Mill Co.....	158		
Potts & Co., C. & A.....	93		
Raymond & Co., C. W.....	129		
Stedman's Machine Works.....	153		
Steele, J. C., & Son.....	153		

Brick Kilns and Dryers.

Aisip, S. H.....	152	Reppell, L. H.....	152
Conley & Wolfe.....	154	Sharer, Geo. W.....	154
Cummer & Son Co, The F. D.....	141	Swift, F. E.....	146
Eudaly, W. A.....	155	The American Blower Co.....	142
Leary, W. A.....	146	The Fernholtz Brick Press Co....	90
Morrison & Co., R. B.....	155	The Standard Dry Kiln Co.....	94
Pike, E. M.....	143	Wolff Dryer Co.....	168
Phillips, S. G.....	151	Yates, Alfred.....	147

Brick Yard Supplies.

Arnold, D. J. C.....	86	The Atlas Bolt & Screw Co.....	150
Coldewe & Co., G.....	149	The Buck Machine Company ...	148
Carnell, Geo.....	152	The Harrington & King Performing Co.....	87
Cox, Geo. S.....	149	The Henry Martin Brick Machine Mfg. Co.....	161
Caldwell, H. W. & Son Co.....	145	The Keystone Brick-yard Supply Company	146
Carmichael, T. W.....	150	The Pittsburg Mineral Screen Company.....	143
Hardin & Church.....	142	Wagoner, M. V. B.....	149
Marion Steam Shovel Co.....	157	Walworth Run Foundry Co.....	151
Mey, F. H. C.....	143		
Mershon & Co., W. B.....	87		
Newton, A. H.....	149		
Phillips & McLaren.....	147		

Miscellaneous.

Associated Trade & Industrial Press.....	146	Kendall & Flick	144
Big Four R. R.....	150	Lake Erie & Western.....	148
Cincinnati, Hamilton & Dayton R. R.....	151	Main Betting Co.....	146
Chesapeake & Ohio R. R.....	149	Monon Route.....	149
Dean Bros. Steam Pump Works	144	Osborne, W. R.....	145
Dover Fire Brick Co.....	148	Ropkey-Mason Engraving Co..	147
Evens & Howard.....	147	Tennille, A. F.....	148
International Correspondence Schools.....	151	The E. W. Vanduzen Co.....	149
Indiana, Decatur & Western ...	151	The Union Hardware Co.....	149
Illinois Central R. R.....	150	The Jeffrey Manufacturing Co...146	
Jackson, John H.....	148	The Rockwood Mfg. Co.....	149
		Vandalia Line	150
		Westbrook & Wells.....	148
		Small Ads., Wanted, For Sale, Etc	

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

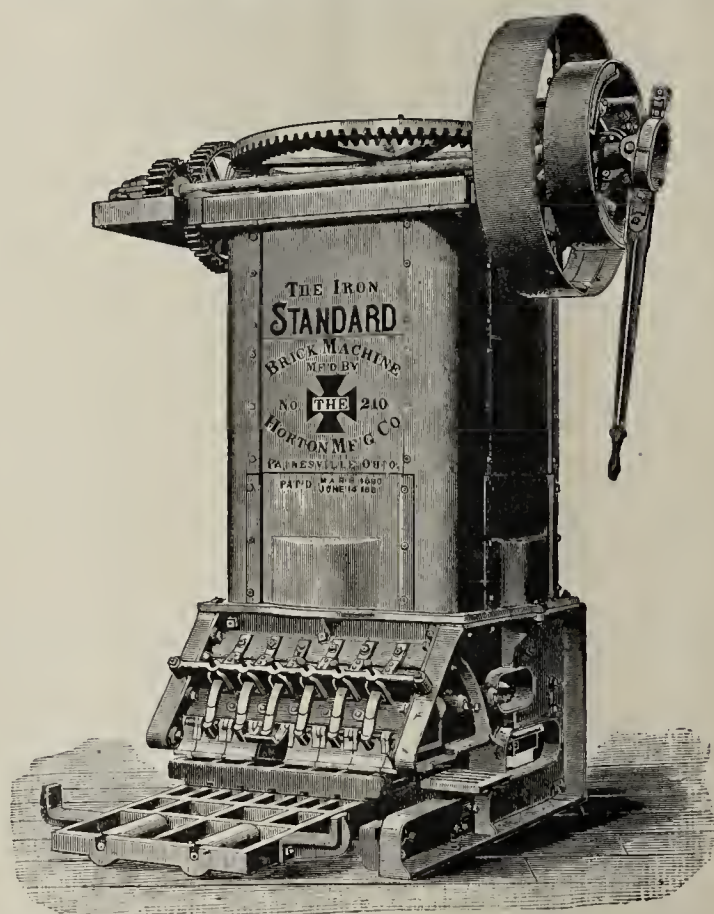
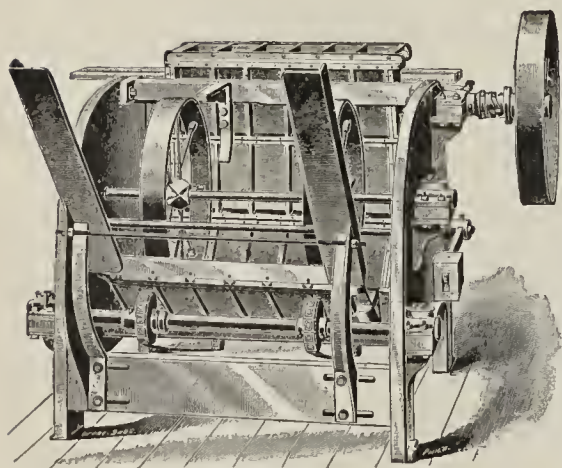
Mention the Clay-Worker

Why Not

Buy a **STANDARD** when in need of a Brick Machine. We guarantee them to make as many first-class brick as any machine of its class on the market.

Our Mold Sander is a practical machine and will last for years—do not compare it with those cheap, flimsy machines now offered to the trade.

If in need of supplies or machinery write us before placing your order.



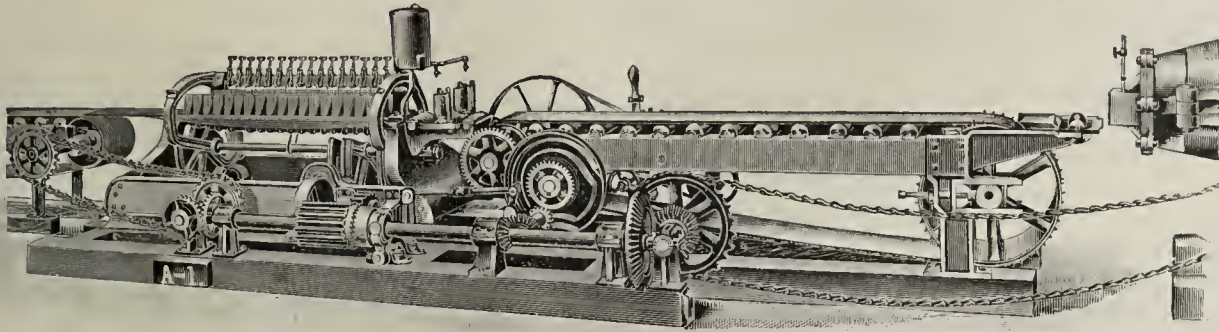
One second hand Columbian Special Repress for sale at a very low figure. Practically as good as new.

The Horton M'f'g. Co.,

Mention the Clay-Worker

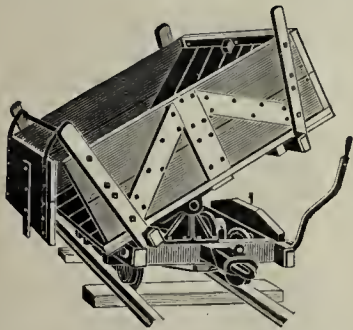
PAINESVILLE, OHIO.

Yes Sir-ree! We Make 'em all, We do!

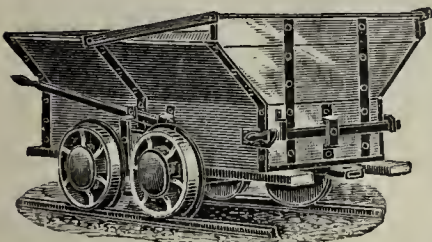


Automatic Side Cutting Table.

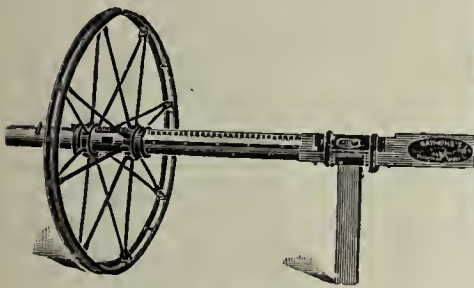
An' we make a whole lot more besides,



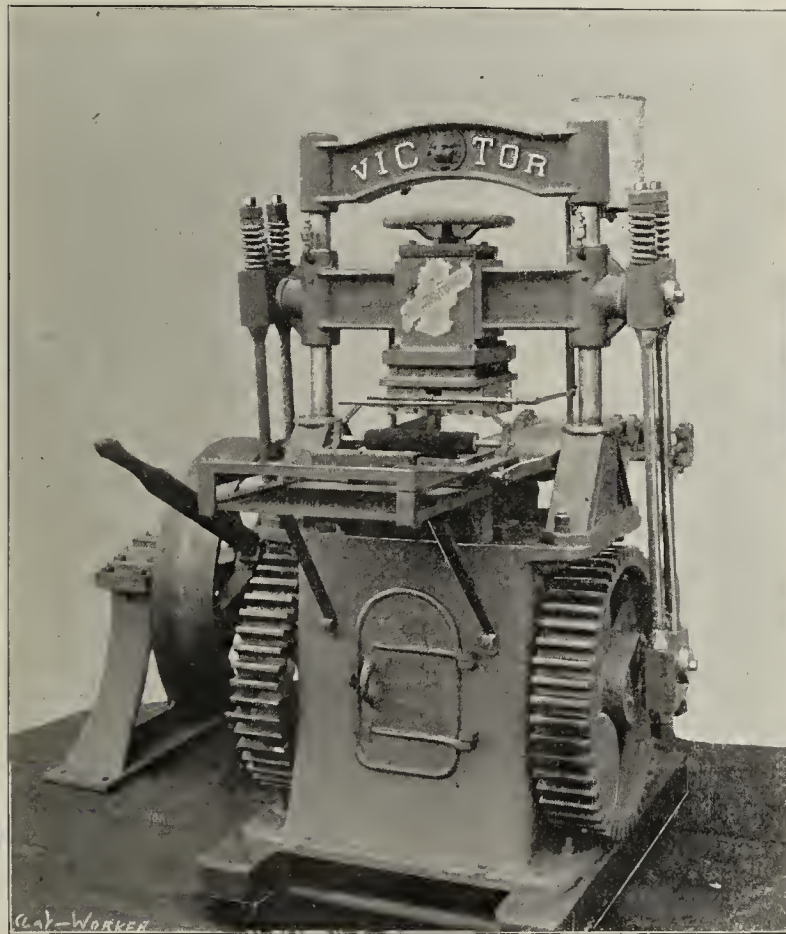
Automatic Dumping Car.



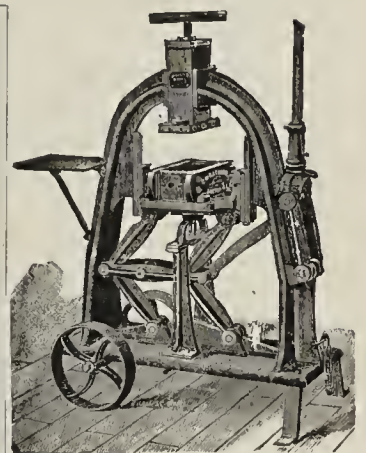
Bottom Dumping Car.



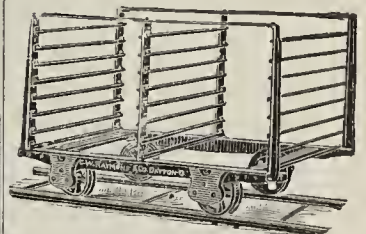
Wrought Iron Tempering Wheel.



The Raymond "Victor" Reprass.

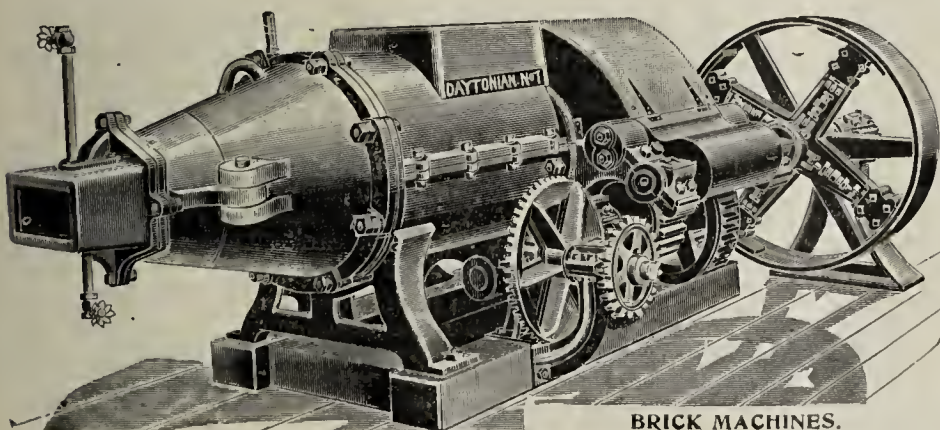


Perfection Brick Press.



Dryer Cars.

Ef you don't believe it just send for our catalogue.



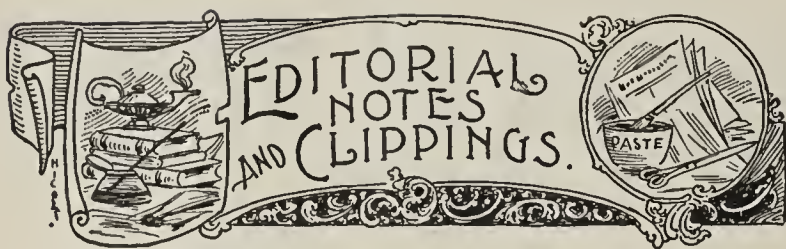
BRICK MACHINES.

We Sell 'em too like hot cakes.

...

**C. W. Raymond
& Company,**

Dayton, Ohio.



E. M. Phillips is going to start a brickyard at Little Rock, Ark.

Fred Engelhart has purchased the brickyard at St. Johnsville, N. Y.

Geo. Harriman, of Adena, O., has purchased the Jewett (O.) Brick Company's plant.

The Sebring Pottery will erect a factory for the manufacture of teacups at East Liverpool, O.

The brickyard of J. J. Mabbett, Herkimer, N. Y., was sold at public auction to P. J. McWennie for \$5,600.

The employes at the Thomas Pressed Brick Works, Winnebago, Calhoun county, Illinois, are out on a strike.

The Monticello Brick Company, Clarksburg, W. Va., has secured a contract for 1,500,000 brick for a crematory at Weston.

Chas. L. Krager, Chattanooga, Tenn., is putting up a pottery at that place, which he expects to have in full operation by October.

S. C. Long, Hampshire, Tenn., would like a good partner to go into the brick business with him. He is now in the market for machinery, etc.

A fire in the brick works run by J. S. Sanderson, Springfield, Mass., caused a loss of \$1,000. The flames were largely confined to the boiler room.

T. J. Halstead, 110 North Tejohn street, Colorado Springs, Col., is in the market for a second-hand two-mold dry press machine, a Boyd preferred.

Chas. Berrick, of Buffalo, N. Y., has purchased a tract of land from Jas. Doty, at Attica, N. Y., on which he will establish a large face brick plant.

Albert Wirz, Manager of the Empire Press Brick Company, at Denton, Tex., writes that he wants a couple of good men to set and burn dry press brick.

Robert Whittaker died at Parsons, Kan., July 8, after a lingering illness. He had been engaged in the brick business at Parsons for twenty-seven years.

Business is booming with the Ontario Paving Brick Company, Toronto Junction, Canada. They have on hand now orders for more than 6,000,000 brick.

The brick works of the Clearfield (Pa.) Machine Shops (Ltd.), also the brick plant at Woodland, Pa., are running at their full capacity to keep up with their orders.

Jno. P. Russell, Brisbane, Australia, is in this country, investigating brick and tile machinery, with a view of purchasing a complete equipment for his brick plant.

The Hutsonville (Ill.) Brick and Tile Company wants a good, practical man to set up machinery. They also want a good superintendent. They have a Freese machine.

J. J. Sabins has purchased the machinery of the Standard Brick Company, at Fostoria, O., and has shipped it to Shelby, at which place he will open up a new brickyard.

A. A. Graves, Winooski, Vt., reports the brick business good in his vicinity. He has recently booked an order for 1,000,000 brick to be used in the construction of a government building.

The brick and tile plant of J. N. Boling & Sons, Stanwood, Ia., was burned to the ground July 15. The loss is about \$9,000, with \$4,000 insurance. The origin of the fire is unknown.

J. Burke and S. Huggins will purchase the brickyard of Fetterling & Clapper, at Hartford City, Ind. The latter gentlemen contemplate going South in search of a good location for a brickyard.

Jas. W. Brooks has sold his interest in the Lebanon (Ind.) Brick Works to B. F. Herdrich. Mr. Brooks has gone to La Follette, Tenn., to superintend the large brick plant at that place.

The press brick plant at North Baltimore, O., which has been idle for two years, has passed into the hands of Brooker Bros., who are fast putting things in shape to start up the works.

Lewis Young and George Flickinger, of Weatherly, Pa., have recently started a brickyard near that place. They report

their first burn a success, turning out 120,000 brick of fine quality.

The Queen's Run Fire Brick Works, Lock Haven, Pa., have found it necessary to increase their force, and are now running their plant night and day in order to meet the demand for their product.

T. W. Carmichael, the clay steamer man, of Wellsburg, W. Va., writes us that he has sold fourteen steamers this season, the last order being to Christiana, Norway, in response to a cablegram.

The Eldora (Ia.) Clay Manufacturing Company's plant, which has been idle more than a year, recently started up, and have orders enough to keep them running full force for some time to come.

W. D. Richardson, Superintendent of the Ohio Mining and Manufacturing Company, Shawnee, O., recently booked a nice order for 200,000 buff brick, to be used in the buildings of the Newark Tube Works.

Quite a number of brickmaking plants in Illinois, Ohio and Pennsylvania have been compelled to close down on account of scarcity of coal. This condition of affairs has been brought about by the miners' strike.

The Mechanicsville (N. Y.) Brick Company have increased their capital stock, and will construct a new plant, to be operated in connection with the present plant. It will have a daily capacity of 40,000 brick.

The Algodones Tile and Brick Company has been incorporated by R. G. Balcomb, J. M. Moore and A. T. Finical, of Albuquerque, to manufacture brick and tile at Algodones, N. M. The capital stock is \$10,000.

The St. Joseph (Mo.) Pressed Brick Company is feeling pretty good over a contract for 2,000,000 brick, secured from Swift & Co., for the construction of buildings for the new stockyards. The brick are to be delivered at once.

Jones G. Johnson, for many years a brick manufacturer at Taunton, Mass., died in that city the 2d inst. During his long life he earned the esteem and respect of all with whom he came in contact, and leaves a large circle of friends.

Wigert & Co., Trenton, Mo., advise us that they would like to purchase a second-hand stiff mud brick machine and crusher that will work soapstone and shale, and accordingly desire to communicate with parties who can supply the want.

The stable of the Washington (D. C.) Brick Company was burned July 14. Fortunately, all the horses and mules were out of the stable at the time, but large quantities of corn, oats and hay, several sets of harness and two valuable dogs were burned.

Camden, N. J., is to have a new pottery. It will be known as the Lyons Pottery Company, and will be operated by J. H. Lyons, G. Walter Lyons and Samuel Jenks. The two former gentlemen are practical potters, and the success of the plant is assured.

Among the recent sales of the Woolley Foundry and Machine Works, Anderson, Ind., is a brick machine to Beecher Goodykoontz, at Atlanta, Ind. Mr. Woolley says Mr. Goodykoontz is making as fine a brick as it has ever been his privilege to see.

A peculiar accident occurred at the Gem City Paving Brick Company's yard, at Peoria, Ill., recently. Wm. Enghauser, an employe, was pushing a wheelbarrow full of brick across the yard, when he stumbled and fell over the barrow and broke his collar bone.

Thos. Hebdon, of Holly Springs, Miss., writes that he and his son, R. B. Hebdon, will start a steam brick plant at Friar's Point, Miss., next spring. Mr. Hebdon, Sr., has made brick for the last thirty years, he says, so there is no doubt as to the success of the new plant.

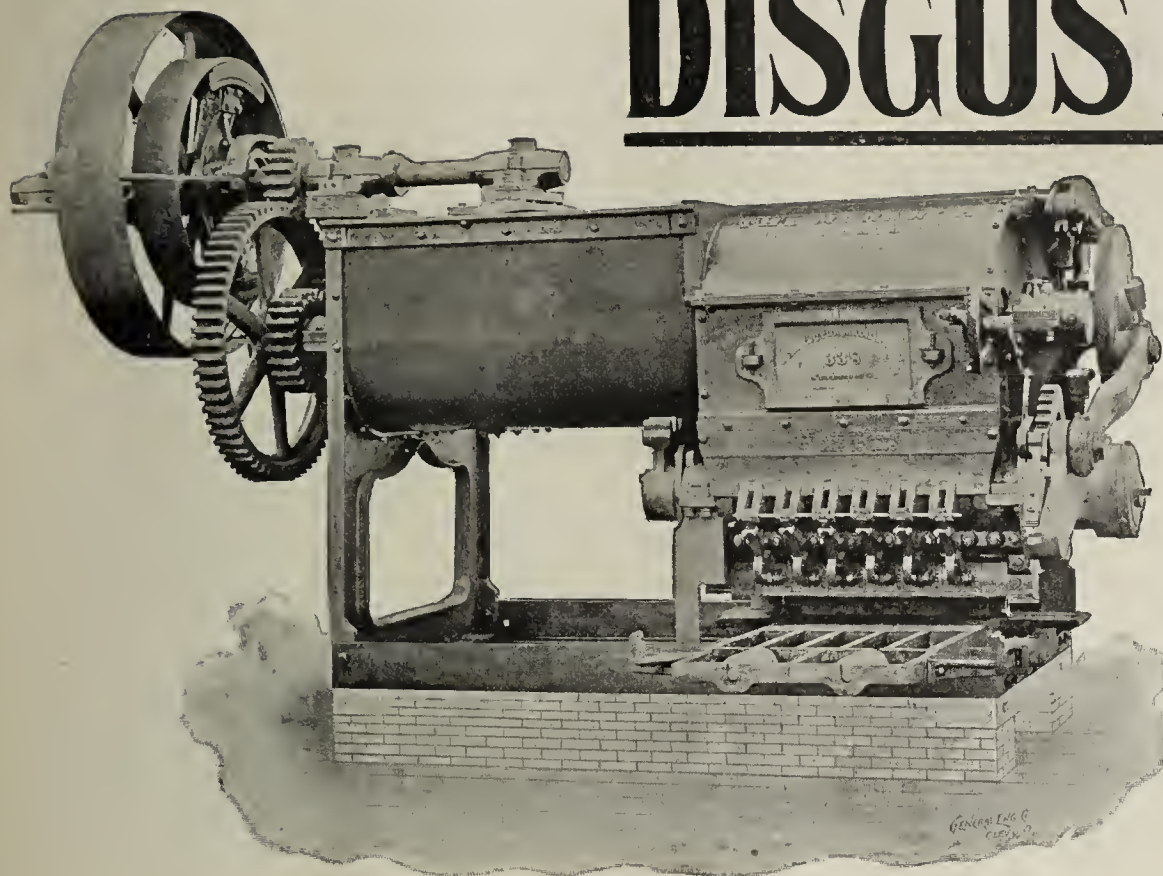
A. F. Smith & Co., fire brick manufacturers, of New Brighton, Pa., have found it necessary to enlarge their plant. They are putting up a new drier and have ordered thirty additional iron cars. They expect to increase their daily capacity about 15,000 brick by the improvement.

The Standard Dry Kiln Company, Indianapolis, Ind., are erecting a 40,000 a day capacity drier for the Best Brick Company, Mechanicsville, N. Y. It is a ten-track drier and is 116 feet long, equipped with steel-rack cars. They think the drier will prove a model for drying soft mud brick.

On the 1st of the present month that part of the plant of the Pioneer Fire-proof Construction Company, at Ottawa, Ill., known as Factory B was discovered to be in flames, and before anything could be done by the firemen to save it the entire plant was completely destroyed. The loss is estimated at about

[CONTINUED ON PAGE 140.]

DISGUSTED



And wanting to kick themselves, have been several parties lately who bought machines, sanders, moulds or other supplies without getting OUR prices when they learned what they were.

Don't You Do It.

We don't claim to be "the only pebbles on the beach," but as we are one of the FEW firms who have been **LEADERS** (in every sense) for nearly a generation,—

Common sense will surely prompt you to know what we can do

NOW.

Prices on some goods were never so low.

The "Monarch"

Horizontal; with Double Pug Mill and Double Presses, and other valuable features contained in no other.

The "Iron Quaker"

Upright; simplest, best and lowest priced of any real competitor.

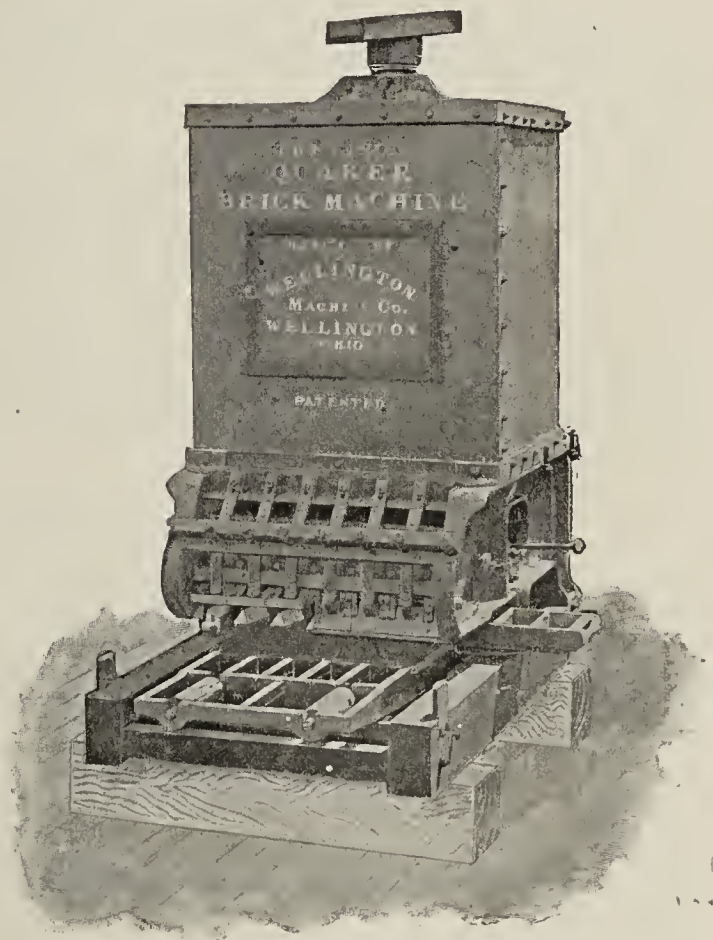
These two machines are unquestionably the leaders of their kind.

AUXILLIARY MACHINES AND SUPPLIES.

Pug-Mills, Disintegrators, Crushers, Mould-Sanders, Represses, Winding Drums, Dump Cars, etc., Moulds, Dump Tables, Dryer Cars, Kiln Doors and Castings, Elevators, Dump Carts, etc., etc.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE.

Odd sizes of moulds. Have not been used.

5 moulds, $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{8}$. 9-16 inch partitions.
20 moulds, $8\frac{13}{16} \times 4\frac{3}{16} \times 2\frac{7}{16}$. 9-16 in. partitions.
12 moulds $9\frac{5}{8} \times 4\frac{5}{8} \times 2\frac{1}{2}$. $\frac{1}{2}$ inch partitions.

Second-hand, but used a few days only.

10 moulds, $9\frac{1}{2} \times 4\frac{9}{16} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
19 moulds, $9\frac{1}{2} \times 4\frac{5}{8} \times 2\frac{9}{16}$. " "
16 moulds $9\frac{1}{4} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 inch partitions.
16 moulds $9 \times 4\frac{1}{2} \times 2\frac{1}{2}$. 9-16 inch partitions.

The Wellington Machine Co.,

WELLINGTON,
OHIO.

Send
for
Circular.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

\$50,000, on which there is about \$12,000 insurance. Colonel Moulton, President of the company, said in all probability they would rebuild, although it is not yet definitely decided.

We are in receipt of a letter from Wyatt Owen, 1204 Mt. Royal Ave., Baltimore, Md., who desires to be put in communication with parties who can give him any information in regard to making brick out of the refuse of a slate quarry. He wants to get a machine to work the material.

A mud drum on a battery of boilers in one of the brick plants of Park Bros., at Crows' Run, near Beaver Falls, Pa., blew off recently. Two boilers were thrown from their positions and the roof torn from the building. None of the workmen were hurt. The loss will amount to about \$2,500.

The Garfield (Pa.) Fire Clay Plant, which was completely destroyed by fire the latter part of July, will be rebuilt at once. Superintendent T. J. Robinson says the insurance on the burned plant will enable them to erect a new plant, and the orders on their books necessitates this being done as soon as possible.

E. Bryant, a colored employe of the Rome (Ga.) Brick Company, fell from a clay car and was crushed to death beneath the wheels. After the car had been loaded the men were ordered to get off, but Bryant wanted to ride and stayed on the car. In a very few minutes he lost his balance and fell to his death.

Henry Ginrich, a well-known potter, died at his residence in Lebanon, Pa., July 27. The local papers say of him: "As a husband and father he was a model, and, as a citizen, lived an upright, straightforward life. He lived soberly, uprightly, honestly, and tried to do his duty to God and his fellow-man."

A large section of a towering clay bank adjacent to the Connecticut River Brick Company, Chicopee, Mass., gave way recently, causing a landslide of no small proportions, and precipitating hundreds of tons of clay on the brickyard and adjoining property. The brickyard was piled eighty feet high in places.

The Monmouth (Ill.) Pottery Works, which were recently destroyed by fire, have been rebuilt on a much larger scale, increasing their capacity from 6,000,000 to 10,000,000 gallons. The latest modern improvements have been added, a feature of which is a press for making jars of from one to two hundred gallons.

The firm of Wm. Moellering & Sons, contractors, Fort Wayne, Ind., has been dissolved. Mr. Moellering, Sr., has retired from the contracting business and will hereafter devote his entire attention to his extensive brickyard business, while Chas. E. and Edward H., the sons, will carry on the former business.

W. J. Woolley, of the Woolley Foundry and Machine Works, Anderson, Ind., called at the Clay-Worker sanctum last week. He says he cannot complain of hard times, and that they are going to put up a new foundry this fall that will "be far ahead of anything in Anderson up to date." His newly acquired brick plant is running full force.

The death of Edmund Lang, a prominent Hudson river brick manufacturer, occurred at his home at New Windsor, N. Y., Aug. 1. Mr. Lang was seventy-four years old, and had been engaged in the brick business some twenty-five or thirty years. In partnership with his son, he, at the time of his death, was running the Walsh brickyard at New Windsor.

Andrew Barr, the senior member of A. Barr & Son, brick manufacturers at Urbana, Ill., died at his home in that city July 24. Mr. Barr was born in Scotland in 1835, and came to America in 1857, locating in Wisconsin. From there he went to Urbana, which place he had made his home for thirty-seven years. In his death Urbana loses one of her best citizens.

James & Sisson are starting a dry press brick plant at Bowling Green, Tex. The plant will be equipped with Chisholm, Boyd & White machinery and Chandler & Taylor engine and boiler, and will have a daily capacity of 15,000 high grade brick. They write that they have seven acres of fine shale, which has been tested, and makes a brick of a "beautiful red color, as hard as flint and smooth as glass."

The immense plant of the Washington Brick, Lime and Manufacturing Company, at Clayton, Wash., was entirely destroyed by fire July 21. The plant will be rebuilt at once. A short time since the office and warehouse of the company at Spokane, Wash., were partly destroyed by fire, a little fire damaged some brick and kiln shed, and finally came the destruction of the entire main plant, which entails a loss of about \$25,000.

L. D. Patton, engineer of the Phoenix Brick Company's plant, at St. Joseph, Mo., was caught in the fly wheel of the engine and instantly killed July 30. There was no witness to the terrible accident, but the supposition is that Mr. Patton was oiling the machinery, when he was caught in the wheel. He

was thirty-three years old and unmarried, and had been employed at the Phoenix works since last May. He was a young man of exemplary character.

F. D. Clute, Manager of the Glen Mary (Tenn.) Coal and Coke Company, writes that they have erected an experimental plant at Glen Mary for the manufacture of vitrified paving and sidewalk brick, and that their experiments and tests have proven successful in every particular. The clay, which has been tested and pronounced A1 for pavers, underlies their coal, ranging from three to seven feet thick, and makes a medium plastic and non-absorbent brick. It is altogether probable, he says, that the company will go into the business on an extensive scale, and will be known as the Glen Mary Vitrified Brick Company, but for the present all mail should be addressed to the old firm name.

PACIFIC COAST NEWS.

THE LOCAL terra cotta and clayworkers complain of a continued inactivity in their line of trade. Very little in the way of building is going on at present, and this will remain the case probably for some time to come. In other lines of trade business appears to be picking up, the cause of which, to a great extent, is the gold excitement in the Klondike region, together with the tremendous wheat output of the Pacific States, which is selling at \$1.35 a bushel, as against 80 and 90 cents last year. On the whole, our outlook was never better.

Work has now begun on the large clay pipe factory in the Colonia de Santa Julia, Mexico. Ten acres of land will be occupied by the proposed building and the two companion buildings to be erected later. The main building of the new factory will be 215x85 feet and the annex 40x50. There will be five kilns, each thirty feet in diameter. The capacity of the plant will be about five carloads of pipe per day. In addition to this, it is expected to add two more plants for the purpose of manufacturing fire brick, vitrified clay bricks for paving, and all kinds of articles from clay. The clay itself will be taken from a deposit in the Republic, which has been tested several times and found to be satisfactory. The work is for the Mexican Clay Manufacturing Company, under a concession granted to C. C. Merrill, of Los Angeles, Cal., last December. The company is capitalized in the sum of \$500,000, gold.

George Hamilton and Leonard Clark have formed a combination at Northport, Wash., for the manufacture of brick, and men are at work clearing off the ground and setting up the machinery. They have secured the clay banks on the Bishop farm, and, after having tested it, find it the best kind of brick clay.

The old brickyard near Glen Creek, New Westminster, B. C., presents a busy scene. The works will be in operation for some months to come, at least, as an order has just been placed for 1,000,000 bricks, to be used in the new \$20,000 addition to the Hospital for the Insane at New Westminster.

Forty thousand brick which Contractor Baske had ready for burning, at Davenport, Wash., were destroyed by the rain. The walls of the building for which the bricks were intended are to be veneered with a white compressed brick.

J. Dyer and Mr. Craycroft have opened the old brickyard south of Madera, Cal., and have commenced making brick.

John Green is preparing to burn a kiln of brick at Manti, Utah.

L. Ruch is making brick at Colville, Wash.

Fires have been started in the brick kilns of E. Kay and others at Jackson, Cal. Mr. Kay's kiln contains 300,000 brick. It is the intention to make another kiln in the same ground that will contain the same quantity.

The samples of the clay found near Jerome Junction, Ariz., are to be tested for brickmaking purposes, and if the clay proves to be the proper kind brickmaking will be commenced at once at that place.

The brickmaking plant at Versteeg's yard, near Guild's Lake, Ore., has been destroyed by fire. The loss is estimated at \$5,000, partially covered by insurance. The origin of the fire was clearly incendiary. The plant belonged to the Nicholas Versteeg estate, and had been leased by M. Versteeg, who intended to put it in operation in a few days.

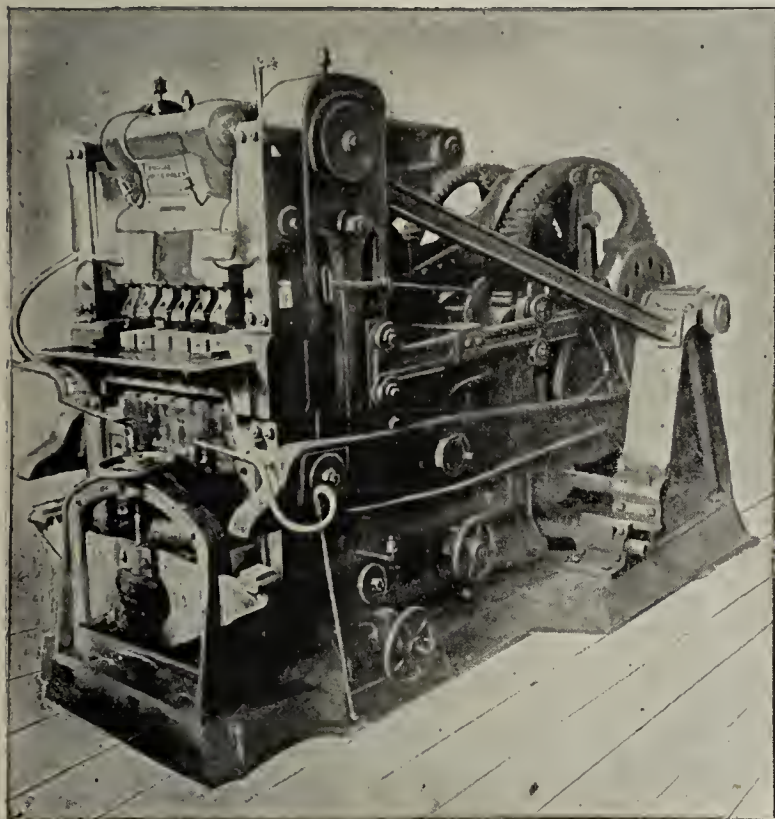
Beds of fire clay of a high grade are found at Salem, Ore. The red hills south of that city also produce a good quality of potter's clay.

Large beds of clay are found in the Newport and Priest lake districts in Oregon. These deposits are within two hundred feet of the Great Northern track for a distance of three miles.

James Jones and A. J. Jones, brick manufacturers, will soon commence operations in Juneau, Alaska.

The Pacific Clay Works have begun operations at Corona, Cal.

The PROGRESS BRICK PRESS.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE
ON APPLICATION.

Progress Press Brick and Machine Co.,
King's Highway and Oak Hill R. R. **ST. LOUIS, MO.**



Read What

H. C. Carroll & Sons. of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE, 60TH AND HAVERFORD STS.

TELEPHONE 147, W. P.

H. C. CARROLL & SONS,
Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS: { 57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell your troubles to"

The F. D. CUMMER & SON CO., Cleveland, Ohio.

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cent a word, each insertion; about seven words make a line. **Cash** should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

WANTED—Good second-hand stiff mud brick machine. Address, with all particulars, P. O. BOX 1310, New Orleans, La. 81d

FOR SALE, CHEAP—One Potts horizontal stock brick machine, complete, with new molds. All in good condition. 81d "P." care Clay-Worker.

FOR SALE AT A BARGAIN—One 4-mold Boyd dry press brick machine in perfect condition. **THE FERNHOLTZ BRICK PRESS CO.**, 8 tf 1 St. Louis, Mo.

WANTED—A second-hand crusher and pug mill, about 20,000 capacity, stiff mud brick. Give time used and make. Must be in good condition, and "cheap." Address **LOUISIANA**, Care Clay-Worker. 81ip

FOR SALE—Seven thousand dollars will buy controlling interest in a \$60,000 vitrified brick plant, equipped for winter running. Good demand for pavers at \$15 per thousand. Write for particulars. Address **C. C.**, care Clay-Worker.

FOR SALE OR RENT—A stoneware plant at Sioux City, Ia. Clay convenient and of excellent quality. Good prices. Market practically unlimited. Terms liberal. Address **SIoux CITY BRICK AND TILE WORKS**, 63 p Sioux City, Ia.

FOR SALE—In carload lots or outright, best grade porcelain clay-kaolin; assays 99 per cent. pure; free from sand, very plastic and burns white; one mile from railroad; three from deep water; near Washington, D. C. For samples and particulars address **W. I. SMITH**, Hyattsville, Md. 81 cm

FOR SALE—Brickyard, completely equipped; capacity, 25,000 soft mud brick per day. Is now in operation, making the best brick made in Columbus, O. Yard on paved street and near railroad switch. Have four down-draft kilns, of 75,000 capacity each, and one outside kiln of 400,000 capacity. Great bargain to good man. **J. A. McAULEY**, Columbus, O. 8 tf 5pm

FOR SALE—Brickyard at St. Johnsville, N. Y., complete, with down-draft kiln, pug mill, auger machine, boiler and engine, racks, barrows, tables, sheds, all ready for business, and an abundance of clay, on easy terms. For the right man this is as good as a gold mine. For particulars inquire of **ROTH & ENGELHARDT**, St. Johnsville, N. Y. 83 dc

FOR SALE—The half or the whole interest in first-class dry press brick plant in the South, located on a trunk line of railroad. Daily capacity, 40,000 brick. Red, mottled and fire brick. There is also splendid shale, which has been tested in the manufacture of street pavers, close by, and which has been proved equal to any material for that purpose. For particulars address **DRY PRESS**, Care Clay-Worker. 812p

FOR SALE OR RENT.

Large brickyard at Spring City, Pa.; two brick kilns, 300,000 capacity; Monarch brick machine, capacity 25,000 per day; complete plant; best quality clay for common and pressed bricks; railroad siding, coal sheds and office. Address **W. S. FURST**, 83 md 738 Drexel Bldg., Philadelphia, Pa.

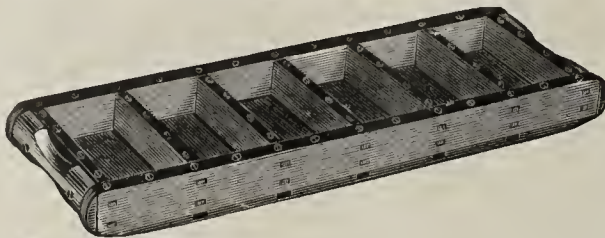
FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, 1/2 screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
1 Barr Pumping Company steam pump.
1 Chambers Bros. Company brick machine.
All new or little used, and in excellent condition. **WALNUT**, Care Clay-Worker. 5 tf d

HARDIN & CHURCH

MANUFACTURERS OF

BRICK MOULDS



Don't fail to get our prices.

Of every kind and description. We make a specialty of Brick moulds and have the largest and best equipped factory for this work in the U. S. Our motto is "The Best Mould for the Least Money."

Special sizes made to order quickly.

FREEMPORT, IND.

THE

HOT BLAST APPARATUS

FOR DRYING BRICK TILE AND TERRA COTTA

American Blower Co
SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

SEND FOR CATALOGUE

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in United States, Canada and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
Marletta, Pa.

Chenoa, Ill.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

F. H. C. MEY,
Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



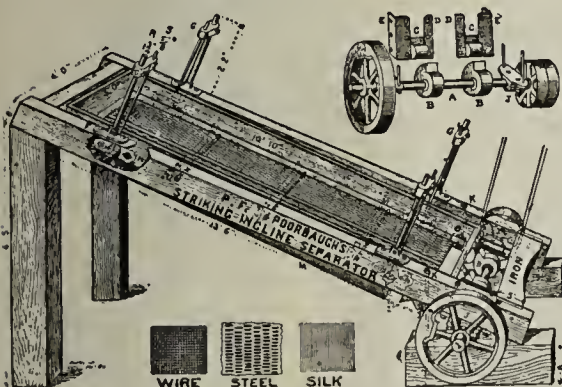
MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

STRIKING INCLINE SCREEN



For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.

These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the

THE PITTSBURG MINERAL SCREEN CO.

PITTSBURG, PA.

Write for Prices.

FOR SALE—75,000 second-hand 34-inch pallets; price, 3 cents each on cars, Buffalo. J. F. STENGEL,
7 2 2p 928 Ellicott Square, Buffalo, N. Y.

FOR SALE—One complete overgeared 8-foot dry pans, with 48-inch pulley, entirely new. For particulars inquire of SMITH & CAFFREY,
7 4 dm Syracuse, N. Y.

NO DRY PRESS Brick Plant complete without the Carmichael Clay Steamer. T. W. CARMICHAEL,
Inventor and Manufacturer,
6 t f d Welisburg, W. Va.

WANTED—Fine line of pressed brick to sell on commission in Chicago, along with present line of terra cotta and roofing tile. Have 8 years' acquaintance with architects and contractors. References exchanged. Address ARTHUR POLLAK,
7 1 d 1122 Marquette Bldg., Chicago.

WANTED—Situation as superintendent of a paving or building brick plant. Know how to operate and manage both, and am familiar with all kinds of machinery, driers and kilns. Have had years of experience, and am thoroughly reliable. No bad habits. Address BOX 88,
6 t f d Care Clay-Worker.

FOR SALE—One second-hand plain slide-valve Steam Engine, 12x24-inch cylinder, with pulley fly-wheel 8 feet in diameter by 17-inch face. Engine complete with governor and stop valve, and by maker of good reputation. We will put in order and place f. o. b. cars Philadelphia for \$300. Address CHAMBERS BROS. CO.,
6 2 L Philadelphia, Pa.

FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade, including both dry press and auger machines, also continuous kilns using coal and producer gas, and different patterns of down-draft kilns. First-class references. Address

7 1 d SUPERINTENDENT.
Care Clay-Worker.

FOR SALE, CHEAP.

The St. Joe Brickyard, situated on the Northeastern-Queen & Crescent Railroads, thirty-five miles north of New Orleans. Completely equipped in every respect. Capacity, six million brick per year. Is now in operation. Can be bought for less than one-third original cost. The machinery all in first-class condition. A good money-making plant. Offering for sale because too far to give personal supervision. Address WM. GARIG,
7 4 10pm Baton Rouge, La.

WANTED TO PURCHASE.

1 second-hand one or two-mold semi-dry brick machine of approved make. State maker's name.

1 second-hand revolving screen.

1 clay steamer.

1 hand repress, Cornell make.

Must all be in first-class order and cheap for cash. Address

MARTINE FIRE BRICK AND TILE CO.,
7 1 d Middlesborough, Ky.

FOR SALE.

40 acres of land, with a tile factory, sawmill, fence machine, four dwellings, with well, gardens, smokehouses and other outdoor buildings. This factory is a large one, four stories high, with two kilns, located nine miles from nearest railroad point, twelve miles east of Fowler, the county-seat of Benton county. This location cannot be beat for making and selling tile in the State; good tile dirt, and plenty of it. Sawmill, saws and fence machine all doing good business. Also, blacksmith shop and tools. A splendid location for store and postoffice, also for feed mill. This location for the above-named industries can't be beaten anywhere. Will sell at a bargain to the man who has the money.

For further information address L. B. JOSSERAND,
7 3 d Pleasant Ridge, Ind.

FOR SALE—Boiler, engine and brick machinery, located in Iowa. For sale very cheap. Address A. J. B., 73 c Care of Clay-Worker.

REAL BARGAINS IN NEW AND SECOND-HAND MACHINERY.

FOR SALE—A good soft mud brick machine, just as good as new, at the price of an old one; capacity 30,000 to 40,000 a day. Has worked successfully where others failed.

FOR SALE—A second-hand 60-horse-power slide valve engine, rebuilt, and a much better engine than many of the light ones now on the market; good for years of heavy work.

FOR SALE—A small but good tile machine, will make 3 to 8-inch tile or common brick, with 10-horse-power; just the thing for a small factory, and cheap.

FOR SALE—A good, though cheap, second-hand 40-horse-power piston valve engine, in excellent condition; suitable for small tile or brick plant.

MADDEN & CO.,
Rushville, Ind.
4 T 3t

Manganese.

From Producer to Consumer.

For Brick, Tile, Terra Cotta
and Pottery Makers.

PULP, POWDERED OR GRAIN.

Samples and Prices on Request.

KENDALL & FLICK,
MINES AND WORKS IN VIRGINIA.

OFFICE:

618 Penna. Avenue N. W.,

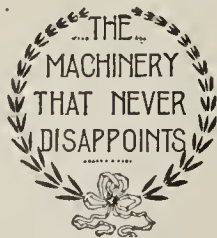
WASHINGTON, D. C.

Booklet on the use of this material free.

5,000

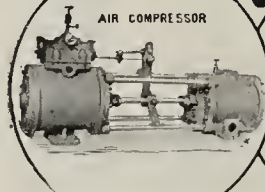
Brickmakers Wanted.

We want the 5,000 Brickmakers of the United States to know that we manufacture

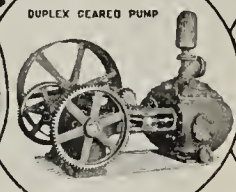


Write for particulars regarding any machine in the clay-working line. The American Clay-Working Machinery Co., Bucyrus, Ohio, U. S. A.

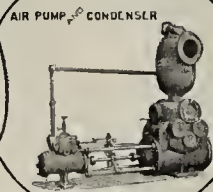
DEAN BROS' STEAM PUMP WORKS.



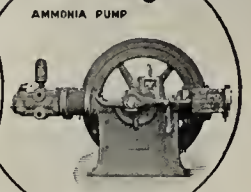
AIR COMPRESSOR



DUPLEX CASED PUMP



AIR PUMP & CONDENSER



AMMONIA PUMP

PUMPING MACHINERY
FOR ALL PURPOSES

INDIANAPOLIS, IND.

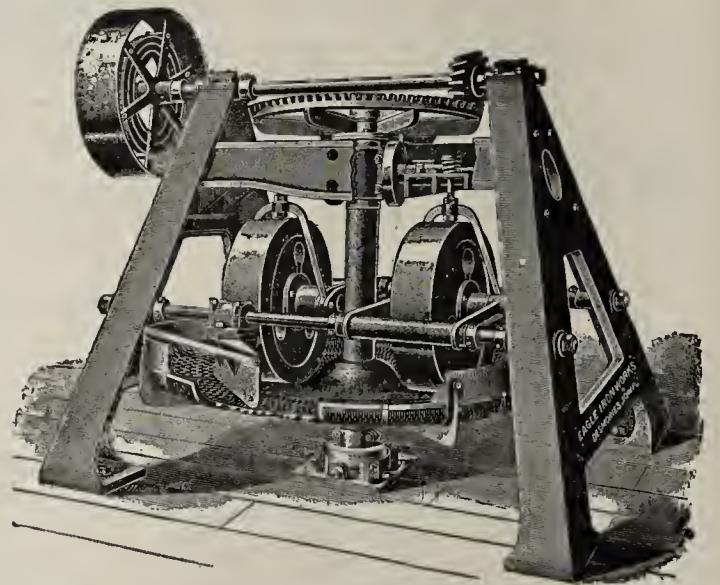
SEND FOR CATALOGUE
AND PRICES

OUR NEW 9 Ft. IRON FRAME DRY PAN

SEND for catalogue and read up on our patented features of this machine. Our motto in its construction and design is

"NOT HOW CHEAP.
BUT HOW GOOD."

EAGLE IRON WORKS, Des Moines, Ia.



BRICK MACHINES AND REPRESSES.

....

THIS cut represents our Stiff Mud Brick Machine. It will work any kind of brick material including fire clay, shale or common clay right from bank without the use of a pug mill. Each brick is pressed separately and can be haked 7 or 8 high, or repressed right from machine.

Over 500 in operation.

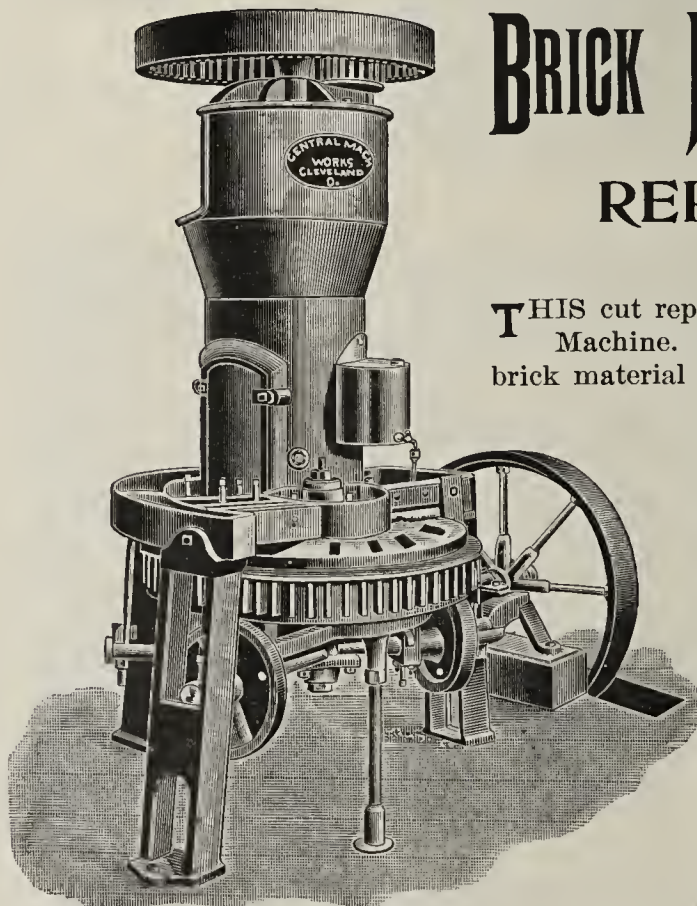
Send for price and circulars

Manufactured by

CENTRAL
MACHINE
WORKS,

226-236 Abbey St.

Cleveland, Ohio.



NOTICE—We furnish all supplies and repairs for any make of the "Sword" Brick Machine.

Mention the CLAY-WORKER,

When writing to Advertisers

Mention the CLAY-WORKER.

Conveying, Elevating and...
Power-Transmitting Machinery.

H. W. CALDWELL & SON CO.

Specialties for Handling Material of all Kinds. **CHICAGO.**

CALDWELL Steel Conveyor.

Manufactured exclusively by us at Chicago, with latest Improvements.

GENERAL MACHINISTS,
 127, 129, 131, 133 West Washington St.

Send for Catalogue.

LINK BELTING.
 SPROCKET WHEELS
 COTTON BELTING.
 RUBBER BELTING.
 LEATHER BELTING.
 BELT CLAMPS.
 ELEVATOR BOLTS.
 ELEVATOR BUCKETS.
 CONCRETE MIXERS.
 FRICTION CLUTCHES.
 JAW CLUTCHES.
 COUPLINGS.
 FLEXIBLE SPOUTS.

GEARING (all kinds.)
 ELEVATOR BOOTS.
 HANGERS.
 PERFORATED METALS.
 PULLEY BLOCKS.
 IRON PULLEYS.
 WOOD PULLEYS.
 SHAFTING.
 SET COLLARS.
 SWIVEL SPOUTS.
 TAKE-UP BOXES.
 TURN HEAD SPOUTS.
 WIRE CLOTH.

CALDWELL-AVERY SEAM-LESS STEEL ELEVATOR BUCKETS.

CLAY-MILLER

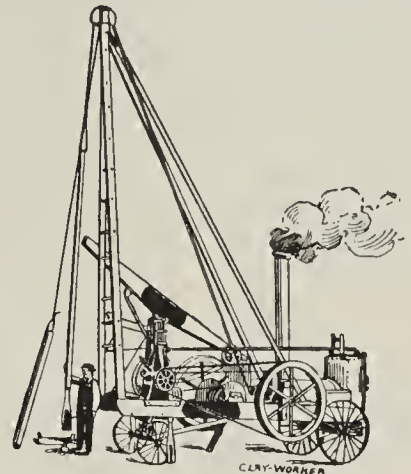
FAST TIME AND THROUGH SERVICE TO SOUTH BEND.

Commencing June 22, through parlor cars will be operated between Indianapolis and South Bend daily, except Sunday, on Big Four train No. 3, leaving Indianapolis at 5 p. m., making immediate connection with Vandalia line fast train at Colfax, which passes through Frankfort, Logansport, Lake Maxinkuckee and Plymouth, arriving at South Bend at 10:45 p. m. G. E. ROCKWELL, D. P. A., for details.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street, PERTH AMBOY, N. J.

Steubenville Foundry & Machine Works,

Established in 1820.

—Manufacturers of—

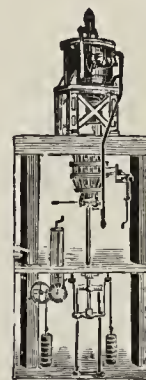
STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,

Making From 2 to 30-Inch Pipe Inclusive.

Pipe, Brick, Tile, Copping, Fire Proofing, and Building Block Dies.

Clay Grinding and Tempering Pans and Pug Mills.



FEED SCREWS

FOR MINING CLAY.



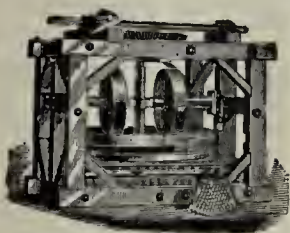
STEAM ——— ENGINES



Every Variety of Iron and Brass Castings Shafting and Pulleys.

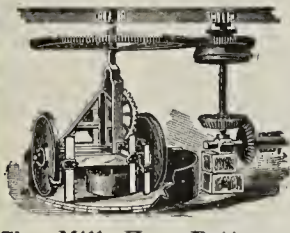
Send for Circulars and Estimates.

JAS. MEANS & CO., Steubenville, Ohio.



Dry Pan.

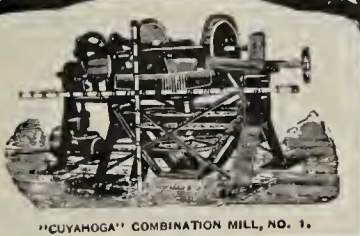
THE TURNER,



Clay Mill—Harp Pattern.

VAUGHN & TAYLOR CO.
 MANUFACTURES & EXPORTERS OF **CLAY WORKING MACHINERY.**
 CUYAHOGA FALLS, OHIO, U.S.A.

WIRE DRAWING MACHINERY.
 CHAIN MAKING MACHINERY.



"CUYAHOGA" COMBINATION MILL, NO. 1.

SHODDY AND RUBBER WASHING MACHINERY.

POWER TRANSMITTING MACHINERY.

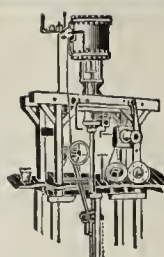
PULLEYS & GEARING.
CRANES

HEAVY CASTINGS
 GRAIN CLEANING MACHINERY.
 ROPE TRANSMISSION
 HOLLOW TUBING MACHINERY.
 AND

CONTRACTORS FOR COMPLETE PLANTS.

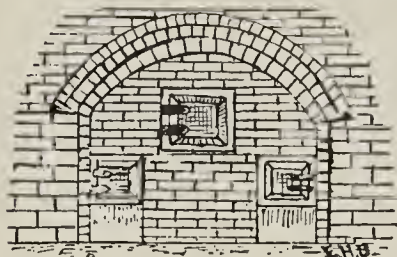


Flower Pot Machine.



Vaughn Press—Sewer Pipe.

Swift's Kiln Furnace.



F. E. SWIFT'S PATENT SLACK COAL COKER,
GAS GENERATOR AND SMOKE CONSUMER.

CAN BE ATTACHED to any kind or style of Up or Down-Draft kiln. Nothing but slack or waste coal used from start to finish of burn.



gate—I can save you good money.
For further particulars, address

F. E. SWIFT,
Washington, Iowa.

The Keystone Brick Yard Supply Co.,

**Office and Works: 240 Arch Street,
LANCASTER, PENN.,**

MANUFACTURERS OF

Machine Brick Moulds

a Specialty.

With the latest improved machinery, and the best of skilled help and the very best material we are enabled to furnish moulds better and cheaper than any other make. Please let us know what you may want and receive some interesting prices.

Common Brick Moulds 5 or 6 Brick.....	\$1.75
Iron Lined heads " " " " "	2.10

Write for special discount on
all orders after July 1.

LUMBER AND BRICK DRYERS,
MOST EXTENSIVE IN USE.
W. A. LEARY,

1103 H Street, N. W.

WASHINGTON, D. C.

Do You Want

CREDIT REPORTS on men who make BRICK, on men who buy BRICK, on men who sell BRICK? Trustworthy service at lowest prices; ordinarily \$1.00 for each report.

RELIABLE LIST of BRICK manufacturers and Supply men, in any State, in any Country? These can be furnished at small cost, usually \$1.00 for any single list.

ADVANCE REPORTS that are advance reports of all contemplated construction work calling for BRICK?

TO KNOW how to sell BRICK to the Government?

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS,

ESTABLISHED NINE YEARS.

Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.



'LEVIATHAN.'

“Upon Earth There is not His Like.”

.....Sept..... 1896.
MAIN BELTING CO., 55 and 57 Market St., Chicago, Ill.

Gentlemen:—Please ship us via freight, 146' x 18' 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige.

Yours very truly,

Yours very truly,

Manufactured under Special Process.

A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

Main Belting Company,

Sole Manufacturers LEVIATHAN BELTING.

55 and 57 Market St., CHICAGO, ILL.

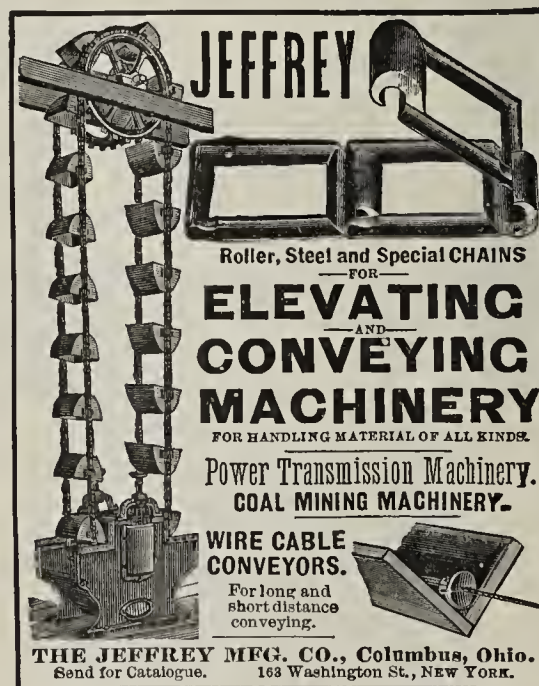
PHILADELPHIA:
1219 Carpenter Street.

BOSTON:
120 Pearl Street.

Elevators

**For handling
CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.**

Also Furnish
RUBBER,
LEATHER,
COTTON
BELTING.



Conveyors.

**Manufacture
SHAFTING,
PULLEYS,
HANGERS,
GEARS,
CLUTCHES,
BUCKETS,
BOOTS,
BOLTS,
Etc. . . .**

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

••••

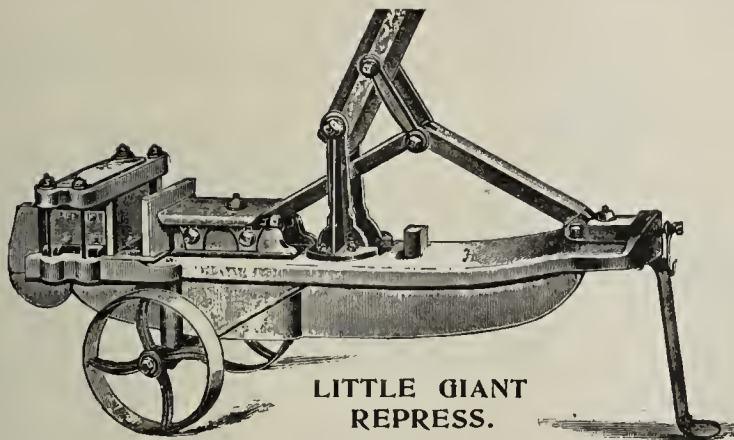
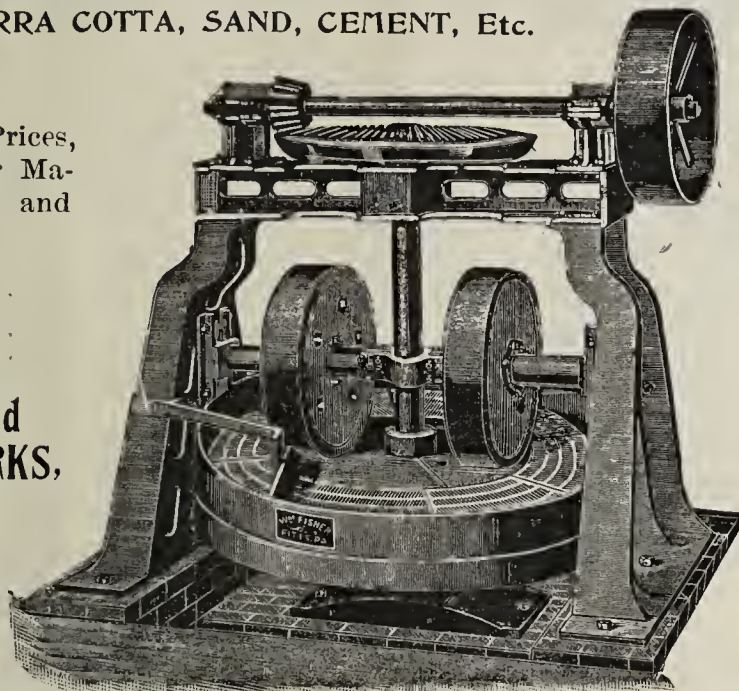
When writing for Prices, state kind of Clay or Material to be ground and capacity required.

••••

**FISHER ENGINE
FOUNDRY and
MACHINE WORKS,**

Phillips & McLaren,
Proprietors,

24th and Smallman Sts.,
PITTSBURG, PA.



LITTLE GIANT
REPRESS.

ELI Auger Machine,
Capacity 45,000 to
70,000.

ELI Jr. Auger Machine, Capacity 30,000 to 40,000.

LITTLE ELI Auger Machine, Capacity 15,000 to 20,000.

No. 1 A, Auger Machine, Capacity 25,000 to 35,000.

No. 2 B, Auger Machine, Capacity 12,000 to 20,000.

THE No. 1 A and No. 2 B Machines furnished with Square Hopper in place of Upright Pug Mill if desired.

DISINTEGRATORS, HORIZONTAL CONVEYORS,

GRANULATORS—SINGLE AND DOUBLE SHAFT,

UP-RIGHT PUG-MILLS, WINDING DRUMS,

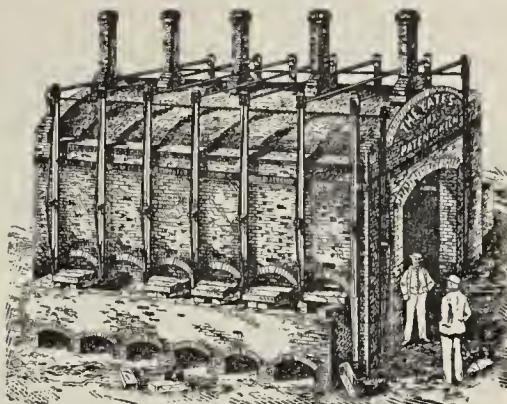
BRICK TILE AND HOLLOW BLOCK TABLES.

TRUCKS, WHEELBARROWS, ETC.

Manufactured and fully warranted by

Michigan Brick and Tile Machine Co.,
MORENCI, MICH.

Popkey-Mason Engraving Co.
SPECIALTY OF
CLAY WORKING
MACHINERY BY
WOOD, ZINC AND
HALF-TONE PROCESSES.
INDIANAPOLIS.
PHONE 326.



For Economy of Fuel
and Percentage of
Hard Burned
Brick

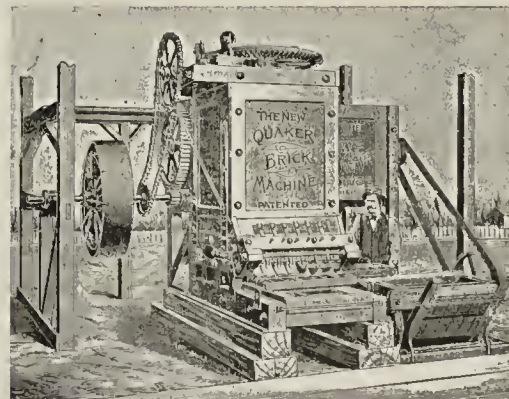
This kiln has no equal, I will be glad to tell you all about it.

ALFRED YATES,
Johnsonburg, Penn.

Soft Mud Brick Machinery

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sand-



ing Machine, capacity 40,000 or more per day. We carry in stock a full line of first-class brickyard supplies at a very reasonable price.

Send for Catalogue.

James W. Hensley,
General Agent,
Successor to S. K. FLETCHER.
INDIANAPOLIS, IND.

COLORIFIC.

For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of

WESTBROOK & WELLS,
Ogdensburg, N. Y.

ALBANY SLIP CLAY.

We have a large bank of a superior quality of SLIP CLAY. Price very low by barrel or carload. Best of reference as to quality. Address

JOHN H. JACKSON,
Successor to JACKSON BROS.,
ALBANY, N. Y.

N Y State Drain Tile and Pipe Works.
Established 1852.

A. F. TENNILLE'S

Bureau of

News and Legislative Information,

Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.

Lake Erie & Western R. R.

...ALL RAIL...

Niagara Falls EXCURSION.

Wait for the Old Reliable
Lake Erie & Western

PERSONALLY CONDUCTED

NIAGARA FALLS EXCURSION
Thursday, August 5, 1897,

...ALSO...

Sandusky, Put-In-Bay, Cleveland
and Buffalo, with side trips to

LEWISTON, TORONTO, THOUSAND IS-
LANDS, Etc.

For tickets, rate, time and pamphlet containing general information, call on any ticket agent of the above route, or address

C. F. DALY, Gen. Pass. Agt.,
Indianapolis, Ind.

FIRE	Dover Fire Brick Co.,	BRICK
	INCORPORATED 1870. MANUFACTURERS OF	
	Dover and Buckeye Fire Brick,	
	<i>Unexcelled for Kiln Purposes.</i>	
44 Mercantile Bank Bldg., Cleveland, Ohio.		

GEORGE A. MOSHER,
President.

JAMES A. BUCK,
Vice-Prest. and Gen. Man.

LE ROY VERMILYEA,
Secretary and Treasurer.

The Buck Machine Company,

SOLE MANUFACTURERS OF

Champion Brick Mold Sanding Machines, COHOES, N. Y.

The above Company was duly incorporated on the 8th day of March, 1897, under the laws of the State of New York, with a capital of \$60,000, which has been fully paid in.

This company has acquired by purchase all the interests of J. A. Buck and others in the business of manufacturing Champion Brick Mold Sanding Machines heretofore conducted by him, together with all patents covering said machines.

Of these patents, No. 301,087 is the foundation patent on the feed-rack applied to a cylinder machine. Buck's title to this patent was fully sustained by the decision of the United States Circuit Court of Appeals filed December 8, 1896, which decision was affirmed January 25, 1897, and a motion for a rehearing of the case denied. From this decision there is no appeal, and the title to this patent cannot be disturbed.

Patent No. 499,206 was sustained by Judge Coxe of the United States Circuit Court in a decision filed February 6, 1897, wherein he also sustained Buck's title to said patent. This patent covers the yielding form of feed rack as used in the later Champion Sanders. On February 15, 1897, a decree of the Court was entered granting and injunction against the use of infringing machines.

A copy of these decisions will be sent by mail upon request. Claims against users of infringing machines will be actively prosecuted. This Company is now prepared to promptly furnish the latest and most approved style of Champion brick mold sanding machines.

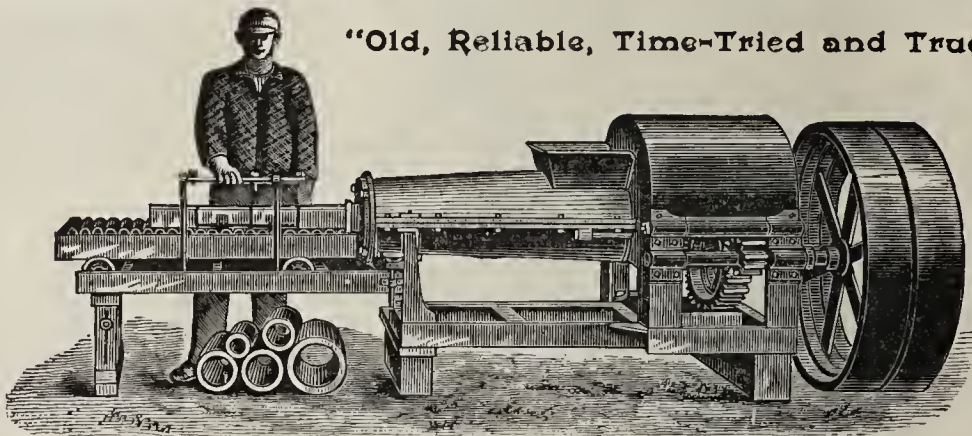
These machines are guaranteed in every respect, and purchasers will be fully protected in their use.

No agents should be recognized except those presenting credentials from this Company. All communications, orders and payments should be made direct to

THE BUCK MACHINE COMPANY, Cohoes, N. Y.

KELLS & SON'S IMPROVED BRICK AND ... TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON, PARKHILL, ONTARIO,

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the NEW QUAKER BRICK MACHINE.

G. COLDEWE & CO.,

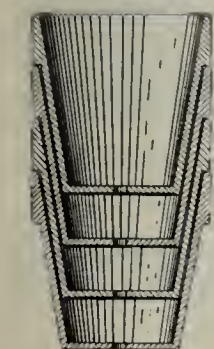
MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and... MACHINE MOULDS

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Make Money WITH THE ONLY SUCCESSFUL Flower Pot Machine (PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

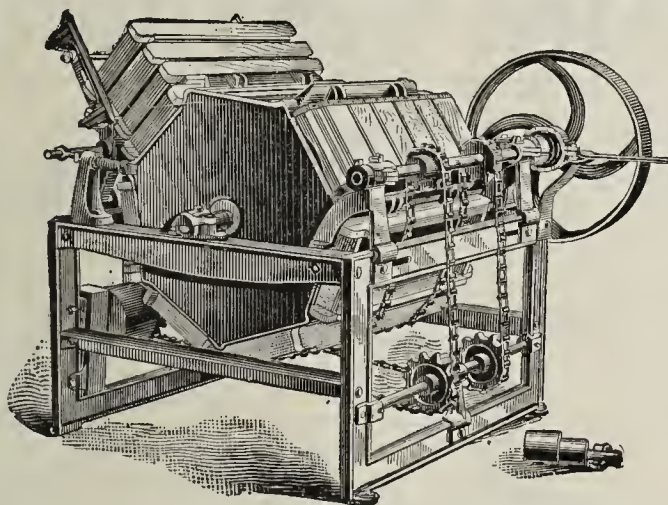
INDIANAPOLIS, IND.



CHAMPION Brick Mould SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and Serviceable.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.



THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, and a suit for that purpose has been commenced against Buck and is now pending in the United States Circuit Court for the Northern District of New York.

Only one patent No. 301,087 was involved in that decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit has been commenced on these patents against Buck, and any persons purchasing from him or his agents will be prosecuted for infringement.

4000 TO 5500
(Gallons of Water per hour.)
BY HAND-POWER.

Pumps, Hand-power Pumps.
(LOUD'S PATENT.)

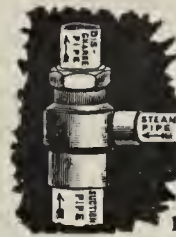
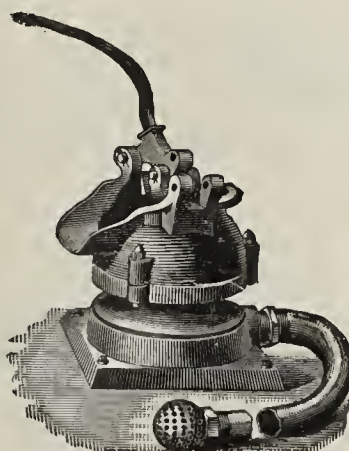
These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries or wherever it is desired to raise a large quantity of water by Hand-power. The pump has large valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



VANDUZEN STEAM PUMP
JET
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
Always in Order, never Clogs nor
freezes. Every Pump Guaranteed.
—10 SIZES.—
200 to 12000 Gallons per Hour.
Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, O.

GEO. S. COX'S
Ready Made
Cutting Wires,
Always give Satisfaction.
EAST LIVERPOOL, OHIO.
Send for Samples and Prices.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.
C. B. RYAN,
H. W. FULLER, Ass't Gen'l Pass. Agent.
Gen'l Pass. Agent, CINCINNATI, OHIO
WASHINGTON, D. C.

M. V. B. WAGONER'S
SLIP CLAY { For Glazing of Pottery } WORKS
ESTABLISHED 1845.
Clay in stock in any quantity, in barrels and bulk by the carload.
Office, 20 Ten Broeck St., ALBANY, N. Y.

STOP-LOOK LISTEN

THE POPULAR

MONON ROUTE
LOUISVILLE NEWALBANY CINCINNATI CHICAGO

IS THE BEST LINE TO

CHICAGO

TIME REDUCED TO 4 3/4 HOURS.
FOUR DAILY TRAINS

Leave Indianapolis	{ 7:00 a. m., 11:50 a. m. 3:35 p. m., 12:55 night
Arrive Chicago	{ 12:00 noon, 6:00 p. m. 8:20 p. m., 7:20 a. m.
Trains	{ 3:30 a. m., 7:45 a. m.
Arrive Indianapolis	{ 2:35 p. m., 4:37 p. m.

LATEST IMPROVED

VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant

PARLOR CARS AND DINERS

Local Sleeper in Indianapolis Ready at 8:30 p. m.
Leave Chicago, Returning, at 2:45 a. m.
Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: 2 West Washington St.,
Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.

VANDALIA LINE

The Short Line for

ST. LOUIS AND THE WEST.

LEAVE INDIANAPOLIS,	AT. TERRE HAUTE	AR. ST. LOUIS.
* 7:20 am	10:05 am	.....
* 8:10 am	10:15 am	3:15 pm
* 12:40 noon	2:35 pm	7:12 pm
* 7:00 pm	9:04 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am

*Daily.

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46 Jackson Place and Union Station.

W. W. RICHARDSON, Dis. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS

MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns **WANTING INDUSTRIES**

This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

TAKE THE
BIG 4
TO
ST. LOUIS

BRICK

BRICK CARS and TRUCKS

Of Any and All Kinds.

Easy Running. Light yet Strong.

Don't fail to get our prices. Catalogue free.

THE ATLAS BOLT & SCREW CO.,
Cleveland, Ohio.

CARS

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,

Wellsburg, W. Va.

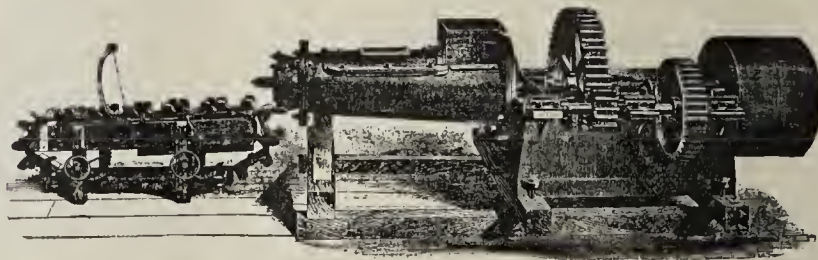
Fourteen (14) sold already this Season.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers
... of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

BRICK CARS

30 Different Styles,

Let us Save You Money.

The
Run
Easy
Kind.

Walworth Run Foundry Co.,
CLEVELAND, OHIO.

THE Best Up-to-Date Brick Dryer.

The PHILLIPS DRYER is THE BEST DRYER because it dries brick Quickly, Safely and Cheaply. By this system there is really no cost for fuel for it saves more fuel than it uses. This may sound queer but it's A PROVEN FACT.

Soft Mud Brick Dried in 10 or 12 hours.

306 Hannah St., West, Ont. Can. July 10th, 1897.

S. G. Phillips, Esq., Rahway, N. J.

Dear Sir:—I am pleased to reply that your little 12 feet x 51 feet, two track, drier has been in use by me since May 15th, 1897 and works remarkably well.

Our clay takes from six to eight days to dry on yard pallets and three or four days in a neighboring drier, yet the six or seven thousand large soft mud brick it holds on 16 cars are easily dried in 10 or 12 hours in a superior and most economical manner because of heating with the engine exhaust steam only.

The endless belts drive the 10x60-in. diameter (inside volume) fans easily not appearing to cost over 6 or 7 h. p. at 360 turns per minute to fairly make the wind blow.

You have the best drier in the market and I purpose in the near future to put in another two track section. Wishing you success, I am

Yours truly,
JOHN W. FRID.

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

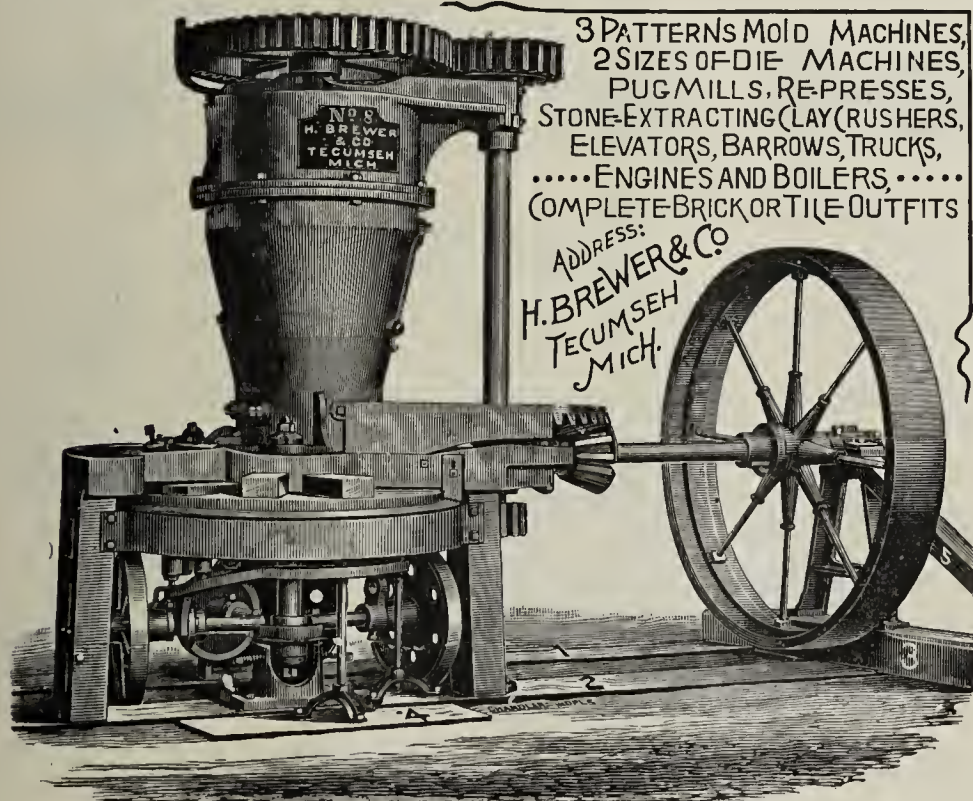
Yours respectfully,
CHAMBERS BROTHERS CO.,
J. H. Chambers, Gen'l Mgr.

S. G. PHILLIPS.

Agent and Patentee,

161 Grand Street.

Rahway, N. J.



3 PATTERNS MOLD MACHINES,
2 SIZES OF DIE MACHINES,
PUG MILLS, RE-PRESSES,
STONE-EXTRACTING (LAY) RUSHERS,
ELEVATORS, BARROWS, TRUCKS,
..... ENGINES AND BOILERS,
COMPLETE BRICK OR TILE OUTFITS

ADDRESS:
H. BREWER & CO.
TECUMSEH
MICH.

ARCHITECTURAL DRAWING

Designing; Architecture; Mechanical Drawing;
Machine Design; Stationary, Locomotive and
Marine Engineering; Electricity; Plumbing;
Railroad, Hydraulic & Bridge
Municipal, **31 COURSES** and
Engineering; Surveying and Mapping; Sheet
Metal Pattern Cutting; Bookkeeping; Shorthand;
English Branches; Mining; Metal Prospecting.
All who study **GUARANTEED SUCCESS.**

Fees Moderate, Advance or Installments.

Circular Free; State subject you wish to study.

International Correspondence Schools, Box 958, Scranton, Pa.



Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD, JACKSONVILLE and HANNIBAL, MO.

Through Sleeping Cars to St. Louis, Mo., via I. D. & W. Clover Leaf Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express.....	8.15 a m
Accommodation.....	3.45 p m
Fast Express.....	11.10 p m

ARRIVE.

Fast Express.....	3.35 a m
Accommodation.....	10.40 a m
Mail and Express.....	4.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



INDIANAPOLIS AND CINCINNATI LINE

6 Trains Daily. Parlor Cars and Cafe Dining Cars on day trains; Pullman, Compartment and Standard Sleeping Cars, and Chair Cars, also Wagner Sleeping and Chair Cars on night trains. Direct Connection made at Cincinnati without Omnibus Transfer, for all points

SOUTH and EAST

INDIANAPOLIS, TOLEDO AND DETROIT

The Michigan Line (via Hamilton.)

5 Trains daily to Dayton.

2 Trains daily to Toledo.

2 Trains daily to Detroit.

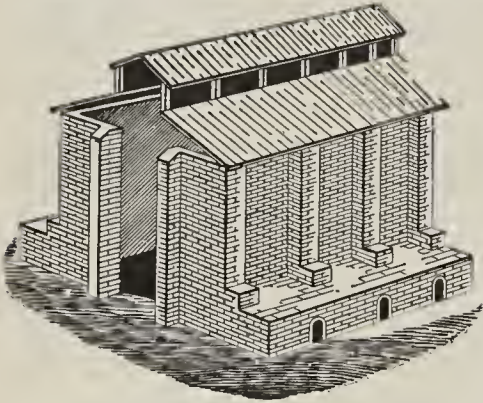
Observation, Vestibuled Coaches and Parlor Cars on Through Express Trains. Pullman and Wagner Sleeping Cars on night trains.

G. W. Hayler, D. P. A. } Indianapolis,
W. J. Nichols, T. P. A. } Ind.

D. G. EDWARDS,
Passenger Traffic Manager.



Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS,
Mention the CLAY-WORKER.



Up-Draft Kiln.

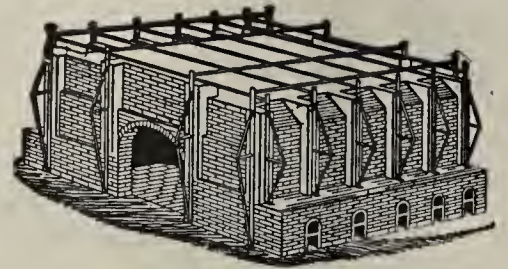
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiln.

ALSIP'S

LATEST IMPROVED DOWN and UP-DRAFT KILN.

I S SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

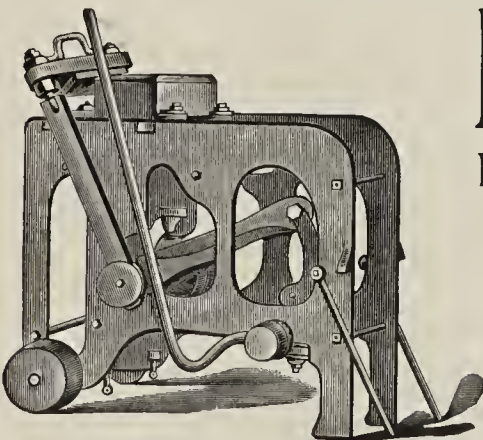
If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

Address, **S. H. ALSIP,**

Days Brick Yard.

BELLEVILLE, ILL.



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,

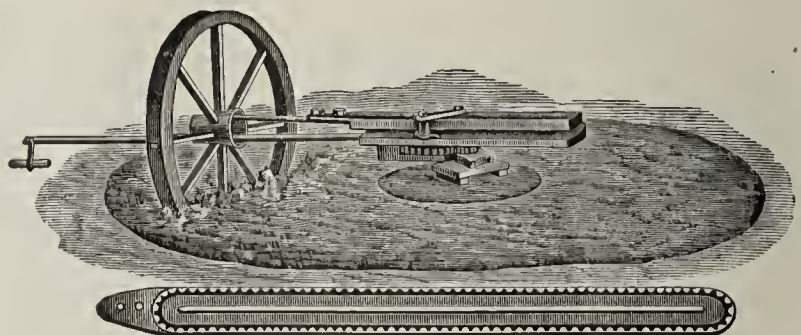
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

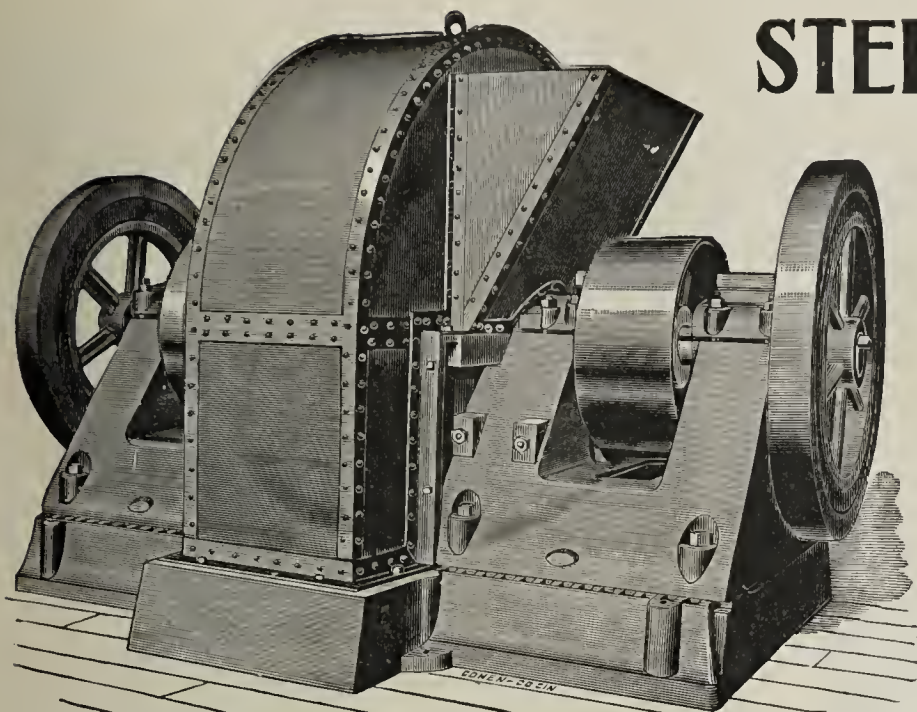
Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Send for Circular and Price-List.

STEDMAN'S IMPROVED CLAY DISINTEGRATOR



For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will not clog
in pulverizing damp clay, and the journal bear-
ings are constructed dust proof.

Write for catalogue, giving full description,
references and testimonials. Address,

Stedman's Foundry & Machine Works,
Aurora, Ind.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

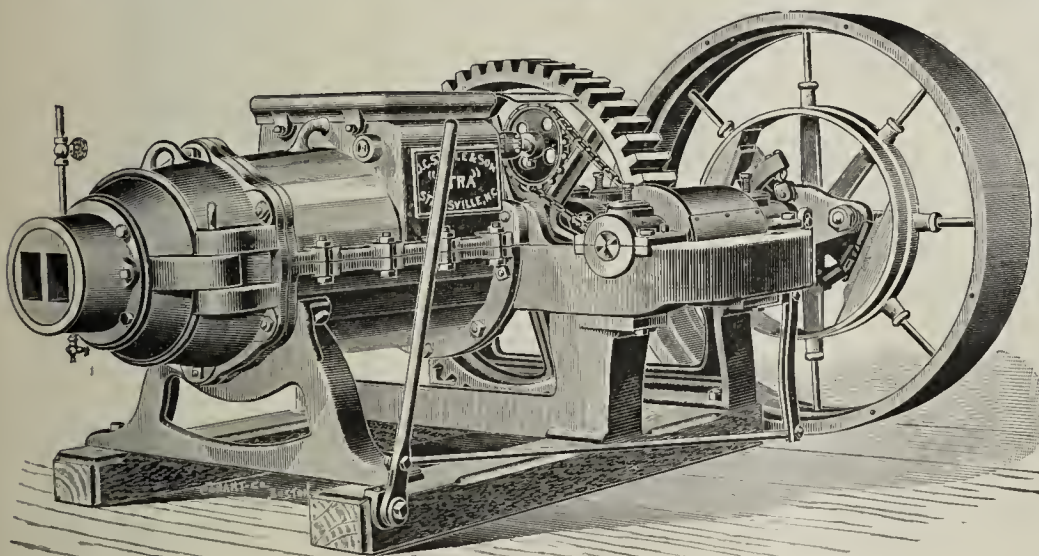
Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

The New South Brick Machinery



We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers,
Winding Drums, Clay Cars, Dryer
Cars, Brick Trucks, Elevators.

TACCIA, VA., June 30, 1896.

J. C. STEELE & Son, Statesville, N. C.

In answer to your enquiry will say we are using one of your latest Brick Machines shipped us about two months ago, and that it gives us pleasure to recommend it to any one wishing a good Brick Machine and one that will do all that is claimed for it.

We have had it thorough tested and it turns out work perfectly satisfactory. The contractor who is building the cotton factory here says its work is of an unusually high order.

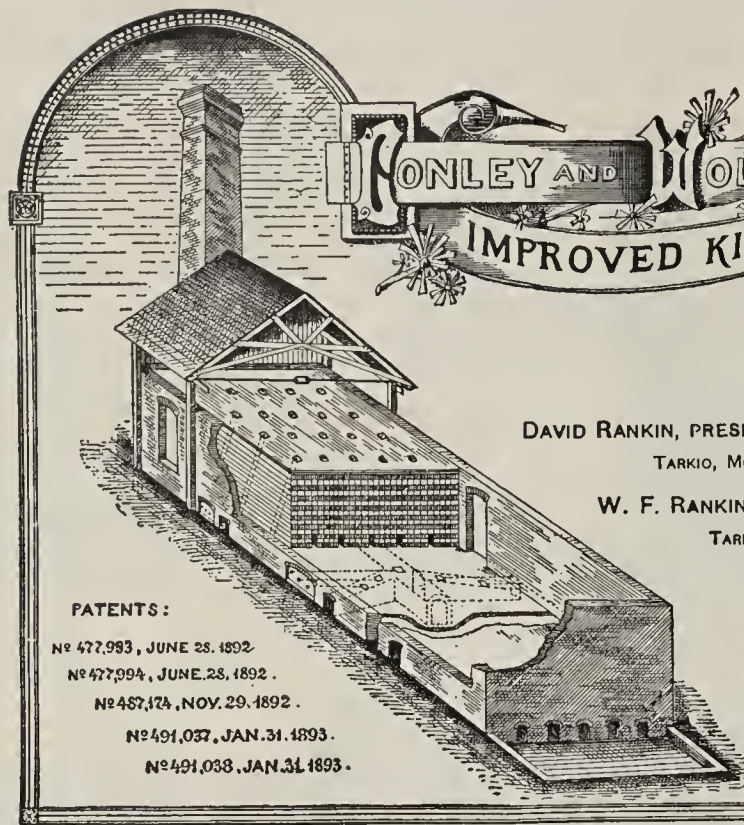
Yours respectfully,

T. A. CAPPS & CO.

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

X-tra Machine. Capacity 25,000.



CONLEY AND WOLFE
IMPROVED KILN COMPANY.

TARKIO, Mo.

OFFICERS:
 DAVID RANKIN, PRESIDENT, TARKIO, Mo.
 JOSEPH CONLEY, VICE-PRESIDENT, MOUND CITY, Mo.
 W. F. RANKIN, SEC'Y AND TREAS., TARKIO, Mo.
 J. M. WOLFE, GEN'L M'GR, TARKIO, Mo.

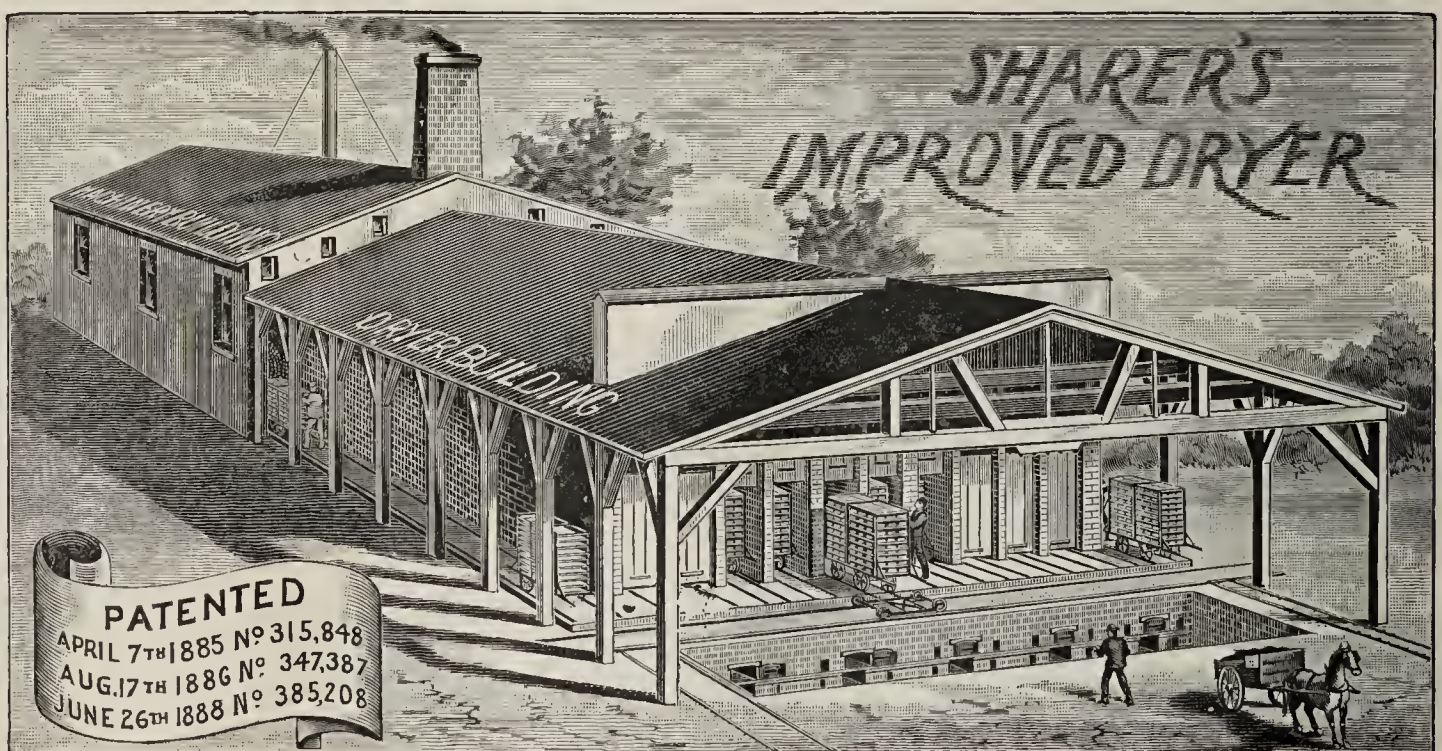
PATENTS:
 No 477,993, JUNE 28, 1892.
 No 477,994, JUNE 28, 1892.
 No 487,174, NOV. 29, 1892.
 No 491,037, JAN. 31, 1893.
 No 491,038, JAN. 31, 1893.

THIS KILN is cheap to construct, simple in operation and permanent in character. It has no crown to fall in and costs nothing for repairs. The dampers in the bottom give complete control of the heat and draft. It burns all brick evenly and thoroughly. It heats the brick gradually and cools the same, producing a tough and thoroughly annealed brick. It requires less than 200 lbs. slack coal per thousand to burn the very best annealed vitrified shale paving brick. It saves labor—one man can fire the largest kiln.

The Slack is converted into Gas and all the Heat Energy in the Coal is Utilized.

IT IS A SMOKE CONSUMER AND A PROFIT PRODUCER. ❖ **YOU NEED THIS KILN.** ❖ WRITE OUR GENERAL MANAGER FOR FULL INFORMATION.

Geo. W. Sharer, Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.



COMPLETE Dryer and Kiln outfits, and Complete Plants a specialty. Address

GEO. W. SHARER, 2224 Tioga, St. Philadelphia, Pa.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

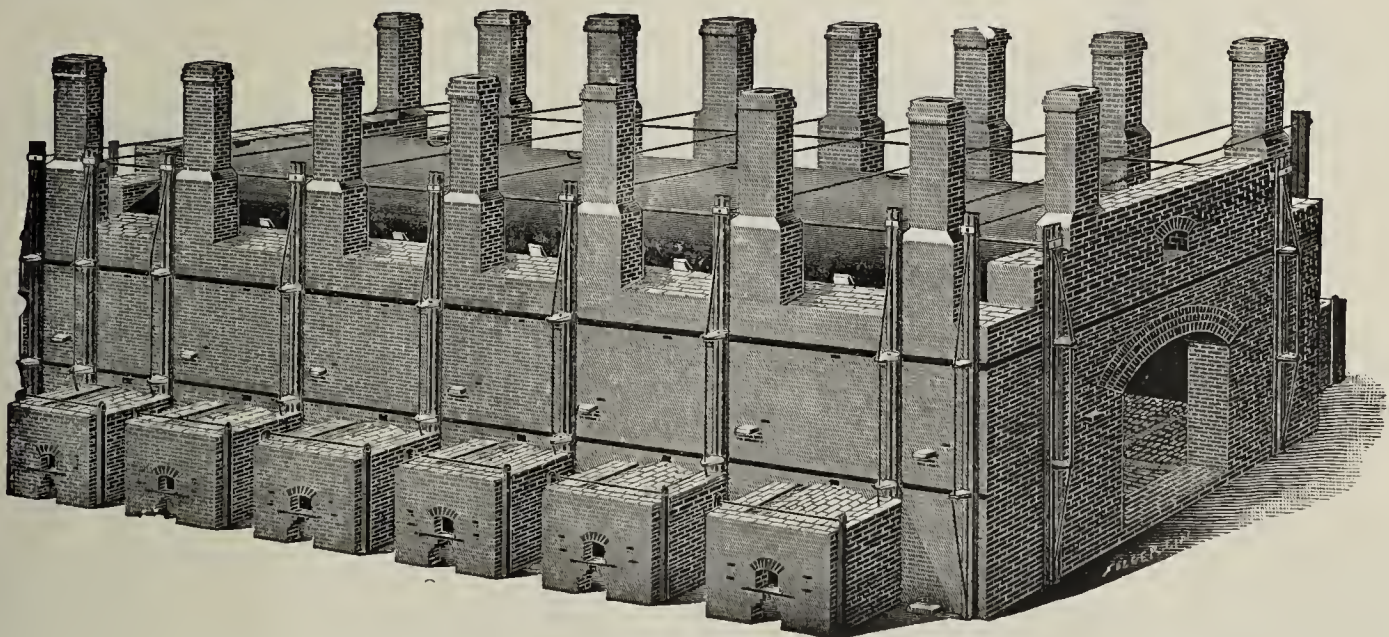
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

To all Whom it May Concern.

The AMERICAN CLAY-WORKING MACHINERY CO.,

Replies to the Chambers Brothers Company's Circular in Reference to Decision in Patent Suit for Infringement against J. W. Penfield & Son.

PLEASE READ CAREFULLY:

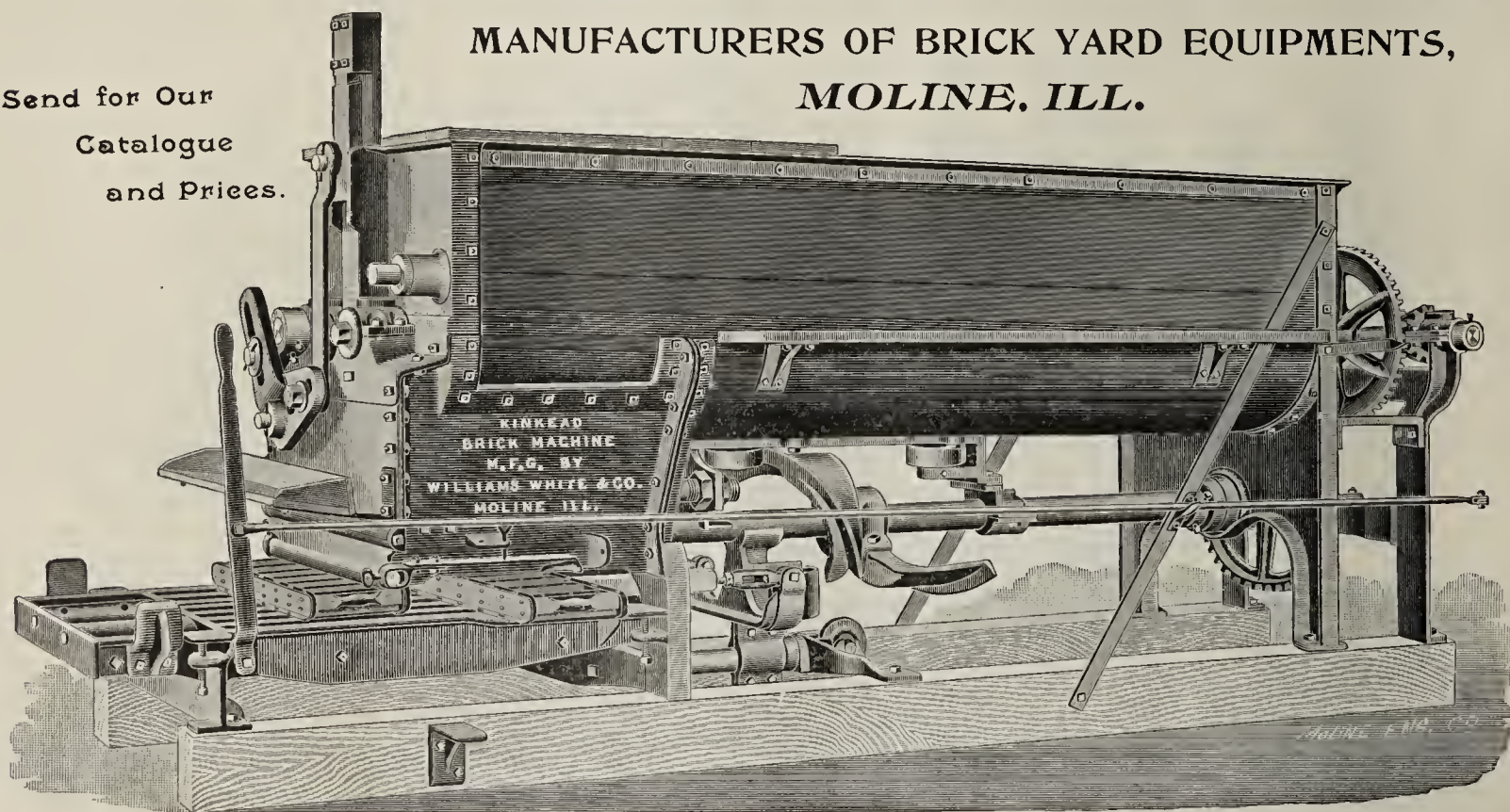
THE AMERICAN CLAY-WORKING MACHINERY COMPANY, of Bucyrus and Willoughby, Ohio, takes pleasure in informing the trade that all of their modern, best and most important brick machines are entirely unaffected by the decision in the case of Chambers Bros. Co. vs. J. W. Penfield & Son. The circular of the Chambers Brothers Company calling attention to this decision in the case is likely to deceive the unwary. Attempt was made by Chambers to have his endless belt cut-off patents Nos. 297,671 and 297,917, broadly construed to cover all revolving cut-offs. This the Court refused to do, and held that the Penfield Machine did not infringe those claims of the two earlier patents. One machine formerly made by J. W. Penfield & Son was held infringed upon patent No. 362,204, but this is an old style machine. None of that class has been built for the last three years. The American Clay-Working Machinery Co. manufactures and sells to the public Cutting Off Machines under the authority and protection of the O. W. Johnston patent No. 478,346, and the John Thompson patent, No. 496,286, which have not been attacked in the Courts by anybody. It is conceded by Chambers Bros. Co. that our primary wheel cut-off machine, manufactured under Patent No. 391 698, sometimes called the French cut-off, ante dates their patent. This machine we manufacture and are now offering to the trade. In addition to the cut off, manufactured under the Johnson patent, No. 478,436 and the Thompson patent, No. 496,286 and Frey patent No. 391,698, we manufacture the Automatic Side Cut-off, the Semi-Automatic Cut-off, the Hand Cut-off, the Combination Cut-off, the Galesburg End-cut Machine and the Frey Wheel End Cut-off Machines. Also machines so arranged as to work satisfactorily, either for end-cut or side-cut brick—none of which are claimed to infringe the Chambers patents. It is not disputed by any one that the American Clay-Working Machinery Co. owns and controls the fundamental patents on this side-cut-off class of machines. Their superiority over the end-cut machines of the Chambers class is too well known and recognized by brick manufacturers to need further comment. Our legal counsel, Messrs, Wood & Boyd, of Cincinnati, Ohio, advise us that our present machines are not infringing any of the claims involved in the Chambers suit. We believe their advice to be sound—therefore we guarantee all parties purchasing and using brick and tile cut-off machines made by us, to hold them harmless from all loss, costs or damages by reason of any alleged infringement of said Chambers patents.

The AMERICAN CLAY-WORKING MACHINERY CO., Bucyrus, Ohio.

WILLIAMS, WHITE & CO.

MANUFACTURERS OF BRICK YARD EQUIPMENTS,
MOLINE, ILL.

Send for Our
Catalogue
and Prices.



The **KINHEAD MACHINE** takes the clay direct from the bank, preparing it more thoroughly than any pug mill or machine on the market. It fills the mold full and sharp every time. It is simple in construction, easy to take care of, and durable.

We solicit correspondence also on complete outfits for brickyards—molds, trucks, barrows, cars of all kinds, elevators, sanders, disintegrators, etc., etc. Get our Mold circular and prices.

(Mention the CLAY-WORKER.)

A Daub of Clay

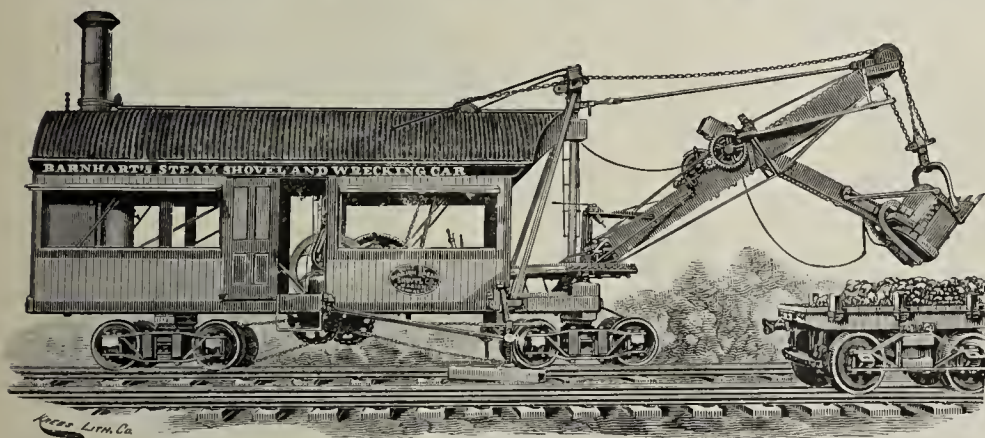


Does not always take this shape by any means; but it would if you knew how. It is all in knowing how. We know how your material should be handled to make just the kind of ware you want. That is part of our business. We also have the proper appliances to make it do what you want of it. We have machinery **for all processes**, so we have no interest in getting you to use something not adapted to your clay. We adapt the machinery to the clay, not the clay to the machinery. Which is the better way?

Specialty for August—Dryer Cars, Combination single and double deck. Something new.

Chicago Brick Machinery Co., 225 Dearborn Street.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

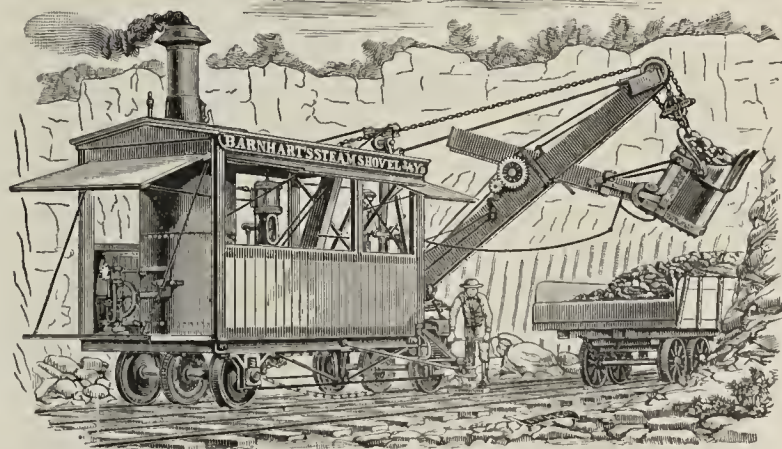
We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.



STYLE C—¾ YD.

Do You Want

A BRICK MACHINE A DRY PAN A PUG MILL?

IF SO DON'T FAIL TO

Get
Our
Prices,



They
Can't
... be
Beat.

.....

WOOLLEY'S MACHINERY is built on mechanical lines and of the best material. Our "**Iron King**" is a non-breakable brick machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ability of every part.

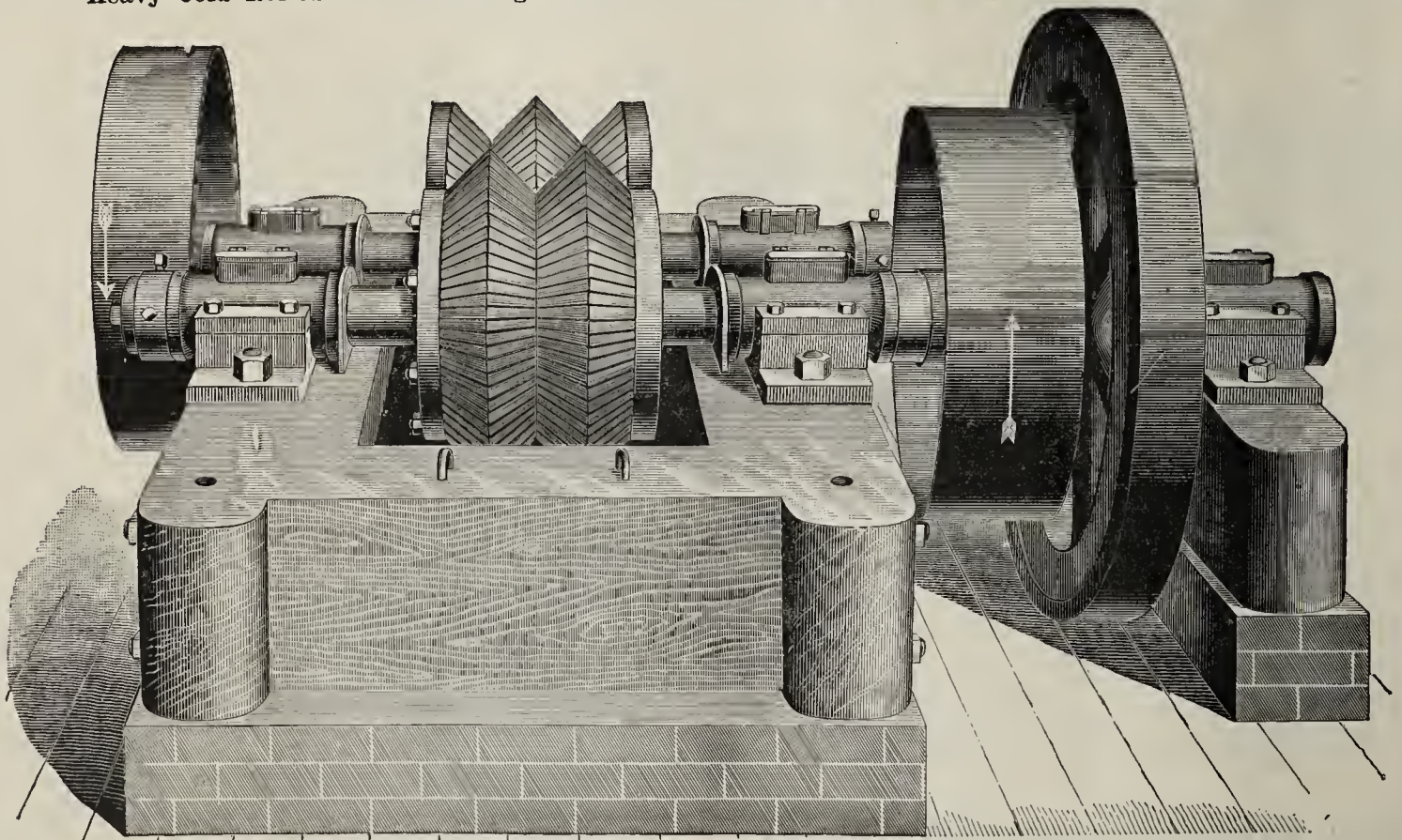
We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

It will afford us pleasure to correspond with you.

Mention the Clay-Worker

NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeier Building
26 Cortland and 21 Dey Streets, New York, U. S. A.

DECISION IN FAVOR OF CHAMBERS

IN THE
Infringement Suit Against J. W. Penfield & Son
ON
Brick Machine Patents Owned by Chambers Bros. Co.
PHILADELPHIA, PA.

NOTICE

To the Public Generally and to Manufacturers and Users of Wire Cut-off Brick Machines Especially.

After a protracted litigation, in which the defendants, with the aid of able legal counsel, contested every point and raked Europe and America to find something that would defeat our patents, the **United States Circuit Court at Cleveland, Ohio**, in the suit brought by us against J. W. Penfield & Son, has sustained as good and valid all of the essential and important claims in suit covering the endless belt or carrier and the wheel wire cut-off Brick Machines of our basic patents, No. 297,671, No. 297,917, and No. 362,204, besides certain claims for minor features of construction of these and other of our patents.

We are advised by our counsel (Joshua Pusey, Esq., of this city) that all machines constructed or used, without license from us or our predecessors, and operating on the principles of the endless belt or carrier machine of patents Nos. 297,671 and No. 297,917, are infringements of said patents.

Also, that all such unauthorized wire cut-off machines having a rotating wheel carrying cut-off wires and having a cam, or cams, for guiding, or regulating, the movement of the wheel so that the wires will take their proper path through the moving bar of clay in severing the latter into bricks, and means for causing the cut-off wheel to move in unison with the bar, are infringements of patent No. 362,204.

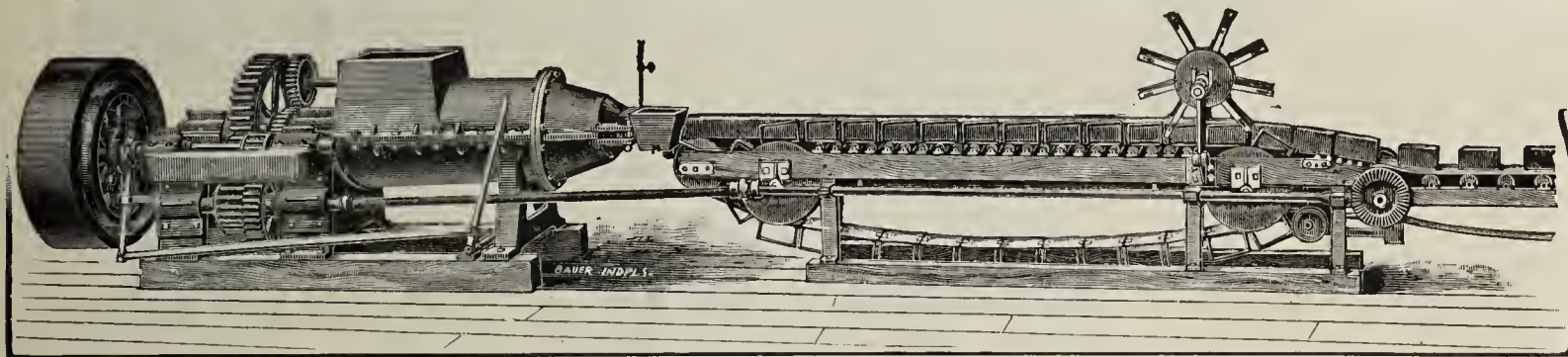
Also, that all such unauthorized machines having in combination with the cut-off wheel and the cam, or cams, a positively driven friction belt, for aiding in driving said wheel, are infringements of the last mentioned patent.

Also, that all such unauthorized machines having endless belts or carriers, or wheels, with U-shaped elastic bows secured thereto for holding the cut-off wires, infringe, respectively, patents Nos. 297,671, and 297,917, and 362,204.

All manufacturers and users of Brick Machines infringing the said patents and claims of other of our patents that were adjudged to be valid in the case against J. W. Penfield & Son will please take notice that we intend enforcing our rights in said patents and in all others owned by us.

CHAMBERS BROTHERS COMPANY,

Fifty-second St. below Lancaster Ave., Philadelphia, Penn., U. S. A.



SYRACUSE, N. Y., July 22nd, 1897.

LEADER MFG. CO., Decatur, Ill.

Gentlemen:—We presume you would be pleased to know what luck we are having with your two Leader Steam Re-presses bought last spring. To say we are pleased does not half express it. We are making better brick with them than we made last year on our Hand Re-presses, (and they were in first class order.) We did not expect to make a better brick by steam power than with hand, but we are doing it every day. Expert machine men from other companies have been on the yard and all acknowledge they are doing grand work. There has been no perceptible wear so far and they work right along like a thing of life. We are satisfied you have one of the best Re-presses ever put on the market.

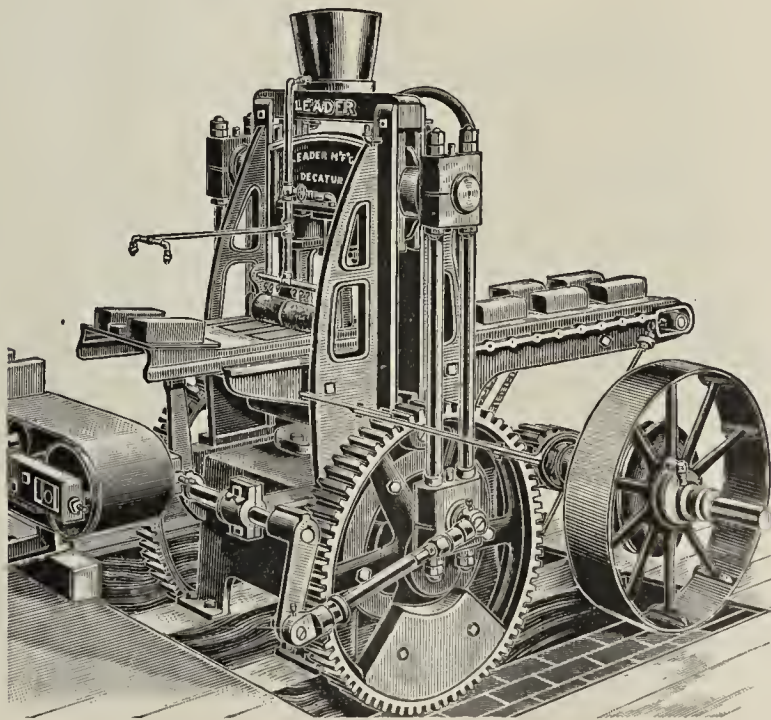
Yours very truly,

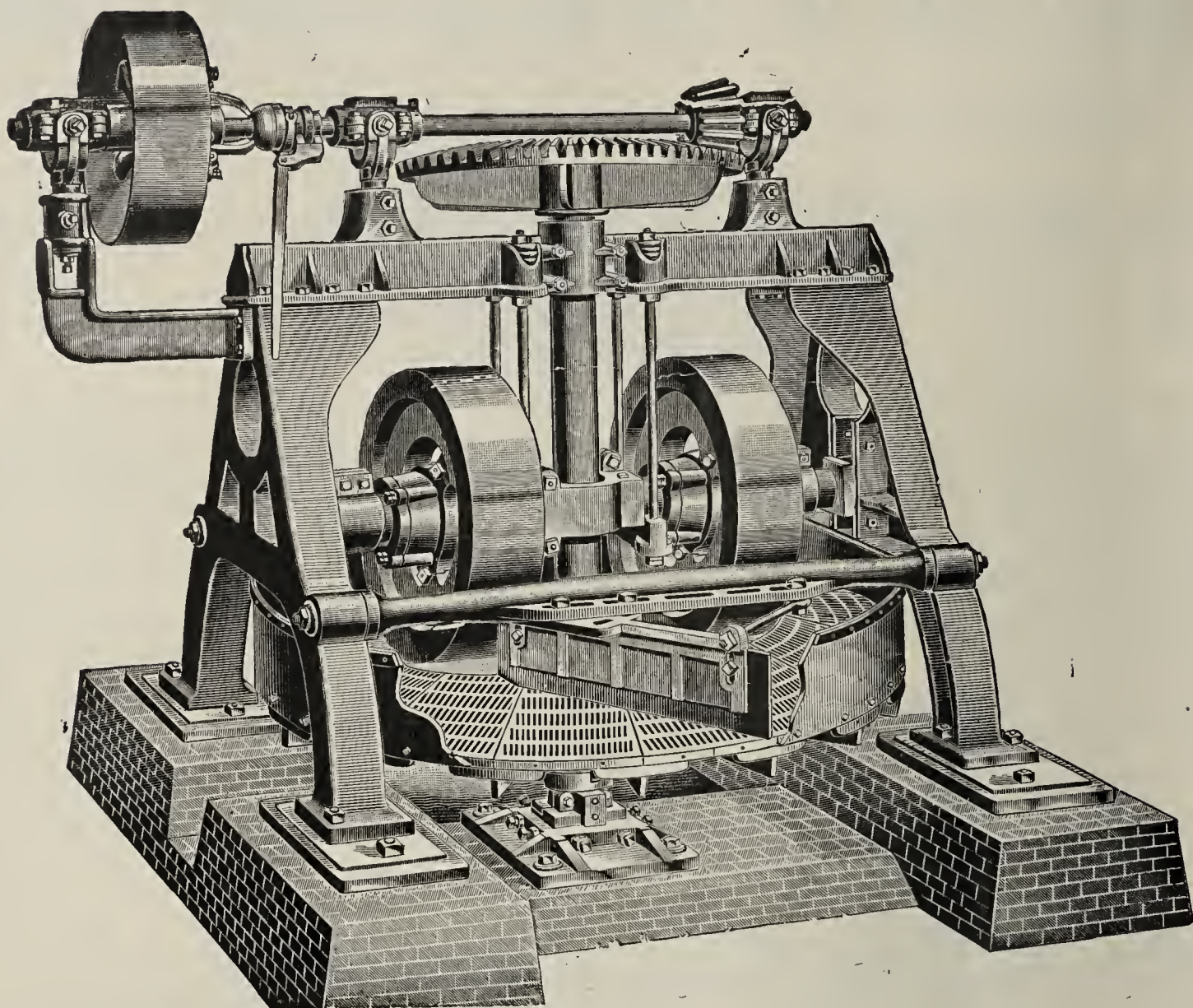
C. and L. MERRICK.

We have pleased several and can please you. Complete line of new, and bargains in second-hand machinery.

Leader Manufacturing Co.,

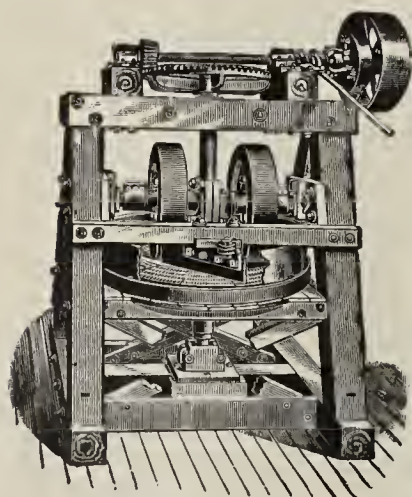
Decatur, Ill.





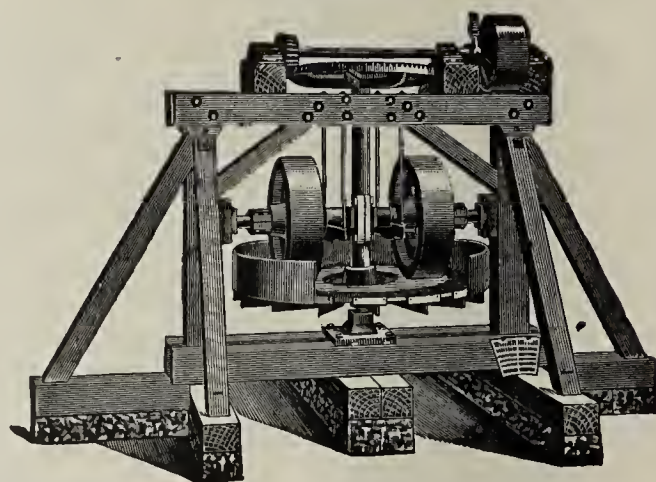
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,
WOOD FRAMES.

~~~~~  
All Sizes and Price  
to suit  
Any Size Plant.  
~~~~~



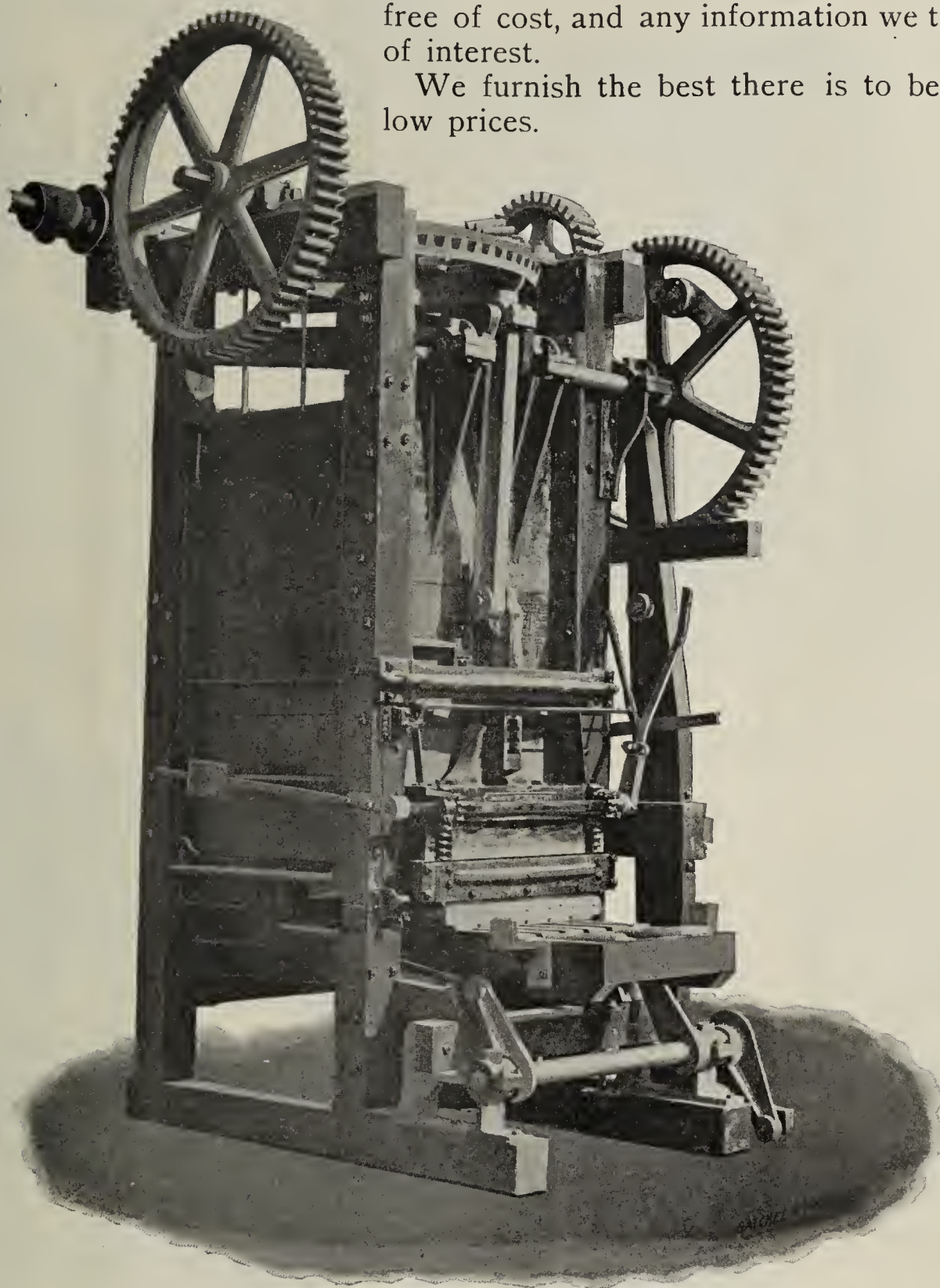
.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.

We Furnish Everything a Brickmaker Needs.

Let us furnish you with any information you want. We send plans of complete plants free of cost, and any information we think will be of interest.

We furnish the best there is to be had and at low prices.



Letter "A" Weight 10,000 Pounds.

ESTABLISHED 1857.

INCORPORATED 1887.

The Henry Martin Brick Machine Mfg. Co.,

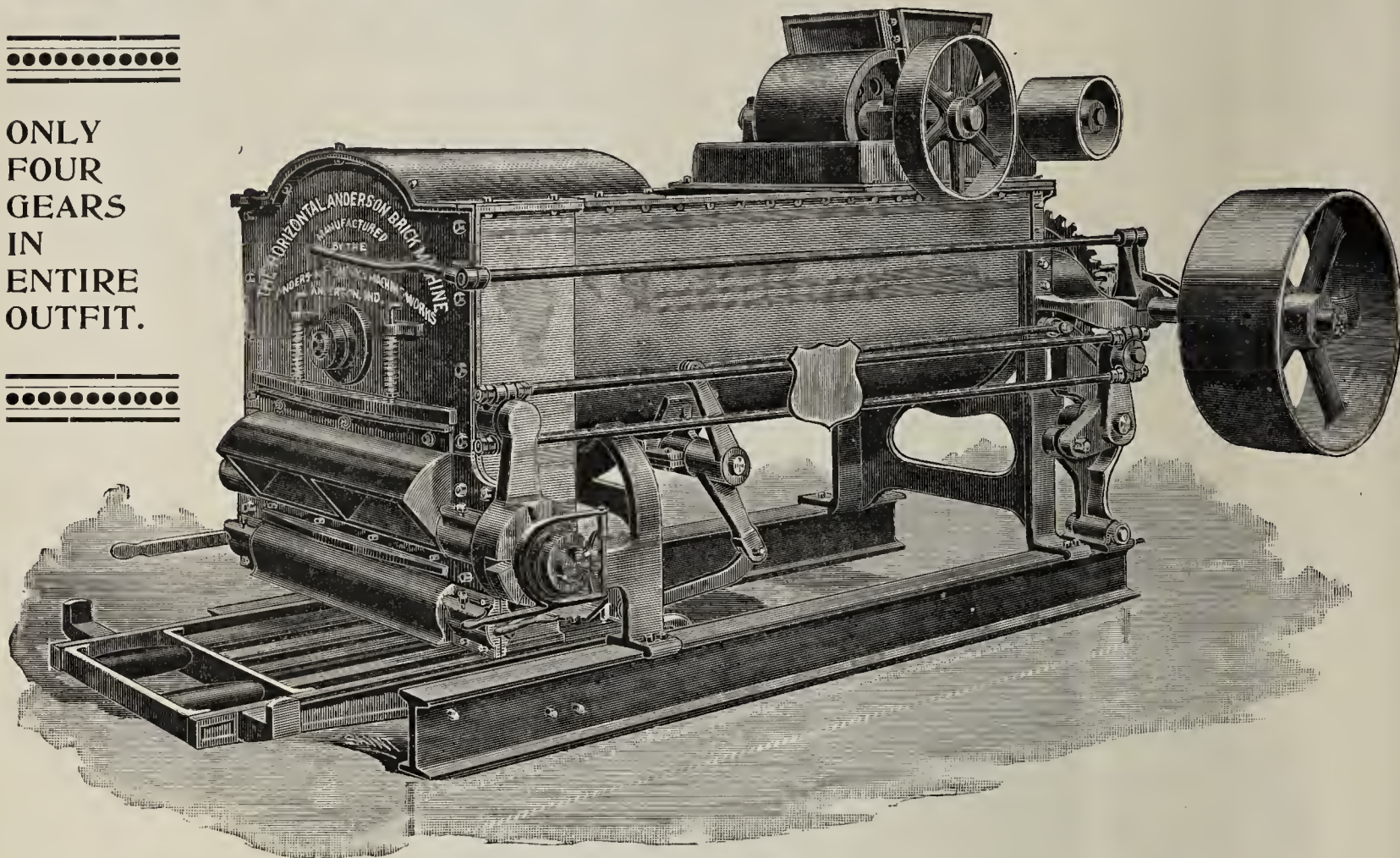
Send for our Illustrated Catalogue.

Lancaster, Penna., U. S. A.

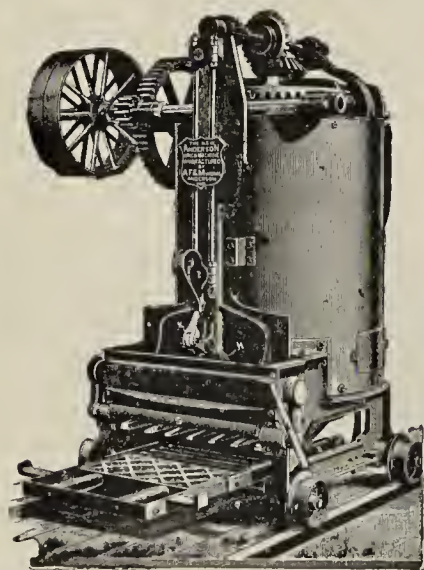
DON'T

Buy a Brick Machine until you Investigate the **HORIZONTAL ANDERSON**. The latest — the Strongest — Greatest Pressure and Puging Capacity.

ONLY
FOUR
GEARS
IN
ENTIRE
OUTFIT.

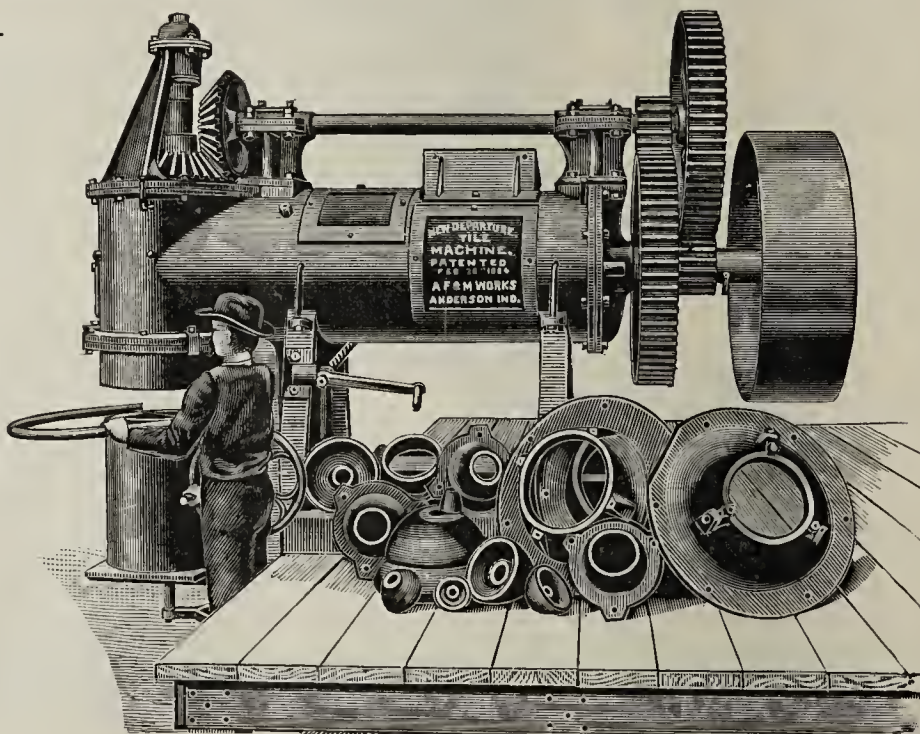


Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.

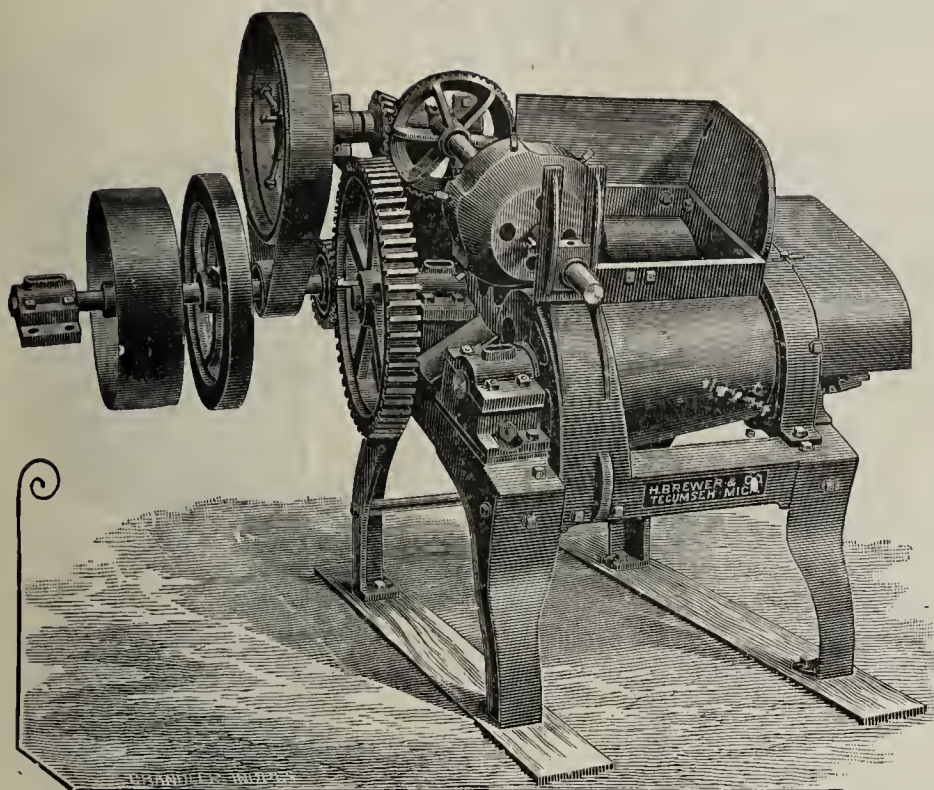


NEW DEPARTURE TILE MILL.

The NEW DEPARTURE TILE MILL.

The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

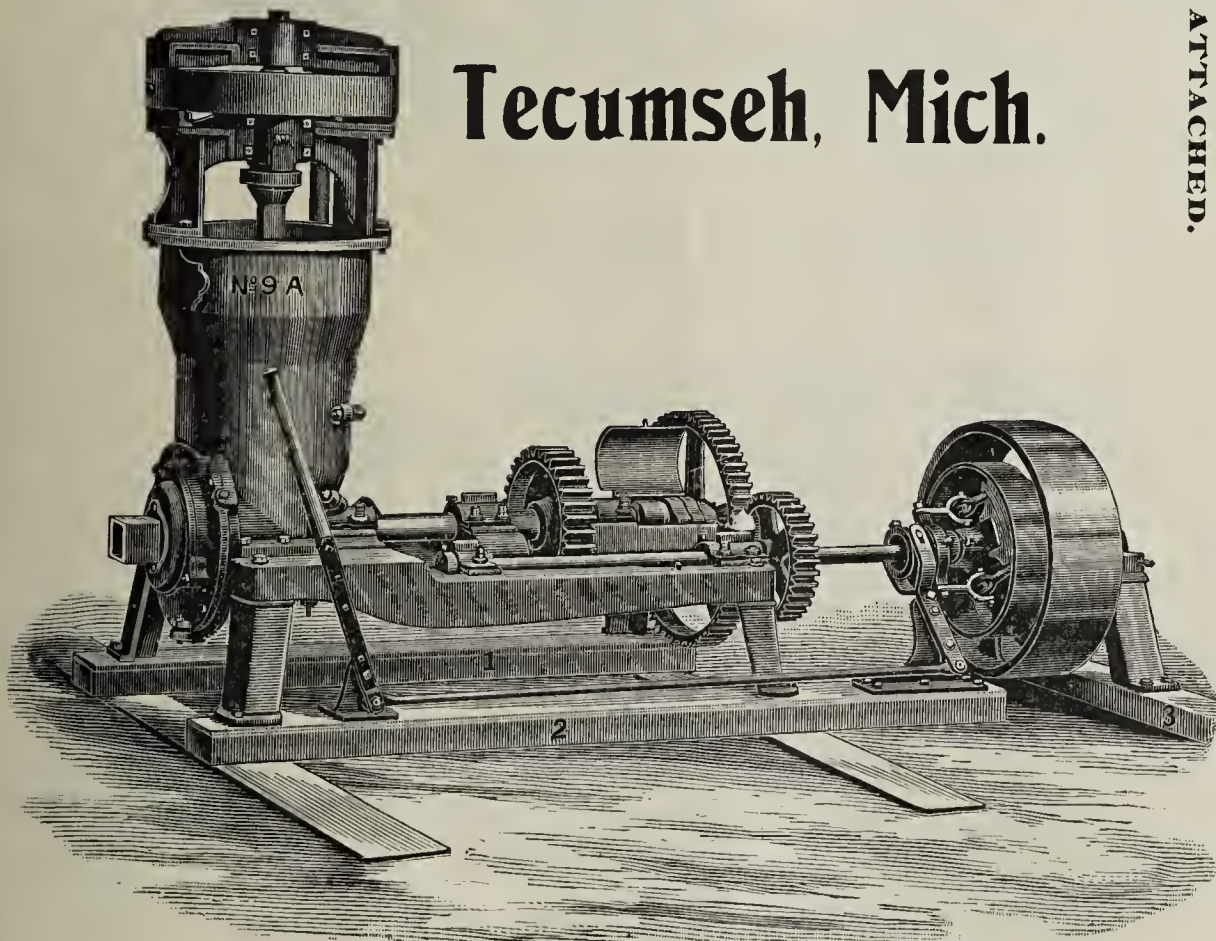
THE ANDERSON FOUNDRY & MACHINE WORKS, Anderson, Indiana



STONE EXTRACTING CLAY CRUSHER.

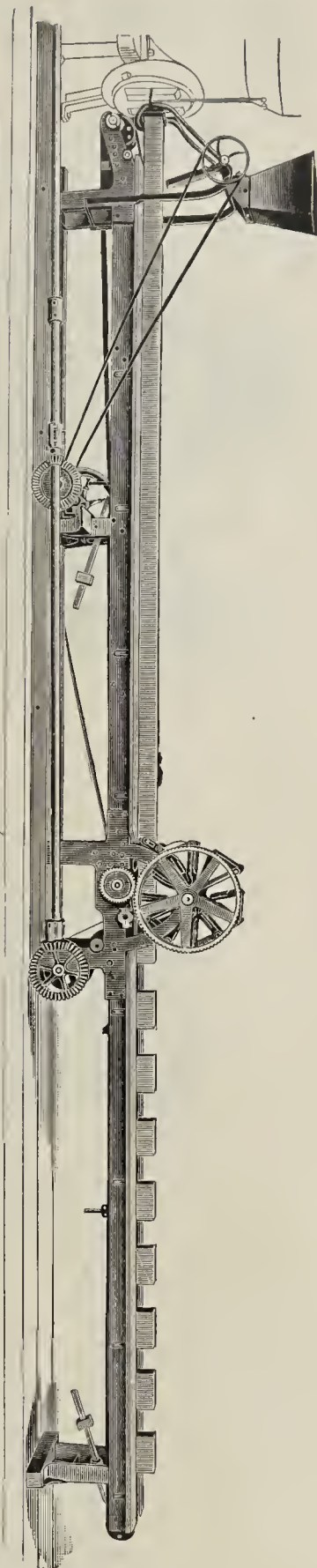
Manufactured by

H. Brewer & Co.,
Tecumseh, Mich.

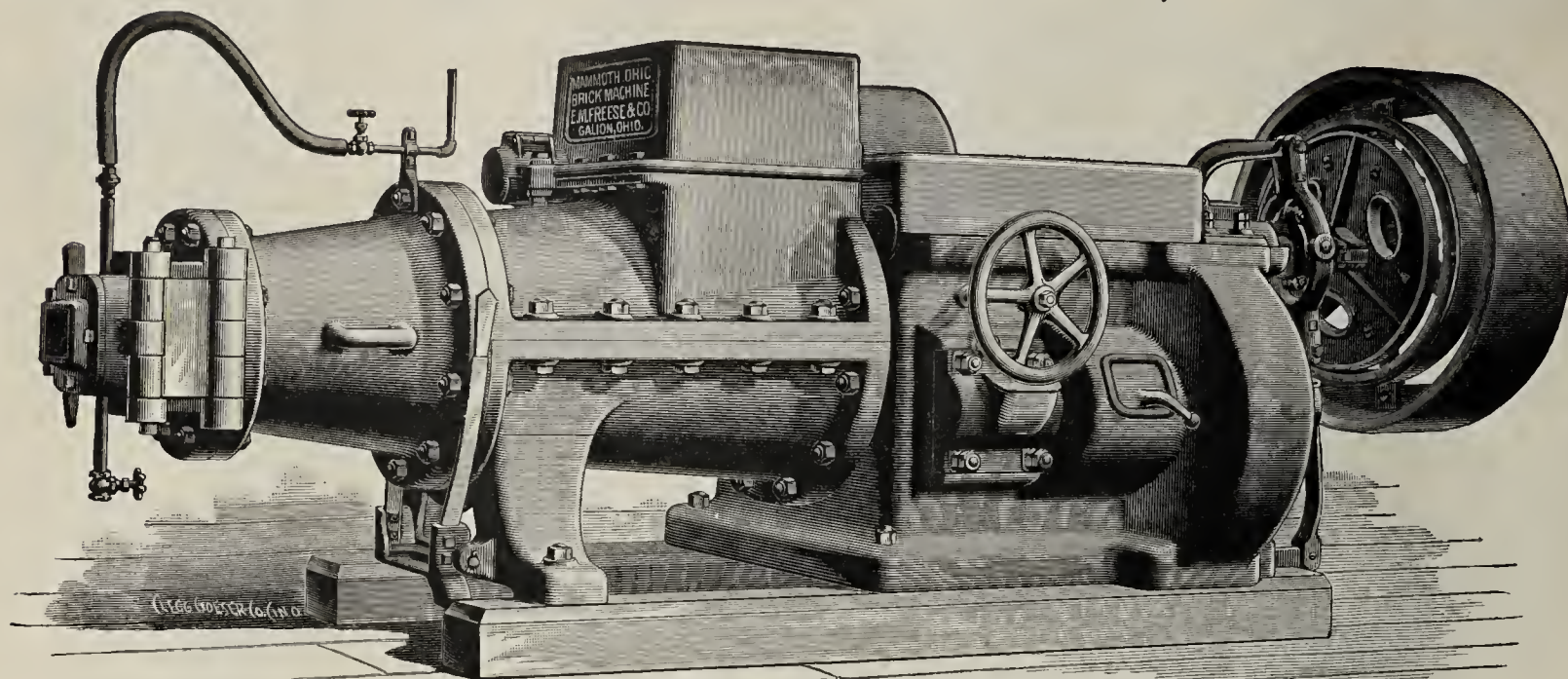


No. 9 "A" BRICK MACHINE.

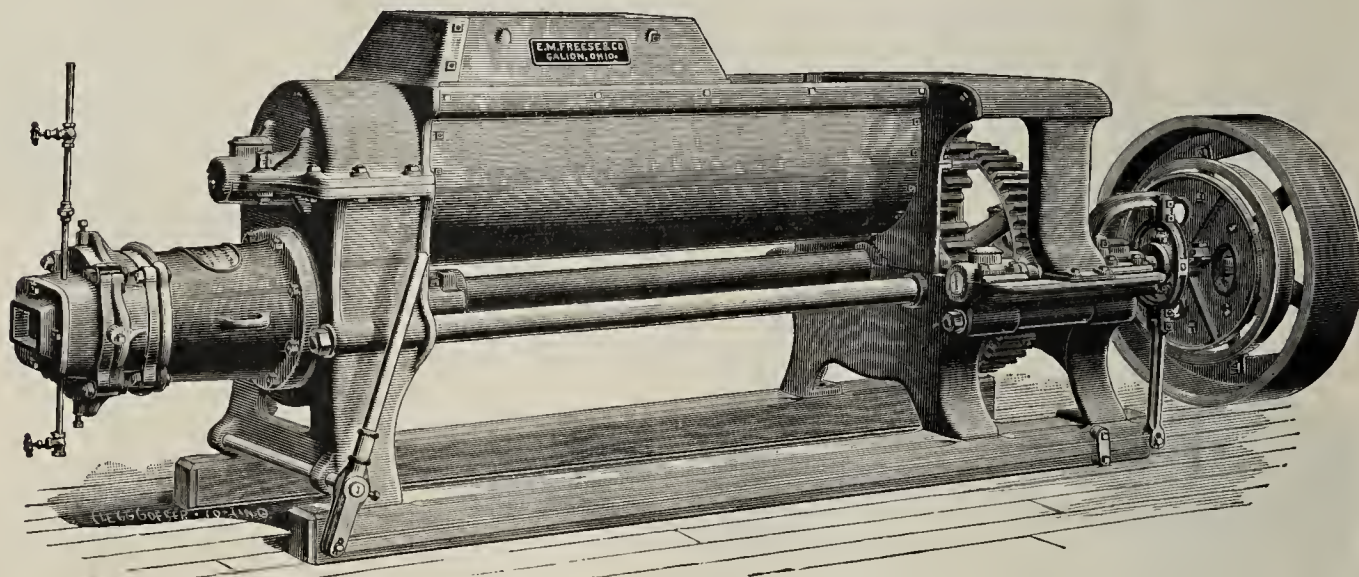
AUTOMATIC END CUT BRICK CUTTER with SANDER ATTACHED.



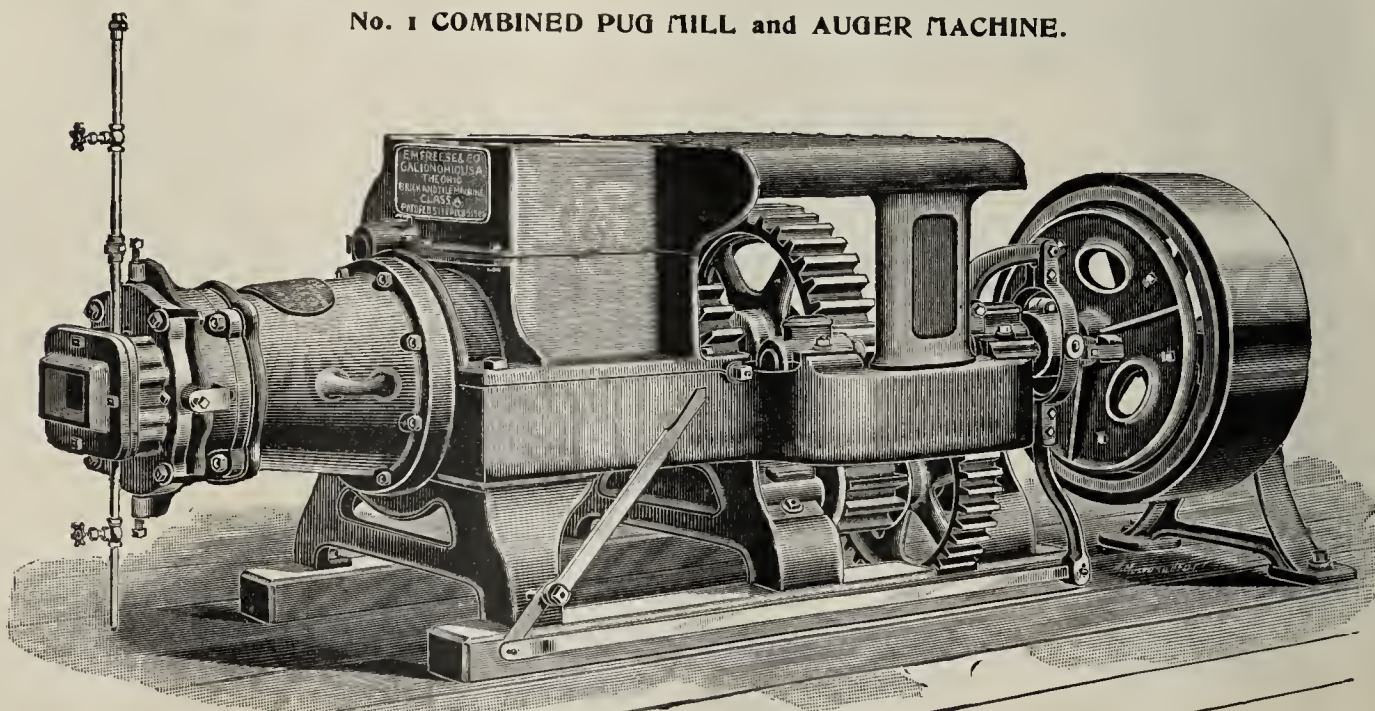
E. M. FREESE & CO., GALION, OHIO.



MAMMOTH BRICK MACHINE.



No. 1 COMBINED PUG MILL and AUGER MACHINE.



IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

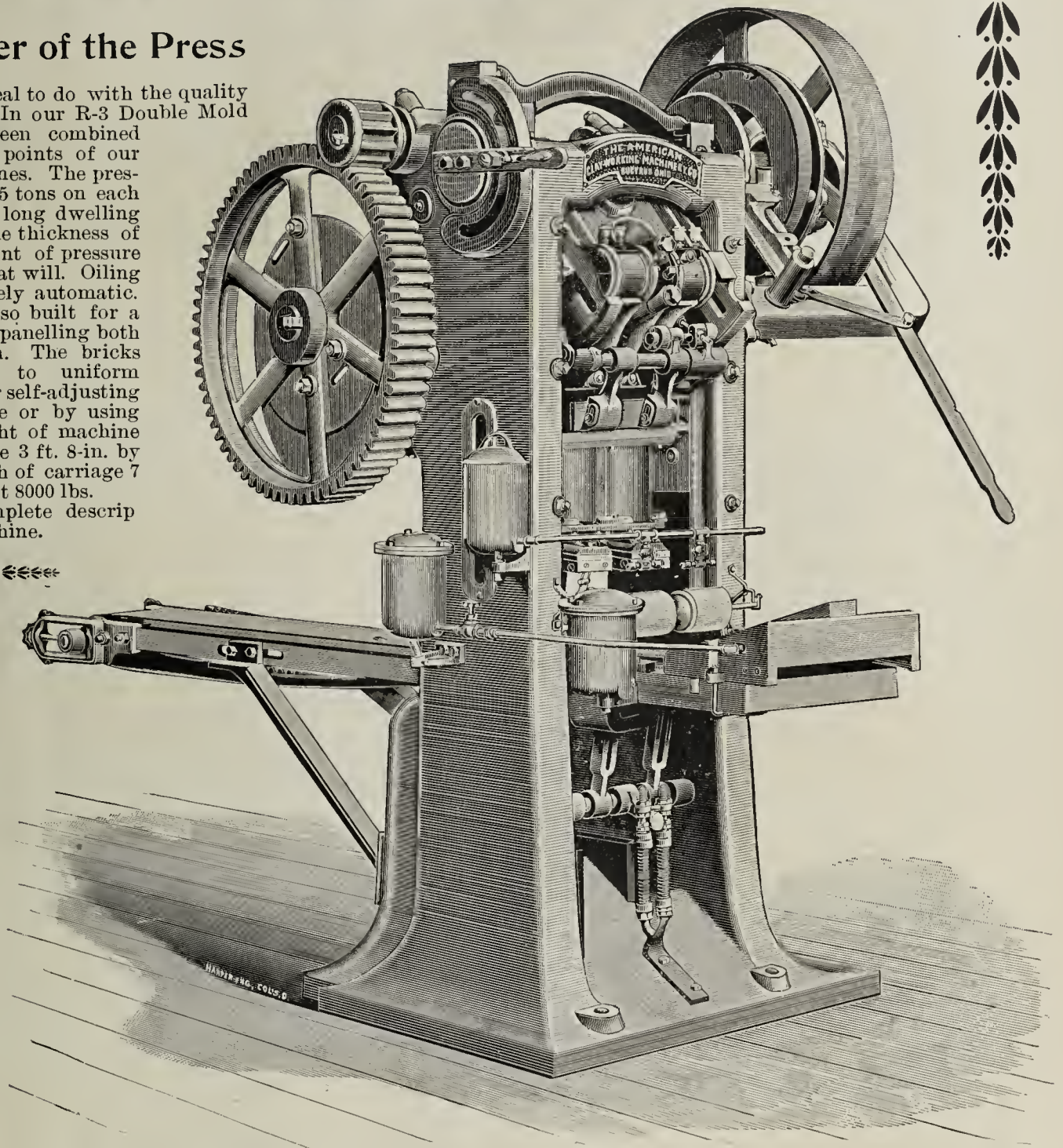
Send for 136 page Catalogue.

"The Power of the Press."

The Power of the Press

Has a great deal to do with the quality of the brick. In our R-3 Double Mold Repress has been combined numerous good points of our dry press machines. The pressure is direct 125 tons on each brick. It has a long dwelling impression. The thickness of brick and amount of pressure can be changed at will. Oiling devices absolutely automatic. This press is also built for a panelling press, panelling both top and bottom. The bricks being brought to uniform thickness by our self-adjusting panelling device or by using the vent. Height of machine 8 ft. 10-in.; base 3 ft. 8-in. by 3 ft. 6-in.; length of carriage 7 ft. 6-in. Weight 8000 lbs.

Send for complete description of this machine.



We manufacture everything used in the clay manufacturing business.
Write for our complete catalogue.

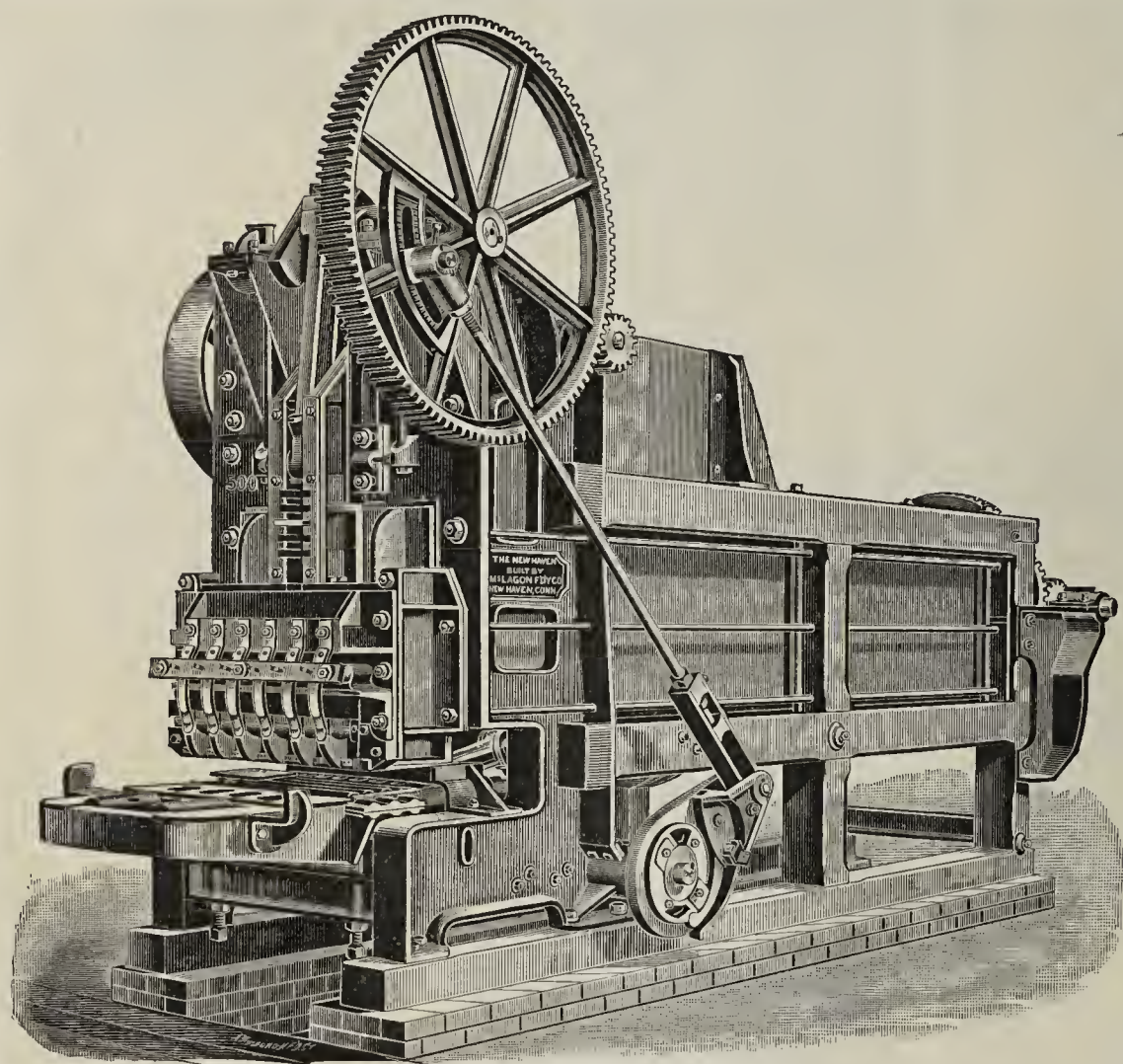


The American Clay-Working Machinery Co.,

Bucyrus, Ohio, U. S. A.

“New Haven” Brick Machinery,

Solid, Strong, Substantial Structures.



Soft Clay Ma-
chinery is Our
Specialty.

• •

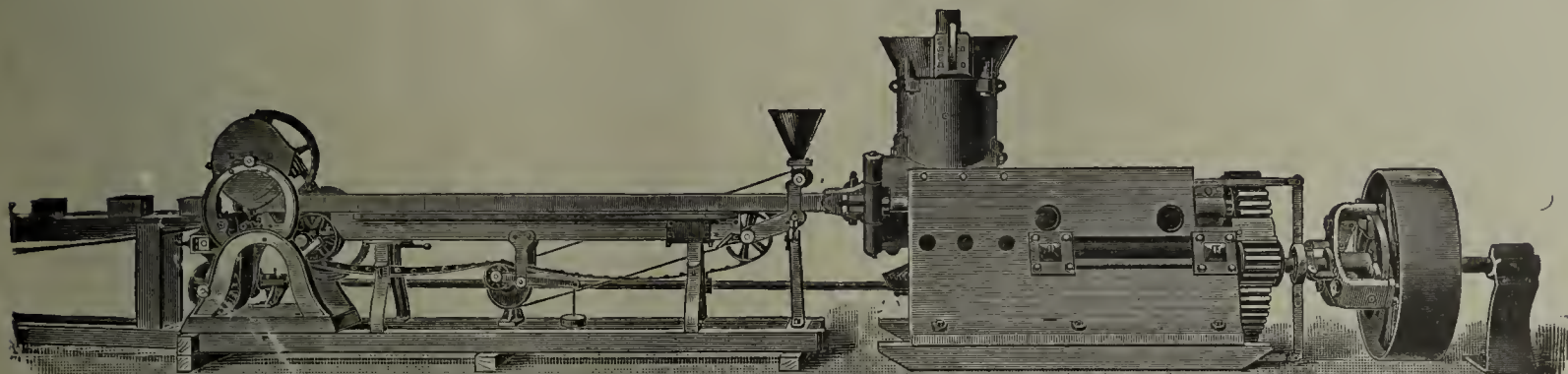
We propose to
Please each Pa-
tron.



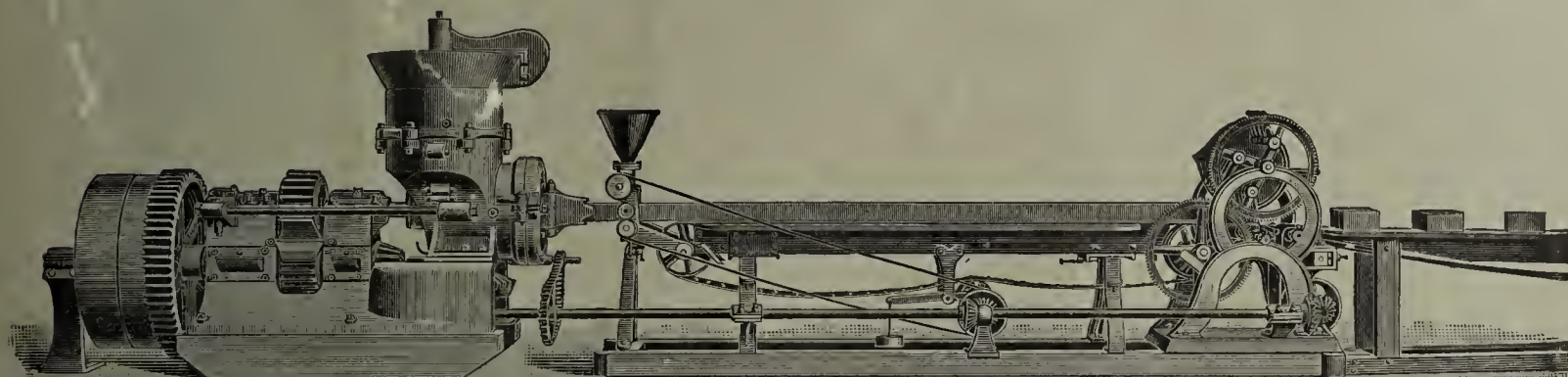
SEARCHING INQUIRY SOLICITED.

The Eastern Machinery Co.,
NEW HAVEN, CONN.

WONDER MACHINERY.



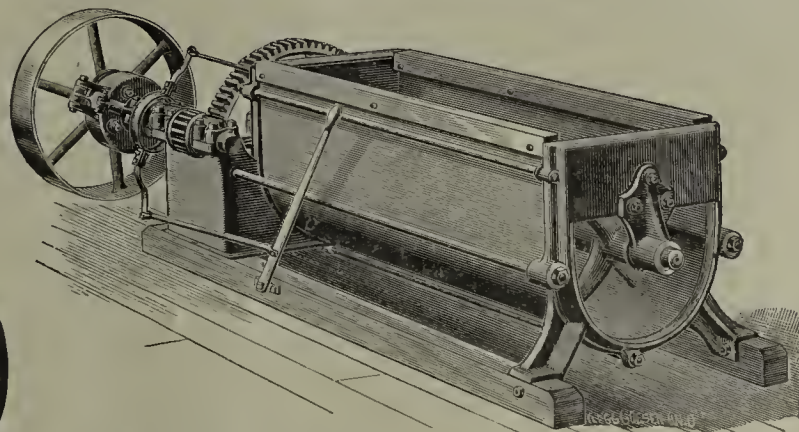
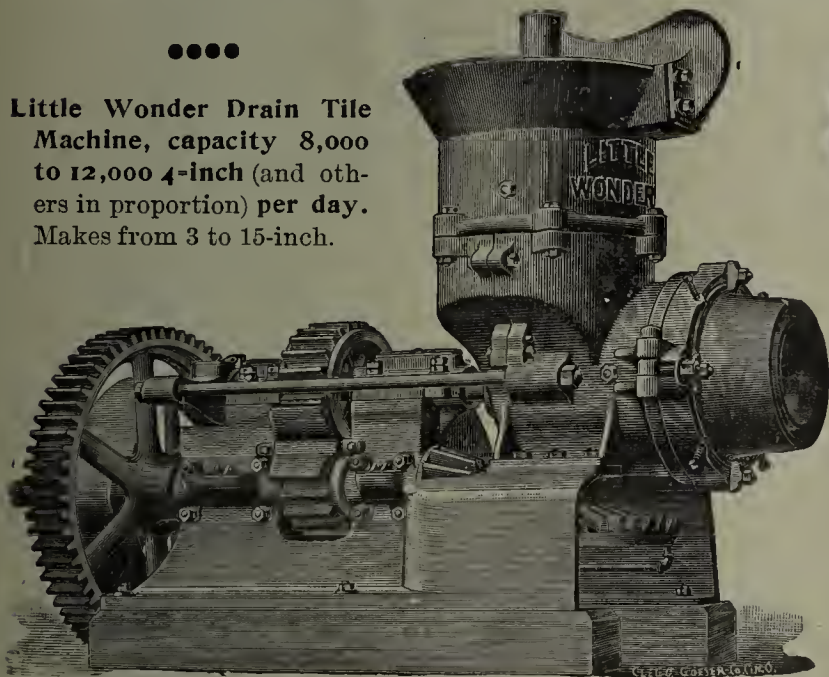
Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.



Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

••••

Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity.

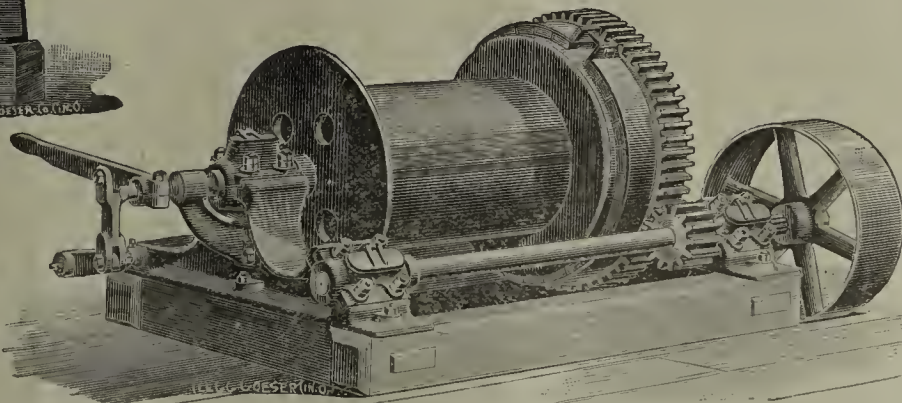
MANUFACTURED BY

The Wallace Mfg. Co.,
Frankfort, Ind.

CHICAGO AGENT:

Chicago Brick Machinery Co., Chicago, Ill.

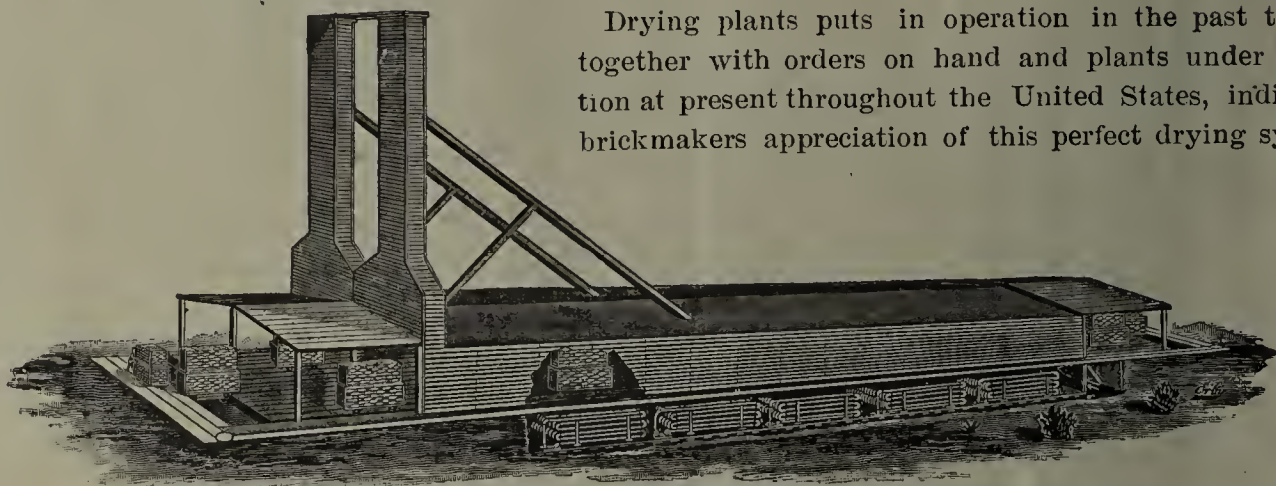
Catalogue Free.



18 x 30 Friction Geared Hoisting Drum.

Iron Clad Dryer.....IN THE LEAD

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

•→SEE WHAT THEY SAY:←•

WM. SANKEY, THOS. SANKEY,
WM. E. SANKEY, F. M. SANKEY,
T. H. SANKEY, J. F. SANKEY.

CAPACITY: 40,000 BRICK PER DAY.

TELEPHONES: { OFFICE, S. S. 11-3.
WORKS, S. S. 11-2.
WORKS, E. E. 589.

SANKEY BROS., BRICK.

ORNAMENTAL PRESSED, SELECT STOCK, BUILDING, PAVING AND GUTTER BRICK.

SPECIAL AGENTS FOR MARTIN'S IMPROVED BRICK MACHINE.
RAILROAD SHIPPING A SPECIALTY.

OFFICE: 2101 Carson Street.

WORKS: Head of 18th Street, S. S.
Penn and Atlantic Aves., E. E.

PITTSBURGH, PA., May 3, 1897.

WOLFF DRYER CO., Chicago, Ill.

Gentlemen:—Replying to your inquiry regarding dry house at our east end plant, will say, that it is two years since we equipped that yard. We found the earthy deposit there would make the best quality of stock brick; soft mud process, but would not stand direct heat drying; such as we were accustomed to use, therefore concluded to test this brick in your dryer, resulting in our installing your system, producing results of a most satisfactory nature, proving the excellence and correctness of your system of absorbing moisture from centre to surface by drawing a volume of warm air through the brick, carrying off the moisture and leaving our brick perfect and bone dry, saving us money in burning and producing beautiful color.

Six months experience proved to us that it would pay to install your system at our South side works, which we did one year ago, with equal satisfaction. At this yard, we have shale clay manufacturing soft mud and dry-press brick and was equipped with the best kind of dry floor, heat supplied from natural gas; we sacrificed this and built an Iron-Clad under the same roof. This loss has been our gain; the quality of brick and saving in cost of drying enables us to show a fair profit, which is very pleasing, considering prevailing low prices for brick. We dry all our dry-press brick before setting in the kiln.

Respectfully yours,

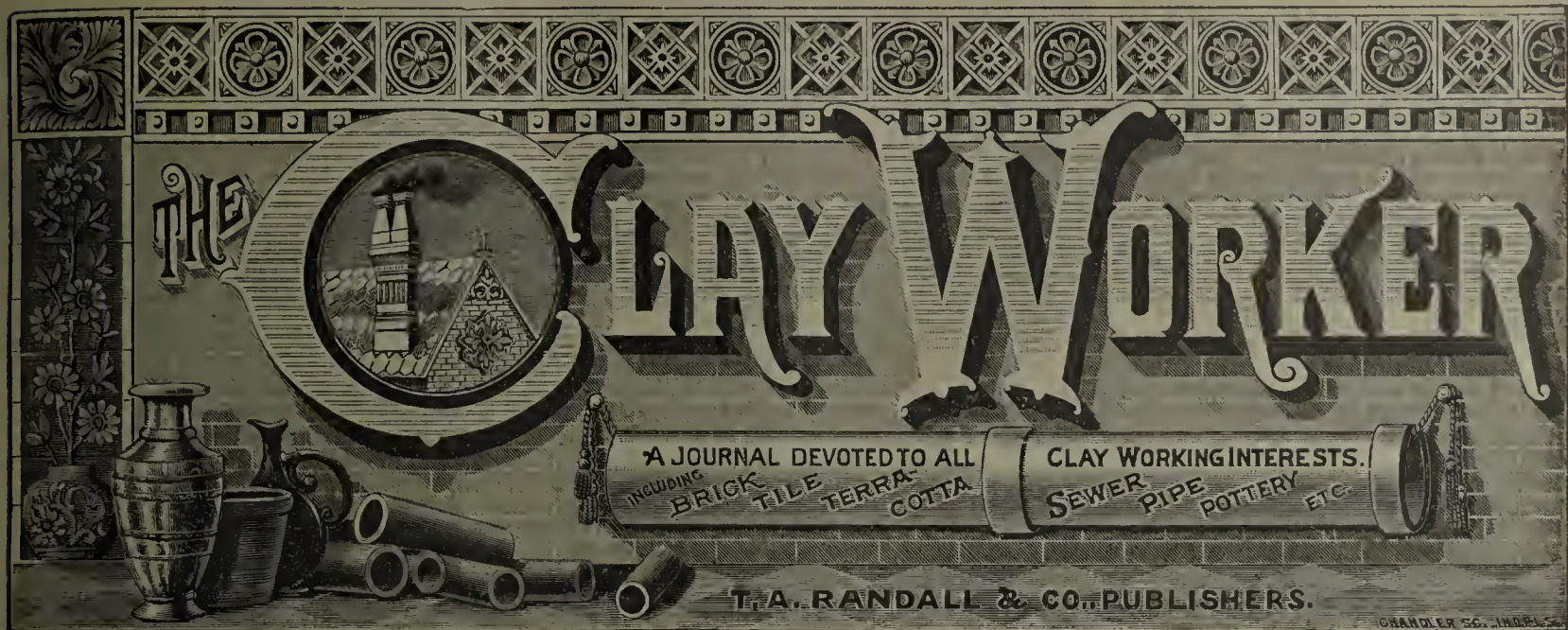
SANKEY BROTHERS.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVIII, No. 3.

INDIANAPOLIS, IND., SEPTEMBER, 1897.

\$2.00 a Year in Advance.

OUR SPECIALTY IS STIFF TEMPERED BRICK MAKING ...MACHINERY.

We aim to Build only the Best in its Class.

It has Paid our Customers to Buy and Use our Machines.

We Believe it would Pay You.

FOR SALE

One second-hand plain slide-valve Steam Engine, 12-24-inch cylinder, with pulley fly-wheel 8 feet in diameter by 17-inch face. Engine complete with governor and stop-valve, and by maker of good reputation. We will put in order and place f. o. b. cars Philadelphia for \$250. Address

Chambers Bros.' Co.

Philadelphia, Pa.

Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,

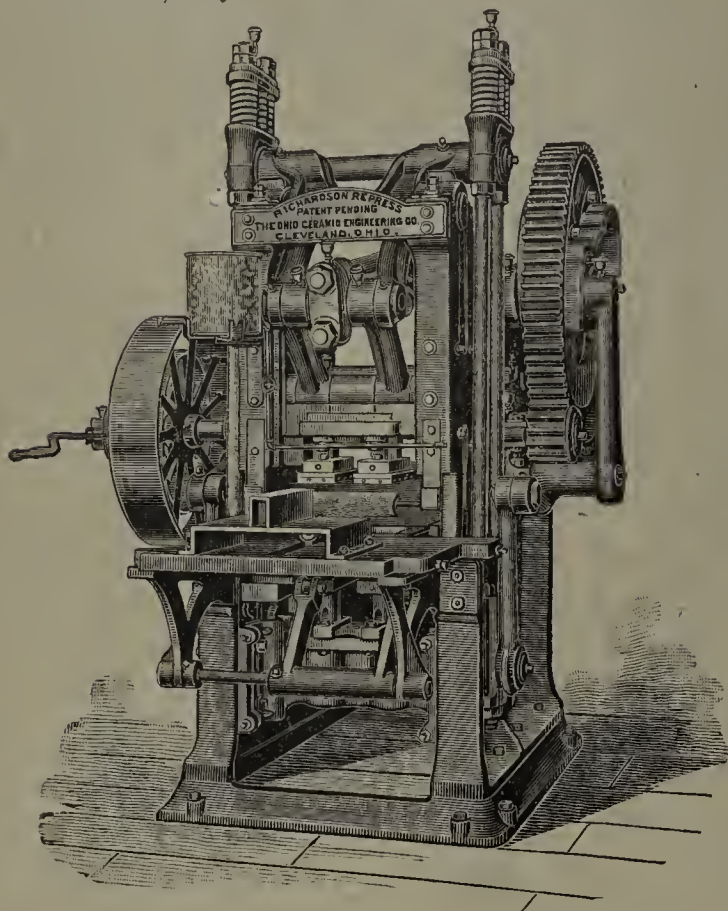
171 South Canal Street.

PHILADELPHIA, PA.

SAYREVILLE, N. J., August 16, 1897.

"We now have three of your represses in operation at our works—two standard size and one 12"x4"x1½" size. Would say that they are giving us very good satisfaction, press the brick well and we have no fault whatever to find with them. Can cheerfully recommend them to any party desiring steam repress.

"Yours truly, SAYRE & FISHER CO.
"E. A. FISHER, Sec'y.



TO THE KLONDYKE

FOR GOLD,

May allure and

Disappoint many,

But for

Sure Success

BUY A "RICHARDSON"

To press Your Brick,

Then you will soon have both Gold and
Glory.

Quality, Quantity, Economy,
This is what we guarantee.

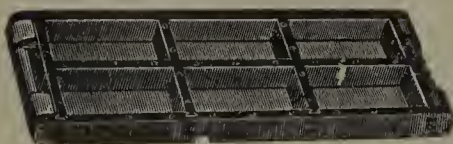
The Ohio Ceramic Engineering Co.,
59-63 Center St. Cleveland, Ohio.

Brick Moulds at a Discount.

On and after June 1st, you can get 20 per cent off the list on Machine Moulds and other supplies, at reduced prices. If you have not got the LIST, send for it. Address the largest and most complete works of the kind in the world.



3 Brick Hand Mold.



6 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

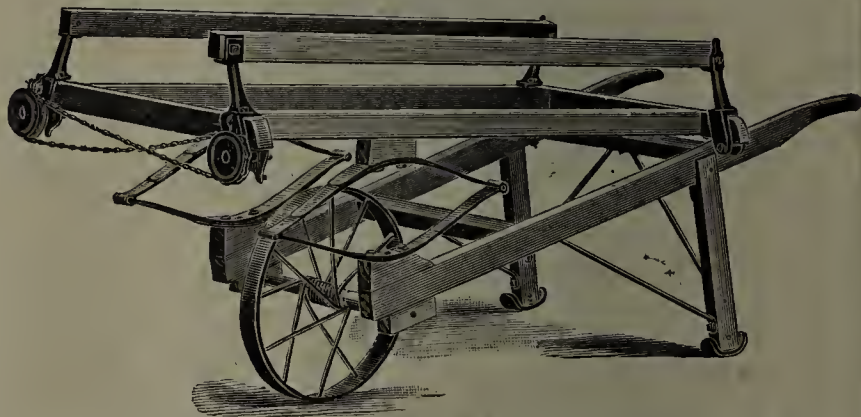
Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

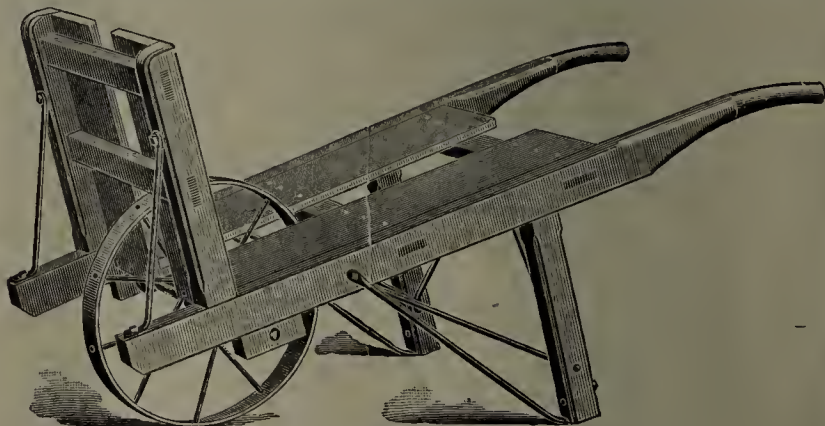
Send for catalogue and price list. Address,

D. J. C. ARNOLD, New London, Ohio.

TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market.
BARROWS, For various purposes. Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind

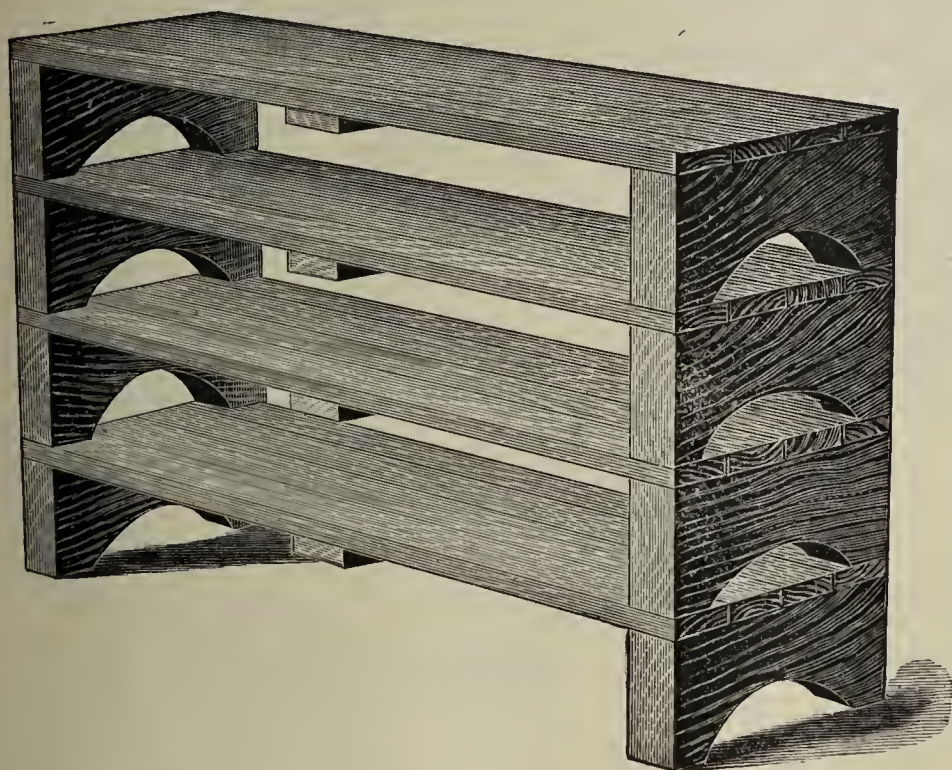


No. 4 Brick Barrow.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.



IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.

Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

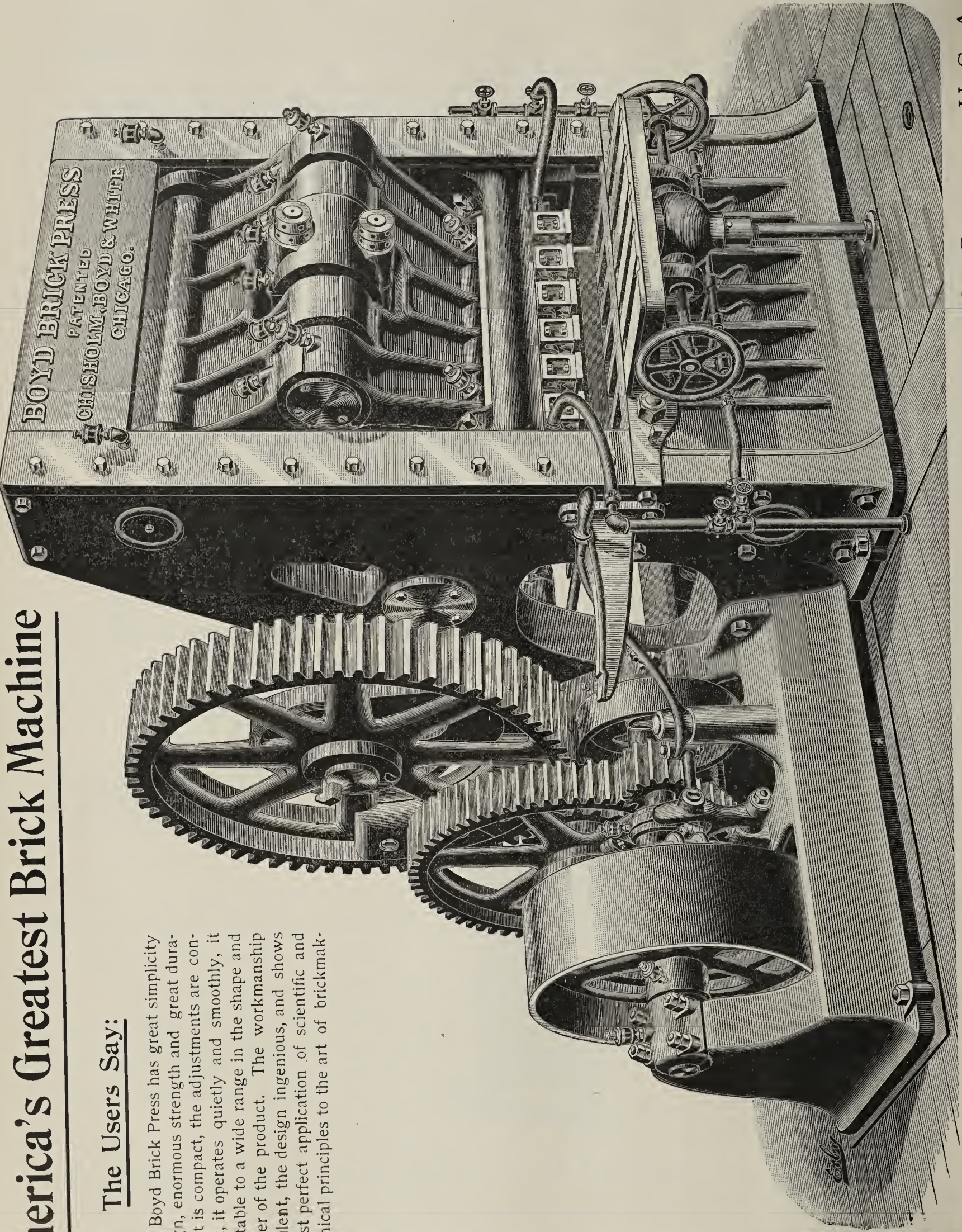
W. B. MERSHON & CO., - Saginaw, East Side, Mich.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."

THE CLAY-WORKER



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

"The Survival of the Fittest."

WE ARE IN THE BUSINESS TO STAY AND WILL NOT BE UNDERSOLD.

....

CLAY WORKING MACHINERY

The Simpson Brick Press

The World's Standard.

....

Used by all Successful Brick Yards Throughout the United States and Canada.

....

We Manufacture a Complete Line of Clay Working Machinery.
Write for Catalogues.

....

DO NOT EXPERIMENT.
INVEST YOUR MONEY IN A SURE THING.

....

Complete Plants Constructed and Guaranteed.

....

The Simpson Brick Press Co.,

Manufacturers and Contracting Engineers.

OFFICE AND WORKS:

77th and Jackson Ave. (Formerly Storms Ave.)

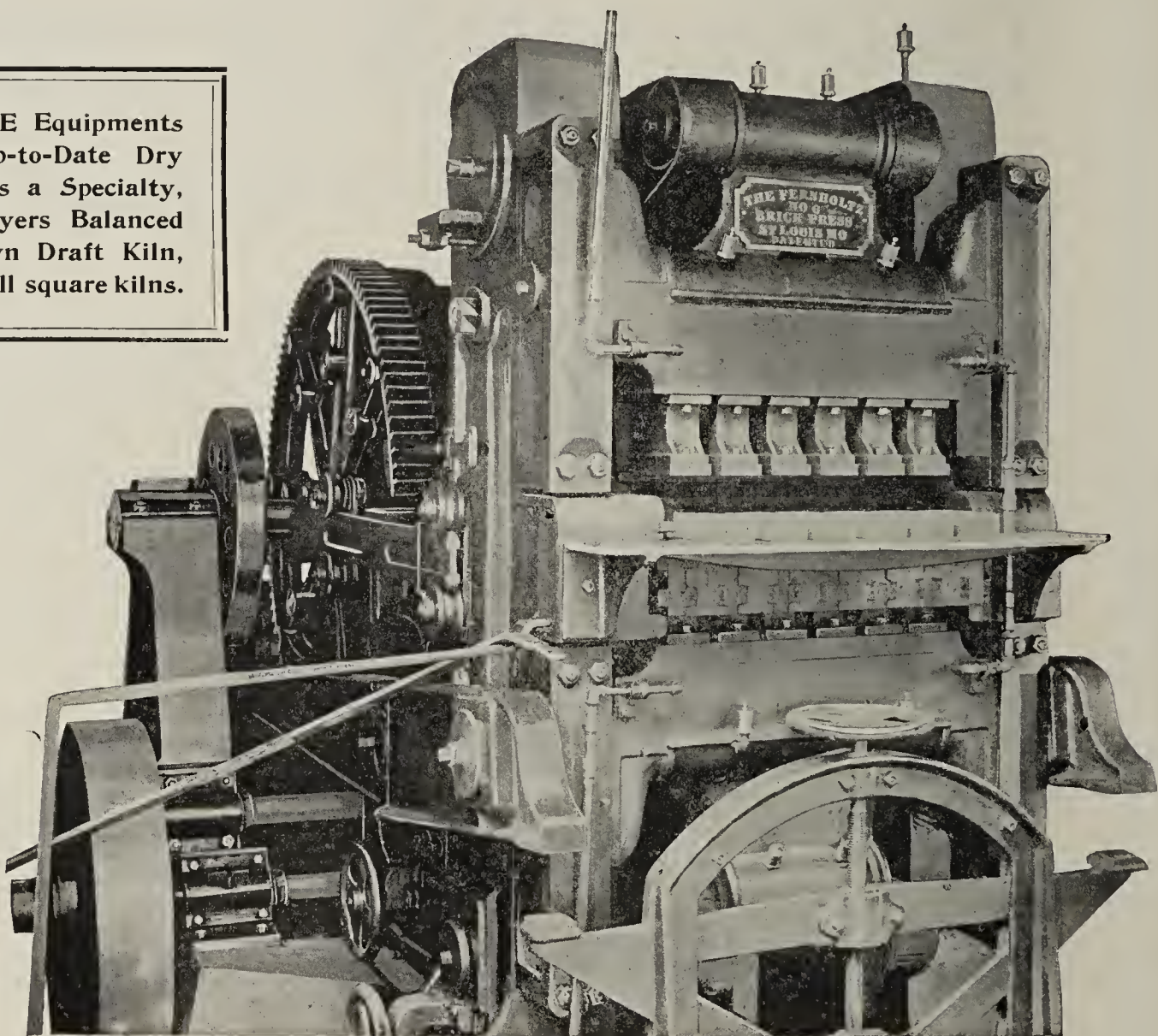
CHICAGO.

AGENTS FOR CANADA: WATEROUS ENGINE WORKS CO., Brantford, Ont.

The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMPLETE Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

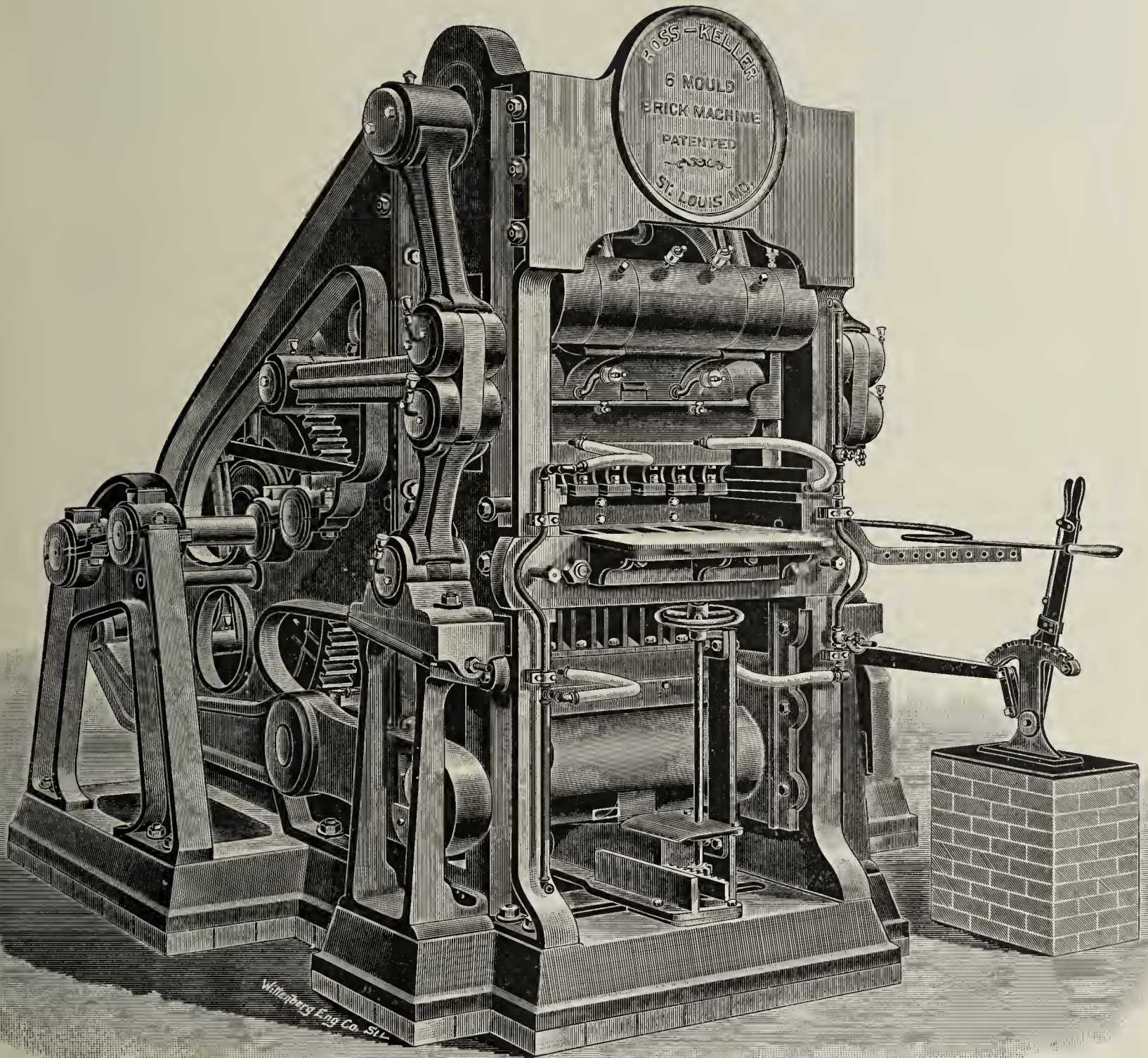
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

— BRICK SET IN KILN DIRECT FROM MACHINE. —



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

ST. LOUIS, MO., U. S. A.



The Price

Of a thing is generally fixed by its worth.
Swamp land is cheaper than a fertile farm.

Clothes made of shoddy cost less than
garments made of wool.

This is because they are worth less.

It is one of the eternal impossibilities of
the world to buy good things at the price
of bad things.

The STANDARD IMPROVED BRICK AND TILE DRIER

Is not a cheap Drier in the sense of being sold at a cheap price. It is, nevertheless, the cheapest Drier on the face of the earth. It costs a little more than some in the beginning, but the real economy of it shows in the end.

It is intended for Brick and Tilemakers who want a Drier that can be adapted to most any kind of clay. It does its work just as well in the North as in the South—in the East as well as in the West.

The method of drying is continuous. **The Standard Drier** works all the time. It never gets tired, and, if treated right, repairing days are very rare.

It is simple—there is no unnecessary mechanism or complications about it to hinder and annoy. Any man with common intelligence can operate it.

It does its work right. It is economical with steam. It will dry your ware just as rapidly as the nature of your clay will permit.

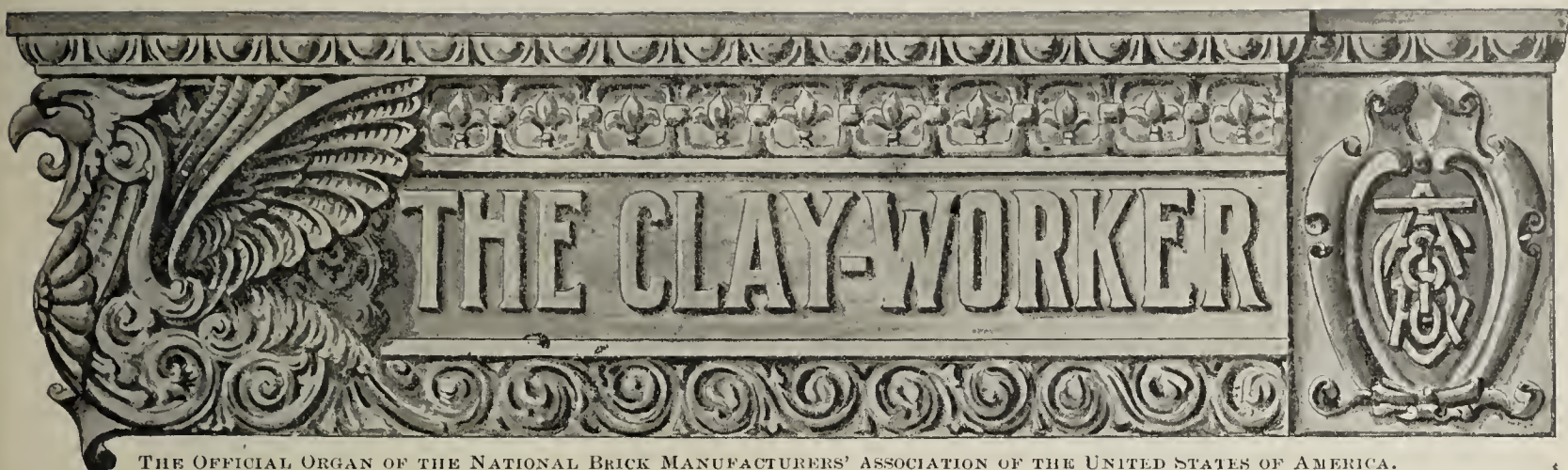
We have a 124 page catalog, full of descriptions, illustrations and testimonials from every section of the country. This book is rather expensive and we do not care to waste a single copy. We will however, be pleased to mail one to each reader of the CLAY-WORKER who is interested enough to ask for one.

....

The Standard Dry Kiln Co.,

186 South Meridian St.,

INDIANAPOLIS, IND.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVIII.

INDIANAPOLIS, IND., SEPTEMBER, 1897.

No. 3.

Written for the CLAY-WORKER.

AMERICAN ARCHITECTURE IN CLAY.

A Great Brick Structure Faced With Pavers.

THE BEAUTIFUL new building of the Chicago Home of the Friendless, situated on the corner of Vincennes avenue and Fifty-first street, was built by a few of Chicago's wealthy citizens for the shelter of its friendless. Well did the old home at 1926 Wabash avenue earn the right to its name. The old home was built in 1856. The good work has been carried forward by a little army of noble women, but the city has outgrown it, and now, through the efforts of these women, the beautiful new home is a fact, and ready to begin its history. The architecture is late English Gothic; one left to their own judgment would call it middle English, perhaps. When viewed from the right distance to appreciate in full its graceful proportions it is impossible to imagine a more perfect harmony of chimneys, turrets, battlemented towers and gabled roofs than this building presents pictured against the sky. There is not a single discord. The style of architecture makes one long for the day when Chicago, rebuilt—and Chicago is fast rebuilding—will wall its avenues, boulevards, drives and streets with homes and public buildings that will bring pleasure and peace to the eye.

It would be impossible inside the limits of a great city to find a location more suitable and delightful than the one cho-

sen for this home for those whom adverse fortune has denied a family roof tree.

The main entrance on Vincennes avenue, fronting towards the west; to the south Washington Park stretches away, with its trees, drives, tennis courts and ball grounds, where we are told the children are to be allowed to play.

Entering the building at the main entrance, the first thing that attracts the attention, perhaps, would be the generous fireplace, and over this, on a marble tablet, are the names of the men and women who built and supported the old home on Indiana avenue and the names of those whose generosity gave the land and built the new one.

The building is entirely constructed of the product of the clayworker's art, so far as its walls and roof covering are concerned. Mr. Charles S. Frost, architect, who designed the

building and superintended its construction, has made the most of the materials used with results that are very pleasing and that are a credit to him and a worthy contribution to the architectural art of the "city by the lake." The entire building, from the water table to the roof, is faced with paving brick (seconds) furnished from the works at Galesburg of which our genial friend, D. V. Purington, is the head. The belt courses, trimmings and copings are of terra cotta, of a slightly different shade of color from the brick, just enough difference in color to make a very pleas-



MAIN ENTRANCE TO THE HOME OF THE FRIENDLESS, CHICAGO.

ing contrast, the brick being of a dark reddish brown. Mr. W. D. Gates, of the American Terre Cotta Company,

furnished the terre cotta. By reference to the accompanying illustrations it will be seen that but little ornamentation has been placed on the terra cotta, thus carrying out the idea of solidity, expression and strong effect, which, I feel, Mr. Frost designed to effect, and in which he has certainly succeeded. The exterior ornamentation of the building is confined to the tower section of the elevation. The angel heads and wings about the main entrance to the building and in the arch above are very finely executed and are effective, and are fitting reminders of those guardians which it gives the beholder comfort to feel are hovering about and are ever watchful for the well-being of the orphaned ones dwelling there.

The shield of Chicago, supported by two lions (also in terra cotta), completes the ornamental features of the elevation.

The roof is of tile of red color, and, so far as the color is concerned, is very pleasing, and, viewed from a distance, the effect is good; from a closer point of view the effect of the roof would have been very much more artistic had a plain red clay



FRONT VIEW OF HOME FOR THE FRIENDLESS.

shingle tile been used, or a tile of a bold design, such as that known to the trade as Spanish.

The walls in the kitchens, pantries, store rooms and laundries, in the basement and on the first floor, as well as the stairways leading therefrom in the rear part of the building, are faced with impervious buff brick. The stairs are of iron, with slate treads, and the building, while not thoroughly fire-proof, is made slow burning by the use of metal lath, and suitable fire walls intersect the building in such a manner as not to permit the rapid spread of fire. The wings can be entirely cut off from the main building by steel shutters.

FAX.

"Opporchunities," said Uncle Eben, "is pretty sho' ter come to ebery man. But it's a mighty good idee, jes' the same. foh him ter hustle roun' an' send out a few invitations,"—Washington Star.

Written for the CLAY-WORKER.

ALBANY SLIP CLAY.

The Natural Clay and Modifications Which May be Made.



IN A CONSIDERATION of this rather remarkable natural glaze it may be well to look at its possibilities as well as its more common uses.

As its name implies, it is a natural clay found in the vicinity of Albany, N. Y. It is used largely as a glaze for drain pipe and stoneware, and is also used by many burners as a sort of pyrometer or test to indicate the degree of heat in a burning kiln. It is not accurate as a heat indicator, but is probably as accurate as anything else yet devised by man for this purpose. In the hands of a person thoroughly understanding it it will give results accurate enough

for all practical purposes, and possesses the advantage of indicating, to a great extent, the condition of the fires or kiln atmosphere. The very points, however, which make it desirable for this purpose would seem to point to its undesirability as a glaze material. If it shows differences in degrees of heat by changes in its color and general appearance, we would hardly expect to get a solid kiln of ware glazed with it, uniform throughout, or, if we did, it would be considered a remarkably evenly fired kiln. This is true of the raw material to a great extent, and it is further true that if the material is used in its natural state the temperature from which the best results are obtained must be fixed and cannot be altered to suit the requirements of the body. This would then limit the use of the natural slip clay to such bodies as will stand the requisite heat for its thorough fusion, and would limit its use in single fire operations to such bodies as require neither more nor less heat than is required by the slip clay.

To overcome this objection many have added materials to the slip clay to make it fuse at either a lower or higher temperature. This has been done by many, possibly, with marked success, but sometime ago Professor Orton stated that many had met with difficulty in softening Albany slip clay, stating that the trouble met with was an inability to soften and at the same time retain the rich brown color and velvety luster of the original clay. I was led, through interest in the subject, to investigate it pretty thoroughly, and tried to determine by means of a large number of experiments how it might be softened and the largest amount of its good qualities retained, and I was further led into a series of experiments to see what modifications of color could be produced. The result of these experiments I now purpose making public, not that they are very conclusive or particularly valuable, but in the hope that they may throw some slight light upon the matter which will be of assistance to brother craftsmen.

Before entering upon the subject it may be well to look at the chemical composition of Albany slip clay and to consider its chemical peculiarities. It is an extremely tough and sticky clay of the following composition, as given by Professor Orton:

Silica combined	17.02
Silica free	38.58
Alumina	14.80
Water combined	5.18
Phosphoric acid	.15
Oxide of iron	5.85
Oxide of manganese	.14
Lime	5.70
Magnesia	2.48
Potash	3.23
Soda	1.07
Moisture and carbonic acid	4.94

99.14

This analysis does not present any very peculiar points, except that it is slightly high in alumina, but, as already pointed

out in "Clay Glazes and Enamels," an attempt at synthesis strongly accentuates this peculiarity. The above chemical combination can be obtained, or very closely approximated, by the following mixture:

National China clay.....	27.05
Brandywine Summit feldspar.....	19.39
Ground flint	32.41
Phosphate of lime.....	.33
Carbonate of lime.....	9.85
Oxide of iron.....	5.85
Oxide of manganese.....	.14
Soda	1.07
Magnesia	2.48
Moisture	.61

99.18

The above mixture would never suggest itself as a good glaze mixture, nor will it fuse at the same heat as Albany slip clay, nor will it fuse without blistering.

In other particulars the artificial mixture above differs from

Moisture and carbonic acid.....	4.94
Phosphoric acid	.15
	99.14

Note particularly the proportions of the alkaline earths, the alkalis and the coloring oxides. We have here an alkaline glaze of the porcelain type, with an excess of lime and a large percentage of iron as an intermediary. The alkalis are fluxes throughout the scale of temperature, whereas the alkaline earths only exert their full effect at high temperatures. Iron is the principal coloring agent. The alkaline earths are antipathetic to the coloring properties of iron, when they act as fluxes, but are inert or indifferent at low heats, where they do not act as fluxes.

It is hardly a surprise, then, to see a resulting glaze of rich color and velvety luster at a moderate heat, and a gradual brightening of luster and evidences of greater fluidity of glaze, combined with a loss of richness in coloring, as the heat ad-



GENERAL VIEW OF HOME FOR THE FRIENDLESS, CHICAGO.

the natural clay. It is not nearly so plastic, no matter how finely ground, nor does it shrink so much in drying, but it differs most in not being nearly so strong when dry.

This is not supposed to be, in any sense, a scientific article, yet some slight consideration of the cause of the peculiar action of Albany slip clay, when under fire, will probably be wise and proper at this point. A rearrangement of the analysis will probably be useful in view of such consideration. We will combine the coloring matter, iron and manganese, also the alkaline earths, lime and magnesia, and the alkalis, potash and soda, and state the analysis, as follows:

Silica	55.60
Alumina	14.80
Coloring oxides	5.99
Alkaline earths	8.18
Alkalis	4.30
Combined water	5.18

vances, until, at an extremely high heat, the resultant glaze is of extremely high luster, but of a dirty greenish gray color, and shows evidences of extreme fluidity, having run from the high points and collected in drops on the lower portions of the trials. These changes are the burner's guide. The burner must not rely upon these changes without using his own judgment, however. He must remember that rapidly increasing heat produces augmented action on the part of the fluxes, and heat increasing at a rate below the normal, the reverse. He must also bear in mind that a soft coal or any flamy fire is apt to flash trials, and must make the proper allowance. This must be done with any trial, whether shrinkage trial or Seger cone.

How can we soften Albany slip clay and retain its richness of color?

If we merely soften by using lead, a transparent and prob-

ably greenish colored glaze will result, and some difficulty may be met with from blistering. An addition of alkali alone will yield no better result. Alkali, combined with silica and coloring matter, will give good results, but insoluble alkaline fluxes of sufficient fluxing power are to be obtained only by fritting, and, as this is an expense and nuisance, I have found lead to be the best form of flux to be used, but it must be so combined with other materials as to prevent the evil effects of the lead alone.

Albany slip clay will approximate very closely to the following chemical formula: $1.0 \text{ RO}, 0.7 \text{ R}_2\text{O}_3, 4.0 \text{ SiO}_2$.

We here have an extreme amount of the R_2O_3 elements in proportion to the SiO_2 , even for an alkaline glaze, and an addition of lead alone does not alter this proportion, but makes it more dangerous, from the fact that lead glazes will not stand so large a proportion of the R_2O_3 elements as will the alkaline glazes. To overcome this difficulty it is, therefore, advisable to add silica as well as lead.

A slight percentage of oxide of zinc tends to prevent the transparent or thin and washed-out appearance produced by lead alone. Zinc and iron combine to form an opaque glaze, but if the zinc be added in too large a quantity the color obtained will be on the order of the claret or light browns, instead of the deep Albany slip brown; besides, a large addition of zinc to an iron-lead glaze produces a rough and poorly combined glaze, with a tendency to blister or present an egg-shell appearance, also sometimes to show different degrees of luster at different points; therefore, the addition of zinc should be made with great caution and its effects well noted under the existent conditions of burning.

Silica being white and zinc and lead nearly or quite colorless, the additions suggested above will lighten the original slip clay considerably; besides this, there will be a further lightening due to the strong fluxing action of the lead and its tendency to form, with iron, a yellowish glaze. It will therefore be found necessary to add coloring material. Fair results may be obtained by the addition of iron alone, but I have obtained the best results by using chromium and manganese in combination with iron. Chromium, combined with iron, makes our most reliable browns. The chromium seems to take from the iron its tendency to run into the greenish or yellowish tints. The best form in which to introduce the chromium is as chromate of lead; that is, this is the best form from which to obtain color effect, but unfortunately a large addition of this material produces a great tendency to blister. I have found it advisable, therefore, to introduce only a portion of the chromium in the form of the chromate of lead, and the balance in the form of finely ground native chromate of iron.

A recipe for a moderately low heat glaze formed on the above lines would, then, be somewhat as follows, variations being made to suit different conditions:

Albany slip clay.....	63.3	to	70.00
White lead	25.3	to	17.4
Flint	6.3	to	7.00
Oxide of iron.....	0.72	to	0.79
Oxide of manganese.....	0.56	to	0.61
Chromate of lead.....	1.27	to	1.4
Chromate of iron.....	0.67	to	0.73
Oxide of zinc.....	1.88	to	2.07
	100.00		100.00

The cost of such a glaze may be an objection to some, but, in that case, the use of lead to any extent would be open to the same objection. The chromate of lead is the most expensive material, and the chemist may possibly suggest that a substitution of equivalent amounts of lead and chromium in other forms will answer the same purpose. Theoretically it may, but practically it does not.

Some very fine colors can be produced in glazes composed principally of Albany slip clay. These are in different shades of brown, olive greens, cherries and black.

The base upon which to work for these shades is composed of about 70 per cent. Albany slip and 30 per cent. of A, or trans-

parent glaze, page 81, "Clay Glazes and Enamels." This base may be changed in tint by the addition of various percentages of different metallic oxides.

Oxide of iron added in varying quantities will produce shades of orange brown, running to a good cherry red.

Oxide of cobalt, or stain made from oxide of cobalt, added, will produce shades of olive green and blue green.

Oxide of manganese added in varying quantities will produce shades from orange brown to dark brown.

Oxide of copper added will produce a peculiar greenish brown.

Oxide of iron and oxide of cobalt both added, the latter in rather large amount, will produce a very good black.

Many of these shades are very rich and beautiful, and possess the advantage of not being apt to craze. An investigation of these Albany slip colors will certainly repay any one who is interested in this line of work, and I have no doubt beautiful results will be obtained.

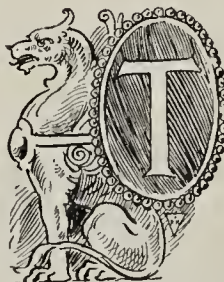
H. R. GRIFFEN.

Written for the CLAY-WORKER.

THE CLAYWORKING INDUSTRIES OF VICTORIA, AUSTRALIA. No. 6.

BY F. A. CAMPBELL, C. E.

—The Clifton Brick Works.—



THESE WORKS ARE SITUATED at South Preston, about two miles further out from town than the Northcote works, previously described. They were established by David Clifton in 1890. On his death they were carried on for a time by his executors, and are now leased to Mr. E. Richardson, who manages the business department, having Mr. J. L. Laidlaw in charge of the works.

The clay deposit on the property is similar to that at the Hoffman and the Northcote works. The methods of manufacture adopted are also the same; that is, a red building brick is made by the dry press system and burnt in Hoffmann kilns. The pit, which is partly shown in Fig. No. 3, is now 125 feet deep, and the clay is found to improve in quality with the depth. It is raised to the crushing mill by a



FIG. 1. Filling and Emptying the Hoffman Kiln, Clifton Brick Works.

wire rope tramway. Bradley & Craven's roller mills are used to crush the material, which is then fed into the presses. Of these there are three, single-mold, of the Bradley & Craven type. The Hoffmann kiln is in all respects similar to those already described.

The brick turned out are of good quality, hard and fairly uniform in color, and the output at present is about 20,000 per

day. The manager states that the demand is good, and he anticipates a rise will soon occur in prices. At present only from \$3.50 to \$4.50 per thousand is obtained.

In addition to the ordinary building brick, special brick are made, both red and white. These are all hand-made and hand-pressed. The clay for the white brick is taken from a pit about half a mile away. After being ground in the dry pan crusher, it is mixed by hand with water and molded by hand to the required form. The green brick then stand for a few days in the drying shed, when they are pressed in a hand press and stacked again, so as to get bone dry; they are, after that, burnt in the ordinary way in the Hoffmann kiln.

The price obtained for the hand-made special brick is \$20 per thousand. There are at the present time thirty-two men employed, in all, and eight drays. The bulk of the brick are sent by rail, a siding connected with the Preston line coming into the yard. Fig. 1 shows the burnt brick being run out of the kiln to the railway trucks in hand barrows and the green brick on their way to the kiln in the small tram cars. The figure on the plank road above was that of a man engaged in wheeling coal up to the feeding floor of the kiln, until the appearance of the camera caused him to pose for the purpose of being "taken."

The power for working the presses and other machinery is supplied by a 100-horse-power Otis engine, and the appearance of the whole of the plant and premises generally indicate both economical and efficient management.

—A New Branch of Work.—

The Melbourne city sewerage works are keeping our clay-working friends busy at present. In addition to the eight hundred miles of glazed earthenware pipes and the large quantities of brick for the main sewers, 120,000 closet basins are required.

The manufacture of these articles has introduced a new department into many of the factories. As with the pipes, and, in fact, all the work required by the Sewerage Board, the standard for these basins is a high one. But few of the yards had previously any experience in turning out this class of ware, but nevertheless a good many have embarked upon it, and, with some experimenting and unavoidable loss at the outset, are now turning out first-class articles.

The basins are specified to be of such a form as will be cleansed in every part by one discharge of a cistern containing three gallons of water, discharging through a pipe of one and

the trap to have a seal of $2\frac{1}{2}$ inches; the outlet from trap to be four inches diameter, clear; the basin to be so formed that it does not become fouled by soil dropping on back, and to contain a sufficient quantity of water to prevent it being fouled in



FIG. 3. Clay Pit and Buildings, Clifton Brick Works.

use; the inlet from the cistern to be capable of receiving and being jointed to a $1\frac{1}{2}$ -inch 8-pound lead pipe; all outlets to fit the socket, to be of standard 4-inch drain pipe. Of these basins there are, in all, seven classes, varying in quality and price as follows, the prices quoted being those at which they are supplied to the board:

CLASS.	DESCRIPTION.	TRAP.	No.	RATE EACH.
1	Strong Vitrified Stoneware or Fireclay, $\frac{3}{8}$ inch thick, basin and trap in separate pieces, brown glazed outside and white glazed inside	P S $\frac{1}{2}$ S	1,000 500 500	\$1.65
2	Strong Vitrified Stoneware or Fireclay, $\frac{3}{8}$ inch thick, basin and trap in separate pieces, white glazed both inside and outside	P S $\frac{1}{2}$ S	500 250 250	\$2.20
3	Strong Vitrified Stoneware or Fireclay, $\frac{3}{8}$ inch thick, basin and trap in one piece, brown glazed outside and white glazed inside	P S $\frac{1}{2}$ S	250 125 125	\$5.00
4	Extra-strong Vitrified Stoneware or Fireclay, $\frac{1}{2}$ inch thick, basin and trap in one piece, brown glaze outside and white inside	P S $\frac{1}{2}$ S	130 60 60	\$5.00
5	Extra-strong Vitrified Stoneware or Fireclay, $\frac{1}{2}$ inch thick, basin and trap in one piece, white glazed both inside and outside	P S $\frac{1}{2}$ S	60 30 30	\$7.50

The fact that our local manufacturers should have been able to meet the demand for this new and special line so satisfactorily speaks highly for their skill and enterprise. The photo sent herewith shows the process of manufacture at Cornwell's Pottery, the methods employed being generally the same at the various works now doing this class of business.

SUCCESSFUL ADVERTISING.

The amount of cash received direct from an advertisement in any periodical is no fair criterion of the medium's value. If it brings a reasonable number of substantial inquiries that, after further cultivation by letter or personal visit, result in sales, it is successful. Advertising in periodicals has done sufficient, ordinarily, when it sifts out from the great public the people who are interested somewhat in the advertiser's goods.

—Exchange.

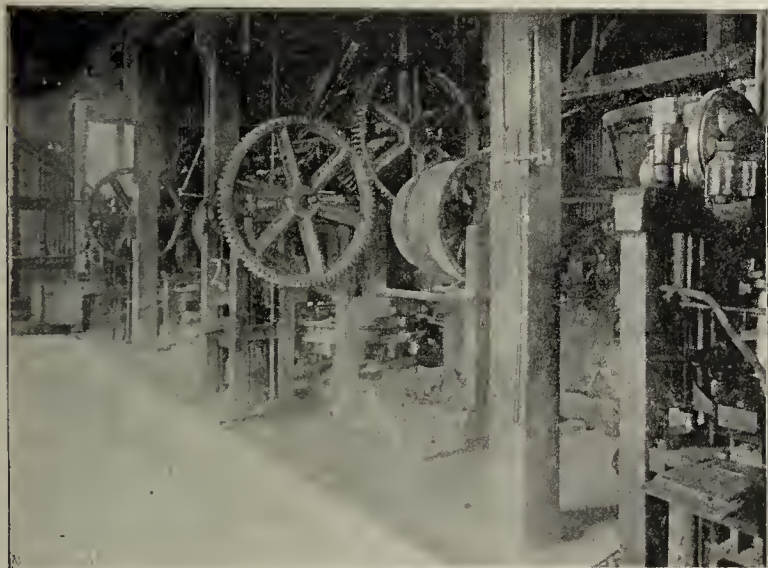


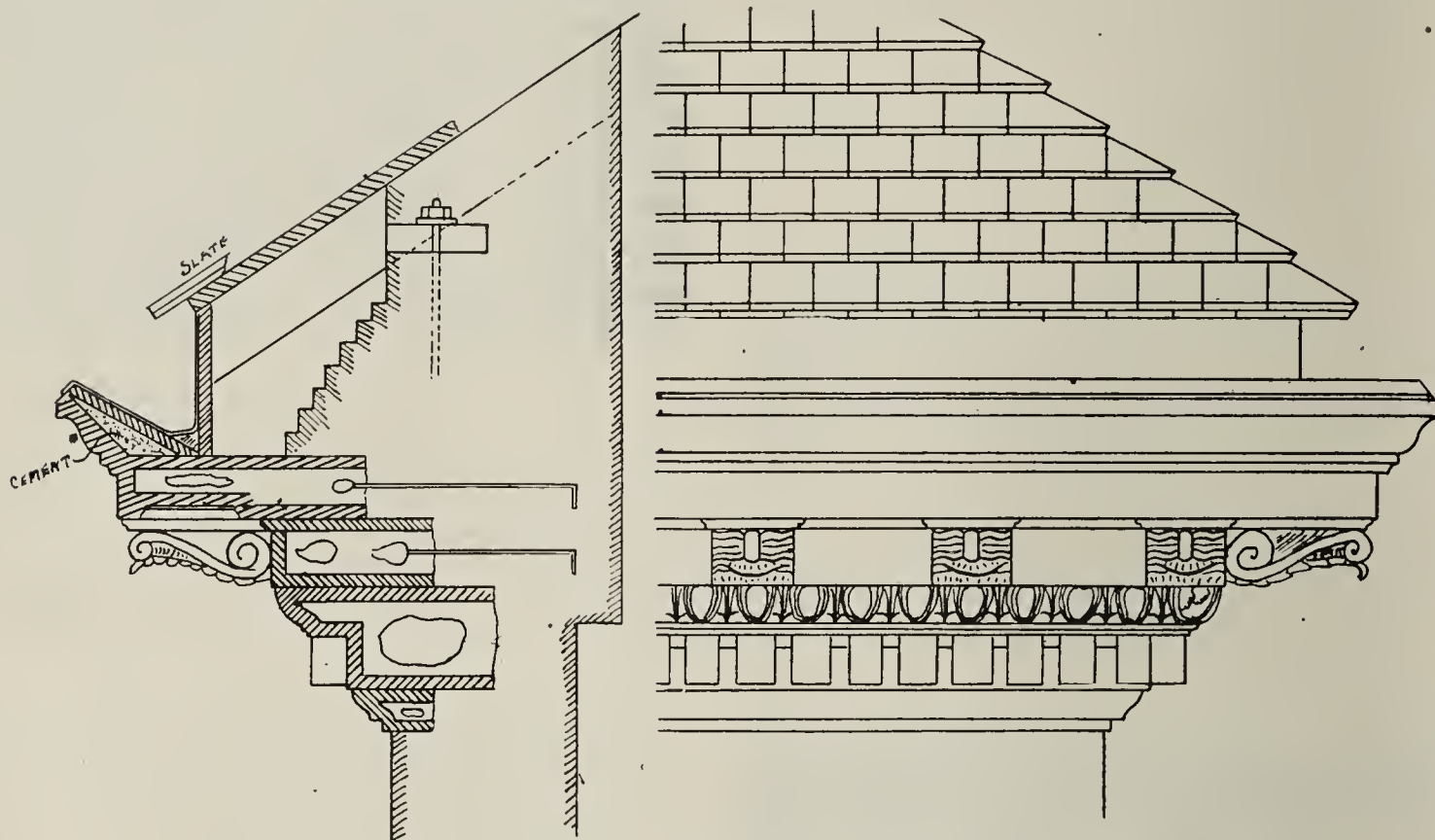
FIG. 2. Bradley and Cravens Presses, Clifton Brick Works.

a half inches diameter. The surface of the water in the cistern is to be five feet above the center of the inlet for the flushing water in the pan; the height of the basin and the trap, when set up, to be $16\frac{1}{2}$ inches; diameter of basin, $15\frac{3}{4}$ inches by $14\frac{1}{2}$ inches outside rim, and $.13$ inches by $11\frac{1}{2}$ inches inside rim;

TILE, BRICK AND TERRA COTTA AT THE UNIVERSITY OF ILLINOIS.

THE ILLINOIS State University, at Champaign, has built quite a number of fine buildings during the last few years, and, with one or two exceptions, they have been of brick. The soils of Indiana and Illinois are represented in these buildings. Our new Library Hall, now in course of erection, is built of Chicago brick, stone veneered, and is roofed with tile furnished by a Chicago firm. The tile gives the roof a very much warmer and more finished effect than could have been obtained with any other material.

The Engineering Building, erected in 1894, at a cost of \$160,000, is faced with rich buff colored brick, using the stretcher bond brick for binding the facing to the wall. Terra cotta window sills are used, and the walls, I believe, are surmounted by the most pleasing terra cotta cornice it was ever my good fortune to see. One can scarcely realize, as he looks up at it on a sunshiny day, that it was once the mud that an Illinois farmer kicked from his shoes before going in to supper. It is pure



DETAILS OF TERRA COTTA CORNICE OF ENGINEERING BUILDING, Illinois State University.

Corinthian in style, with finely molded medallions, and every molding truing up in a way to rival the most carefully carved stone work. I have endeavored in the accompanying sketch to give you some idea of the general appearance of this cornice.

A STUDENT.

BUTTON-HOLE TALKS.

REALLY, I MIGHT just as well surrender at once, and acknowledge that I am absolutely the victim of the button-holer. Why I shriek out about this now is because the ranks of the button-holers are so much larger than I have had any idea. Honestly, though, understand, I do not wish these ranks thinner or their efforts reduced, nor do I wish the button-holers changed. The last illustration of this happened thus:

I had come up from the factory when the whistle blew at night and had thrown myself down on the sofa by a window for a rest. My little five-year-old spied me, and came bounding along, and, climbing on me, shouted, "Now play!"

"No," I said, "papa is too tired to play."

"Well, then," said her Highness, "tell me a story."

"No," I said, firmly, "people mustn't tell stories. Don't you know how naughty it is to tell stories?"

"Oh," said she, "not wrong stories, but dесс stories, you know, 'bout when you was a boy."

"No," I said, "that's too long ago to remember, and I have told it all to you many times in the past; but you, Miss Bright Eyes," said I, "you tell me a story yourself."

"All right," said she, and after a moment's reflection she began: "Once upon a time there was an old piggy who sent her three little piggies out to take care of themselves.

"First little piggy met a man with a bundle of straw and said: 'Please give me that straw to build me a house.' Man gave him the straw and he built himself a house with it. 'Long came old wolf and knocked at the door, saying, 'Little piggy, little piggy, let me come in.' Said piggy: 'No, by the hair of my Chinney-Chin-Chin.' Old wolf got cross and said: 'Then I'll huff and I'll puff, and I'll blow your house in.' So he huffed and he puffed, and he blew the house in, and ate the poor little piggy all up.

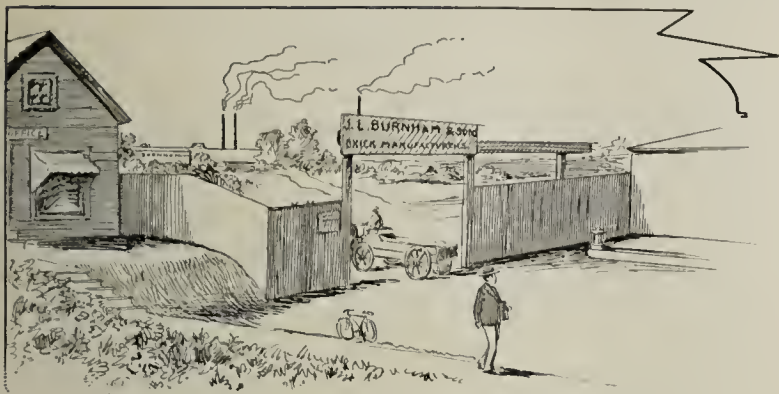
"Next little piggy met a man with some wood, and asked for

the wood and built himself a house with it. Old wolf came along and said: 'Little pig, little pig, let me come in.' 'No, by the hair of my Chinney-Chin-Chin.' Said old wolf: 'Then I'll huff and I'll puff, and I'll blow your house in.' So he huffed and he puffed, and he blew the house in, and he ate that little piggy all up, too.

"The other little piggy met a man with a load of bricks," continued little blue eyes, at which I suddenly began to take additional interest in the story. She continued: "He asked for the bricks and the man gave him the bricks" (quite the natural thing, you notice; no combinations, or trusts, or excessive prices, but the regular programme; the buyer names the price, and we do the rest). "Piggy built him a house with the bricks, and then old wolf came along, saying: 'Little pig, little pig, let me come in.' 'No, by the hair of my Chinney-Chin-Chin.' 'Then I'll huff and I'll puff, and I'll blow your house in.' So he huffed and he puffed, and he puffed and he huffed, but he couldn't blow the house in, 'cause it was a brick house, and wasn't the kind of house that blows in, so he couldn't eat that piggy up at all. Now, isn't that a nice story?" concluded my entertainer.

"Yes," I said, as I kissed and hugged her again. "That is a very nice story, and told by a very nice girl, and a true daughter of a clay enthusiast. It's no wonder that it's a great business and that we are enthusiasts when even Mother Goose and cherubs like you come to our defense and preach the superiority of our material for the safe structure of homes."

GATES.



CREAM COLORED BRICK—HOW THEY ARE MADE IN MILWAUKEE.

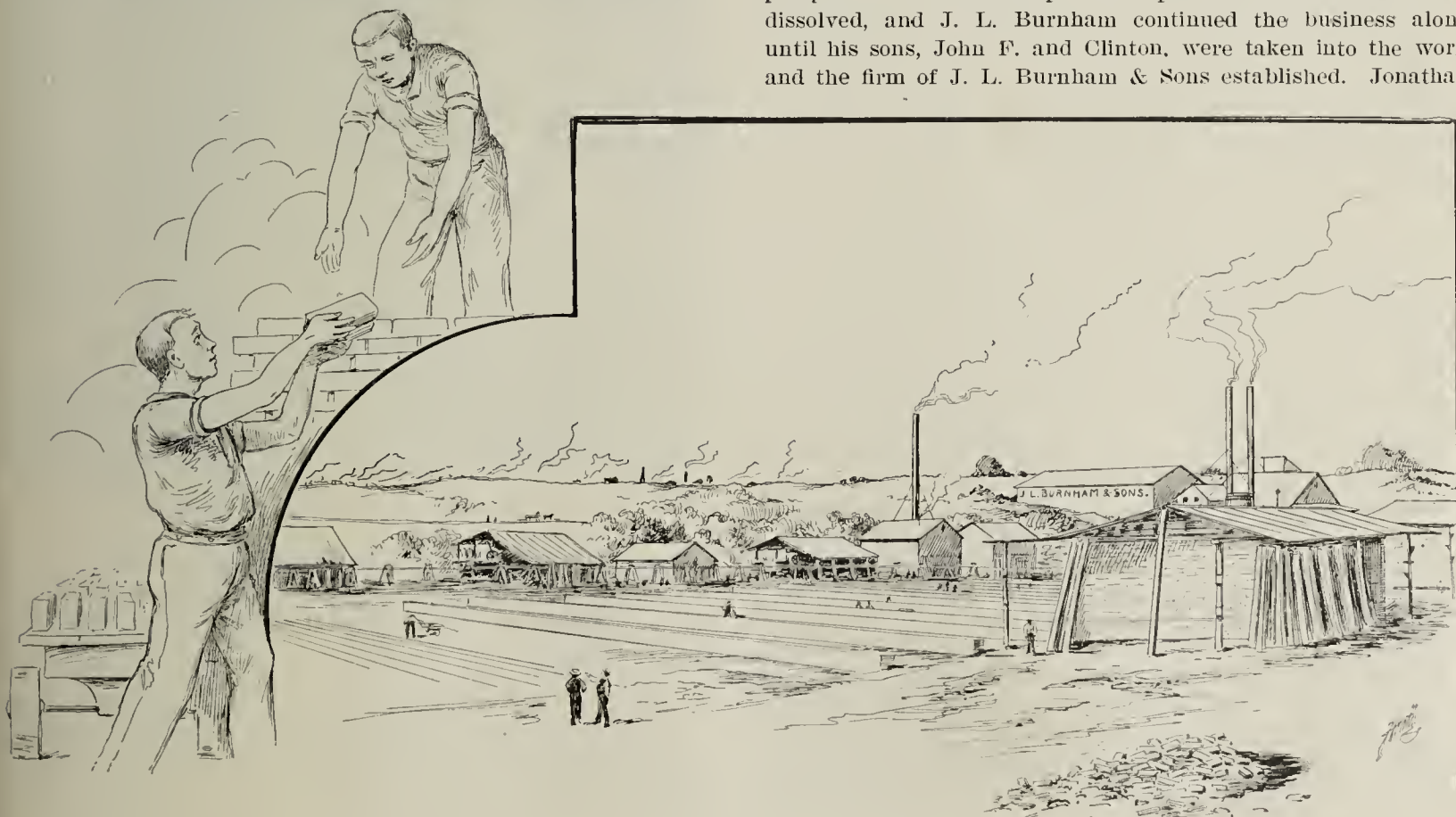
IT IS DOUBTFUL if many Milwaukeeans, much less outsiders, know that the cream colored brick that gave the city the name of the Cream City are no longer made here or anywhere else. The present product looks creamy, it is true, but old settlers aver that it does not present the peculiar yellowness that made the earlier output famous the country over. It appears that the cream brick were made from a limited pocket of clay on the north side of the Menominee valley, that divides the city from east to west, and that when this pocket was exhausted all efforts to find another like it failed signally. That the present Milwaukee brick is a fine production and well worthy of its celebrity is past denying, but to the old settlers, at least, it is not the original article, and they shake their heads.

Milwaukee brick is durable, as many examples go to demonstrate. No better one than that furnished by what is known as the old Hull residence need be pointed out. It was the first brick dwelling erected in the city, and it was built of Milwaukee brick in the year 1842, while Milwaukee was the merest village. Just now it has fallen into disrepute, having been the scene of a murder of an old woman for her money, followed by a brief conflagration, set to hide the crime. Nor shame nor fire could take from the brick of which it is composed its symmetry and strength, and it is probable that the building will live many a day yet to demonstrate the superiority of the material of which it is composed. All this may not be exactly pertinent to

the task I have set myself—of picturing to your readers the yards of J. L. Burnham & Sons, but it is interesting nevertheless. I might say, however, that the Milwaukee brick have been famous all the years that they have been produced, and that as long ago as 1879 a million and a half were sent out of town, while for years before that date many thousands were annually sent abroad. After the Chicago fire a large part of the new buildings erected in that city were built of it.

My visits to the Burnham yards the present week were scarcely well timed, as Milwaukee is just now in the throes of a price-cutting war among the brick men, and the Burnhams have taken advantage of it to close down for the purpose of making some needed repairs and alterations. Nor was Mr. John Burnham on hand, for a special session of the State Legislature, of which he is a member, called him to Madison for an indefinite period. The Burnham yard is located on the south side of the Menominee valley, right in the midst of bluffs of inexhaustible clay. The owners of the yard figure that twenty years will not exhaust the banks within their immediate boundaries. The clay is of fine quality, save for a trace occasionally of quicksand, and, when burned, takes on much of the peculiarities of the old yellow brick. They have thirty acres, and their location gives them unexcelled shipping facilities, the Menominee valley being a network of tracks, and water communication being afforded by reason of the Burnham canal, built in an early day by the late Jonathan Burnham, the founder of the business now carried on by his sons.

The yard of J. L. Burnham & Sons is an old-timer. Jonathan L. Burnham came to Milwaukee from New York State in 1843. The year following he formed a partnership with his brother, George Burnham, and began the manufacture of brick. In 1848 he purchased the site on which the business is now conducted by his sons, and the two brothers carried on a successful brick business for years. At that time brick machinery was unknown. The clay was tempered by turning a large wheel in a circular pit by horse-power and the brick were molded by hand. With the assistance of a man named Martin the Burnhams contrived a machine for grinding, tempering and molding the clay—the first brickmaking machine made in America, they claim. Of course, the machine made brick much cheaper than by the old method, and, besides, the machines sold netted nearly \$1,000 to the Burnham brothers, so they became very prosperous. In 1856 the partnership between the brothers was dissolved, and J. L. Burnham continued the business alone until his sons, John F. and Clinton, were taken into the work and the firm of J. L. Burnham & Sons established. Jonathan



Burnham was a man of good business judgment, and lived an active life. He had the respect and confidence of his fellow-townsmen, as is attested by many a reminiscence among the old settlers. He was a lover of horses, and toward the close of his life became quite noted among turfmen. This quality has



JOHN L. BURNHAM, Milwaukee.

evidently been inherited by his son, John L., who is a leader among the lovers of driving horses of the State.

When I called at the Burnham yards on Monday the cashier, William Bareman, was the only man in the office. The yard, he said, was practically deserted, whereas, when things were driving at their normal pace, 125 men gave a liveliness to the scene. However, I was at liberty to inspect the works, and he would be most happy to answer questions. He pointed out the great bluffs of clay that lay between the office and the yard proper, saying that it represented the raw material. It was a fine clay, he said, and almost too pure; in fact, it contained "almost too much fat." In various other respects it differed from the other Milwaukee clays. Putting on his coat, he led me out to the yard. The Burnham yard has a Big Wonder stiff clay machine in operation, the only one in the city. I had heard that there had been more or less trouble over the machine, and I was anxious to learn the truth. On the way out to the yard from the office I asked the cashier about it, and he replied:

"Yes, we have a Big Wonder, and it is now working so well that we shall, in time, probably use nothing else. It's a fine machine, and no mistake. It makes a fine brick and a cheap one, when its capacity is considered."

When we reached the building where the engine and the stiff clay machine are both located I was introduced to the engineer, George G. Glass, who was to show me about the yard. Mr. Glass was for years a machinist and millwright, and what he doesn't know about machinery is not worth knowing. He came to the Burnham yard last Christmas. He is enthusiastic over machinery, and has a pardonable pride in his power of subjugating balky machines. He would rather work out a knotty case of mechanical insubordination than eat a square meal. It is, therefore, his particular pride that the Big Wonder machine has worked to perfection since he came to the yards.

"Like everything else," he said, "the stiff clay machine works like a charm when well handled. I can't see the least objection to it, and the fact that it does double the work of other machines, and at the same cost, makes it worth its weight in gold. When I came here I found that the machine had not been properly set up, and I set to work to put it right. After that there was no more trouble with it. The Cunningham cut-off, that is part of the machine, is a fine piece of mechanism, too, but it must be run by some one who knows machinery. I had quite a time till I got the hang of it, but now I can almost adjust it with my eyes shut, and it does me good to see it work.

Come with me and I will show you the machine."

We passed through the engine room into the western half of the building, where the stiff clay machinery is located. My guide led me up a flight of stairs to the second story, which is on a level with one of the clay bluffs, and across which a road runs to enable teams to bring the clay and dump it into a granulator, which acts as a clod breaker and conveyor, and delivers the clay into a combined four-roll crusher and stone separator, which sets immediately under the discharge end of the granulator. The upper rolls remove the stones from the clay and the lower rolls crush the finer stones. This can be seen better on the ground floor, and thither we retraced our steps. The accompanying photo shows the Wallace combined four-roll crusher, and also inclined belt conveyor that carries the ground clay up to the pug mill, located on the second floor. Further on in the building a spray of water plays down into the pug mill, and the clay then goes to the Big Wonder machine underneath as stiff mud. All of this machinery, including the granulator, pug mill, elevator and four-roll crusher, are from the factory of the Wallace Manufacturing Company, Frankfort, Ind., the same firm which manufactures the Big Wonder. Some idea of the size and shape of the Big Wonder machine may be had from the illustration. Once in the Big Wonder machine proper, a vertical screw crowds the mud downward and a horizontal screw feeds it forward. By this arrangement of the augers, Mr. Glass claims, the clay is not unduly twisted. The clay is then forced out of oblong openings and fed on to the traveling belt, that carries the rectangular strips of moist mud to the wire cutters of the Cunningham automatic cut-off machine. The capacity of the Big Wonder at the Burnham yards is 75,000 per day. Clearly, in the language of the street, "there are no flies" on the Big Wonder. Besides the Big Wonder, the Burnhams operate five soft mud machines, the two which run at a time having a capacity of 70,000 a day.

Another interesting feature of the yard, and a money maker, too, is a dry press equipment for the production of fine pressed and ornamental brick. It consists of an immense four-mold Simpson press, which turns out 20,000 or more pressed brick a day, of a character very hard to beat, and the usual ac-



The Four Roll Crusher and Stone Separator.

companionment of clay pulverizers, elevators, screens, etc., furnished by the Simpson Brick Press Company, Chicago, Ill. All in all, the Burnham yard is quite prepared to make brick while the sun shines.

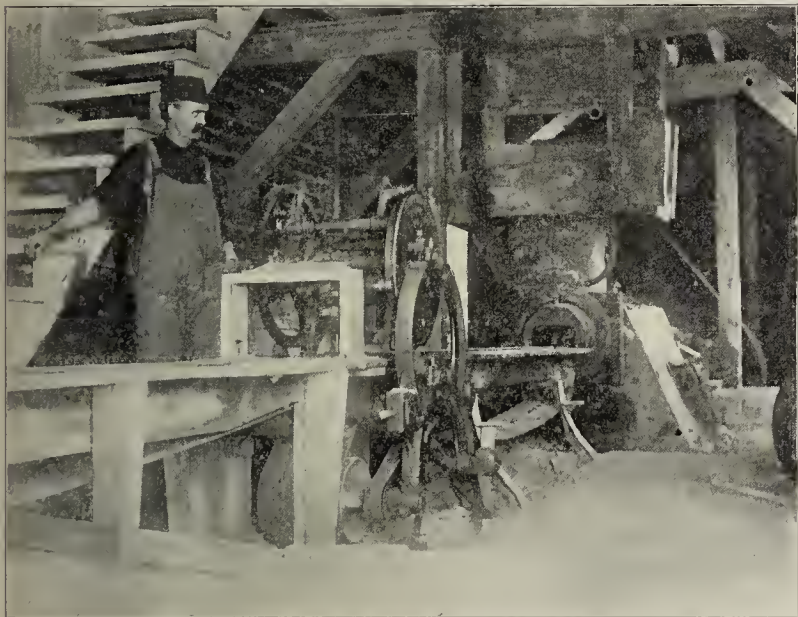
What you pay is not half so important as what you get in advertising. The cheap medium is nearly always much more expensive than the high priced medium when results are considered.—Ex.

Written for the CLAY-WORKER.

BRICKMAKING IN MAINE.

THE HISTORY of brickmaking for the past seventy-five years in this section is probably characterized by fewer changes than that of almost any other business. From the round "tread" or pit, with a man standing on a block in the center, forcing, with a long goad and voluble profanity, a yoke of oxen to circle around him, up to their knees in mud, to the semi-circular pit, with a horse attached to a sweep, traveling around outside of it, mixing mud by a rotating shaft filled with wooden pegs, in an upright box some four feet square, was no great stride in the direction of improvement in production, and none at all in quality. Add to this a carriage on which to place the molds, a follower to press the mud into them and a treadle for the operator to jump on to bring the follower down, and you have substantially all the improvements that seventy-five or a hundred years have developed in the business. With this machine, which anybody can make at an expense of thirty or forty dollars, three men will lay out on the yard from eight to ten thousand bricks in a forenoon. That means one man to put the mud into the machine and keep the yard in order and two to make the bricks. In the afternoon the same men will get in the clay for the next day's work, hack up the bricks struck the day before, and set some in the kiln if there is time. There is usually plenty of dull, wet weather to set in the kiln the bricks which have accumulated during the favorable striking days. This is the regular routine in all brickyards, big and small, in this part of the country. The extreme simplicity of the operation, the little capital or experience required, the superiority of the production and the favorable conditions for operating small yards in almost every section of the State render the operation of any of the great, expensive machines impracticable; and experience has demonstrated that they cannot compete, either in quantity or quality of production, with the old methods herein outlined.

Two or three years ago one of our largest brickmakers thought of putting some kind of modern machine in one of his



The Big Wonder and Cunningham's Automatic Cut-off.

yards, and, with that end in view, went on an extended tour of inspection through the West and South, visiting many of the best equipped and so-called "model" yards. In no one instance did his investigation show results equal to what his own methods were producing, not one of them turning out as many bricks per man as he was doing in his own yards.

I don't wish to be understood as trying to demonstrate that our methods are best for all localities, and hope not to give the impression that my notions are those of a superannuated

old fogey. I am simply illustrating what experience has demonstrated to be the methods best suited to our conditions.

There are clays in different sections of New England, and even within a few miles of where I am writing, which cannot be worked by this process at all. They must either be struck in a stiff mud sand machine or by hand precisely as they were



Milwaukee's First Brick Structure.

a century ago. Sand struck bricks are objected to where color is a consideration, and if there is much quicksand in the clay it won't slip out of the molds or stand up if struck as soft as it has to be in our machines. This difference in clays I saw conspicuously illustrated in a yard in Massachusetts. There was a steam machine making forty thousand sand struck bricks per day, with the pallet system. In the same yard were five of the oldest style of pug mills, mixing mud by horse-power for five men to fill the molds by hand, which were being carried away and spread on the yard one mold at a time, the peculiarity of the clay not even permitting the use of offbearing trucks. There was so much quicksand in the clay as to render it unfit for making bricks by any other method. These latter were made for repressing and common face work, where color was one of the requirements.

The only improvement in our brickmaking has been in the quality of the small tools and in the science of burning, for burning has become a science, and getting a good burn is no longer considered a matter of pure luck. Indeed, when it is remembered how kilns were managed fifty years ago and the slovenly way in which they were constructed, the wonder is that they were ever burned at all. The boss burner of those days was a character, and belonged to a class which has now become extinct. In most cases he was an old brickmaker who had become a superannuated philosopher by speculating on the wonderful discrepancy between the actual profits in the fall and those he had figured out with a piece of chalk and a shingle in the spring. He was wise, solemn and rheumatic, and looked up to as an oracle by the younger men, who had his wonderful experience yet to get. When the kiln was ready to fire one of these old duffers was sent for and the performance begun. The first two or three days his principal business seemed to be to sit around on the wood pile, where he would solemnly chew tobacco and entertain and astonish the boys by stories drawn from his wonderful experience. After the water-

smoke was off he would arouse himself and get ready to show what he was there for.

Up to this time the kiln had been running with both heads open, but now one head would be closed and the firing done all from the other head. When the wood inside the arches was burned out the kiln was allowed to stand until so cold in the bottom that no sign of heat could be seen by looking into the arches, when heating up again would be begun by running coarse wood the entire length of the arches with a long pole, which it required two or three men to handle. Fine wood was then darted on top of this until the arches were full to the jets, every man working as though the salvation of the kiln depended on that job being done in the briefest possible period of time. This process was repeated until the head was settled enough, when the fires were reversed and the same operation gone through with to settle the other head, the finishing touch being given by the burning of a few cords of alders, which was supposed to give color to the bricks.

When the kiln was opened, and the usual proportion of pale, hard and melted bricks found, in about equal parts, it was pronounced a good burn, and it was considered they had had "good luck" in burning.

These kilns were set up and covered with a temporary shed, which had to be removed as soon as the top of the kiln got hot, when the whole business—kiln, wood and workmen—were exposed to the elements, with no protection whatever from either sun or rain, and it was considered a daring innovation, and rather a sign of degeneracy in the direction of effeminacy, when the writer of this, after having become nearly parboiled during a four days' rainstorm, conceived and executed the brilliant plan of devoting half an hour to putting up a temporary shed to work under. The old-timer occasionally comes around even now and speaks rather contemptuously of the luxurious ways of the modern burner, and recounts with pride the hard times he has had in the scorching sun and soaking rain of former days.

Among my earliest recollections of these old-time burners was an old man by the name of Robinson. As he must be considerably over a hundred if living now, and all trace of him was lost many years ago, when he was swallowed up in that mysterious, indefinable immensity known here at that time only by the comprehensive term, "out West," it is safe to presume that he has again emigrated to some other country, where, according to the theology of those days, alders would not be thought essential to a good burn. Now, this old Robinson, if not much of a brick burner, could discount Robinson Crusoe in the construction of marvelous stories, a sample of which I will give as nearly as I can remember it:

"Well, boys, speaking of skunks reminds me of a kiln I helped burn once down at Cathance. That was the most terrible place for skunks anybody ever heard of. One dark, foggy night we had just commenced running wood through the kiln, and I was pointing my pole for the mouth, when the biggest, fattest skunk I ever saw ran along just in time for me to catch him on the end of the pole, and away he went into the arch. Well, pretty soon the grease began to fry out of him, when it was found the kiln was getting so hot over him that something must be done or it would be melted to the ground. So the boss drove a big spike through the end of a pole, and by pushing and pulling him back and forth from one end of the arch to the other the kiln was kept from melting, but it was a tight squeeze. That wasn't the most singular part of it, either, for when the kiln was opened, after cooling off, the bricks smelled so strongly of skunk that it was several weeks before they could be handled."

As every system of brickmaking has some drawbacks peculiar to itself, and the methods I have been trying to illustrate may be new to some readers of the Clay-Worker, it is but proper to state some of the objections, which are very great ones, to our way of doing it. In the first place, the work is very laborious, and requires strong, able-bodied men to do it. As they have to work barefooted, and as nearly naked as a

ballet dancer, with cold water dripping over them continually, the season in this climate is necessarily short, coming in the best and busiest part of the year, and the rate of wages is correspondingly high. As the bricks all have to be laid on the open yard, exposed to the weather for at least twenty-four hours, the difference in seasons may make, and frequently does make, just the difference between success and failure. The present season has been the poorest one on record for fifty years, and it will be hardly possible, at present prices, to make bricks enough to pay running expenses. So a man taking a yard to run by the thousand, as is frequently done, has no basis to figure on, and the owner of the plant is in the same fix. What was accomplished one year is no criterion by which to figure on what may be done the next, and the result is a compromise, in which they are both taking chances on the weather, or, in other words, "going it blind."

There have been great changes in the class of workmen employed in the business within the experience of our old operators. It is as rare now to find a native American at work in a brickyard in New England as it was to find a foreigner forty years ago. The evolution, whether forward or backward I leave you to judge, has been from the honest, robust, native country boy to the Irishman, equally robust, perhaps, but of sometimes doubtful morals. He had his day, but has now been supplanted almost entirely by the Canadian Frenchman, in regard to whose morals and honesty there need be no doubt at all. He has changed the whole character of the business, and can now be almost considered a necessary part of the outfit, virtually monopolizing brickyard labor, as, indeed, he bids fair to do all branches of labor throughout New England.

MUDLARK.

THOSE WHO HAVE GONE BEFORE.

SINCE OUR LAST annual meeting some of our members have gone to that land from whence none ever return. Among these our venerable friend, J. W. Crary, from whose pen have come to us through the columns of the Clay-Worker, regularly and faithfully, his invaluable contributions to our literature. How the readers of this journal will miss the familiar signature as well as the timely advice and admonition that always accompanied it! He placed his best thoughts and opinions on record each month, and whoever does this subjects himself to criticism, and none knew this better than he; but he had the courage of his convictions, and braved all criticism and comment. The writer did not always agree entirely with Mr. Crary, and, while we discussed our differences publicly, we had some friendly private correspondence, and soon came to know each other better. Then we traveled our way in peace, if not always in harmony. He was a philosopher, public spirited, and proud of the craft in which he stood so high, and much of his teaching will endure the test of time. We need more men of his kind. May he sleep peacefully on the shores of the sunny gulf.

Another comes to my mind, one whom I have known and respected for more than twenty years, our brother, S. K. Fletcher, of Indianapolis. I always found him a cheerful companion, a kind friend, a courteous gentleman. I was in his employ for several months, at one time many years ago, and received the same considerate treatment that he accorded me before and since. If you want to know a man, enter his employ.

Friend Fletcher's cheery smile will greet us no more; his voice is stilled forever; he lives only in memory. His chair must be left vacant; there is no one to take his place. A good citizen, a brave soldier, a kind father and generous friend.

Still another comes to my mind. Death has been among my friends this year. In the death of Brother Lewis Oliff, of Louisiana, our Association has lost a noble, manly, faithful member. After the Atlanta Convention he visited me at my home; at Buffalo we shared the same room. Since his death his Superintendent writes me that he was a kind and considerate employer. What can be added to this tribute to his goodness of heart?

"Art is long and time is fleeting,
Though our hearts be strong and brave,
Yet like muffled drums are beating
Funeral marches to the grave."

R. B. MORRISON.



Number Three.

MONTHS HAVE COME and gone since last I wrote of the Mud Puddle Club and its doings. In some way or other the long, hard winter has been lived through, numb, aching fingers and hungry mouths are now but a memory, and the whole world seems changed into one immense garden; the days are hotbeds, full of growth, and the nights sprinkle each bit of life, joyously adding their nutritious help.

Spring has come, work is plenty, and once more the whirr of the great heavy machines and the song of the coal heavers tell the "mother" at the door that Friday will bring the much-missed market money again; the smoke from Sandy's first kiln is hanging over the shed ere it goes slowly upward, vanishing in the clear blue air above, and all the lazy day there has been a little suppressed hum of anticipation audible, for to-night Paddy takes to himself a wife; the "b-boys" are all to be at the "splicin'," and Paddy has promised them a "shake-down."

Kitty Donohue, Sandy's daughter, was the belle of the yard. Being the burner's daughter, the position belonged to her by right of birth, but, although she may have gained it that way, she held it by a thousand little feminine arts and graces of form and feature, and many's the single man that slyly "slicked up a bit" when it came time for her to trip down the lane, as neat as a pin, with old Sandy's dinner pail swinging from her hand.

In the front rank of her admirers stood foremost Sanchy and Paddy, and it was nip and tuck as to who was the favored one. The matter was eagerly discussed about the yard,



"Walking him Spanish out of the gate."

and each little indication watched and commented upon. If she came in the kiln shed way it was a good sign for wheeler Paddy, and that Irishman would handle three times his share

of brick that afternoon, but if she happened machineward during noon it was Sanchy's time to strut. They all thought "poor Paddy" when Mickey reported having seen the temperer and Kitty sitting very close on the one front step of Sandy's cottage, but the tables were turned when the same enterprising youth related a garbled account of the conversation he had heard from the top of the apple tree in the back yard, Paddy and the fair one having met by appointment underneath.

Kitty was a smooth coquette, and with consummate skill managed her two admirers so they never met but once. Paddy



"Dancing as never two people danced before."

would often get jealously angry, and swear "he'd be domned if he'd see the little witch" again, but the next day Miss Kitty would slyly drop a little package done up in brown paper on the burly fellow's wheelbarrow, and Paddy had pie for lunch that day, it was noticed. Mistakes will happen, though, and one day Kitty got a little mixed on her dates and told them both to come on the same evening. Sanchy got there first, but had been seated on the step but a few minutes when Paddy comes walking down the little graveled walk as though he had the right. It must have been a trying moment for Kitty, for she afterwards said she was expecting only Paddy, and, of course, the first comer was very angry and growled out something about "folks comin' as wuzn't wanted," but the Irishman leaned himself against the side of the house like he meant to stay, and then Sanchy started upbraiding his sweetheart. We all know how it is in such cases; the more he said the more angry he became, until finally the tears of vexation stood in Kitty's eyes, and Paddy then interfered by taking him by the nape of the neck and walking him Spanish out of the gate, all the time cooing to Kitty, and consoling her, and telling her: "Never yez moind, now, Kitty, me darlint, fur Ise knows as it wuz no fault o' yourn; jist yez tell him to go fur all time, loike a gude gurl, an' come to yer own Paddy boy fur now an' furever, me colleen," and poor Sanchy had to walk sadly away into the night, with other parts of his body sadly sore besides his heart.

And to-night is to be the wedding "over to Sandy's," and it is with glad hearts the boys see the sun slowly setting in the west, and when, finally, the last row is put out and the last barrow load has been tossed, with a comforting swish, into the setter's hand, it is with a whoop and a yell they all make for home to don their best, and immediately afterward

repair to Sandy's neat little cottage. There has been a busy hum about the latter place all the day, and now all is spick and span—the carpet up in the front room and the floor clean and waxed for the dancers.

The knot is firmly tied, and Patrick McFlanigan and Kathleen Donohue are made duly man and wife. Each and every man, woman and child kissed the bride in most approved fashion, and then Paddy takes off his coat, for all the world like he owned the place—for he has a national trait of making himself at home—grabs old Cap'n Johny by the arm, leads him out into the center of the room, now all clear for dancing, and, after introducing him as the "thiddler o' the evenin'," finds him a chair and orders him to "chune up."

And what a dance that was! They all stood back and gave the newly married pair the room. Kitty was as nimble as Pat, except that she went through her steps with arms akimbo, whilst her partner used his as freely as his legs. They first started off with a dignified little mincing step, "down the center," then separated. "Shaysaa!" yelled Paddy, at the top of his voice, and then, with a yell, he went at it—first one foot, then the other, "forward and back," "two hands around," finally landing on both feet close up to Kitty, and with one arm about her waist he lifted her clean off the floor and almost carried her down the room, revolving frantically to the music, getting ever faster and faster; then back to back up the room, his brogans ever hitting the floor in time with the "Arkansaw Traveler" and "Can't Ye Be Aisy," whilst the musical patter of Kitty's heels could only be heard whenever Paddy left the floor for two or three measures, which feat never failed to bring down the house.

Can you see them all? Sandy and Mrs. Sandy, and the young Sandys; Fritz and his "frau woman," as Sanchy called her; Mickey and the Little 'Un, with Big Mike in the background, and old Cap'n Johny sawing away as though his life depended upon it. All the folks are ranged around the room, and the two recently married dancing as never two people danced before—ever faster, ever more joyously and more fun producing, and I doubt not they would be dancing yet, but that Cap'n Johny broke a string and they simply had to stop.

After this a "set" was formed, and the party "chased the squirrel" and "dooce-Y-doo'd" for a good half hour, until Mrs. Sandy took Sandy's arm, Pat and Kitty fell in next, and the remainder got into line somehow and filed out to the kitchen, where a glorious repast was served. There was beer and whisky galore, and all the good things that are dear to a brickyard man's heart, from "wieniewurst" to ice cream, and it was late in the night when at last Paddy tucked his bride under his arm and took her away to the little cottage under the hill, where you can see him any time now, of a summer evening, sitting in the shadow of the vines on his trim little porch, with his trim little wife ever by his side.

MIND YOUR OWN BUSINESS.

Don't watch your competitor too much. Of course, you want to know what he is doing, and you ought to know it, too, but it don't take all your time to gain this information. Don't lie awake nights to worry about him. It's unwise and far from healthful to lie awake for any reason, but it is the very height of folly to allow him to keep you awake. It's precisely what he wants to do. Don't get upset when he makes a successful move. Don't get into the dumps, even if he seems to lead in the race. Just mind your own business: Put all your time and all your talent and all your capital into it. Watch every corner. Work every profitable plan for all that there is in it. Be fair and square with everybody, your competitor included. Let people see that you are an honorable, straightforward man, engaged in a manly effort to support yourself and lay by a little for the rainy day. Keep a stiff upper lip all the time and look as if you were a success. Perhaps there's plenty of room for both your competitor and yourself. If there isn't, it's the man who works hardest at his own business who is going to survive.—Trade Magazine.

Written for the CLAY-WORKER

A HOLLOW BLOCK PLANT.

Planned for Working Seventy to Seventy-five Tons of Clay per day, Producing a Bulk Product Equivalent to About Sixty-five Thousand Brick—Including Some Estimates of Costs.—No. 5.

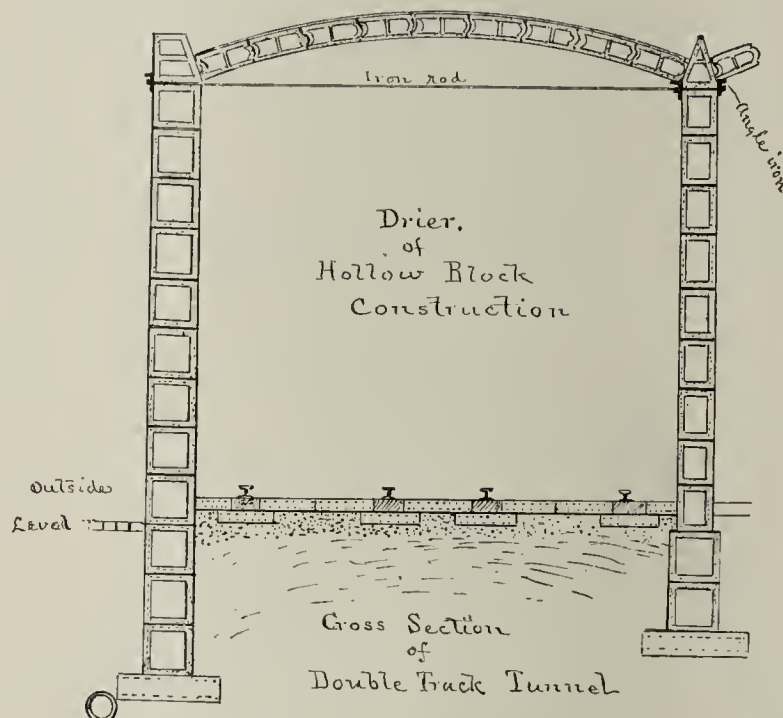


THE IDEAL HOLLOW BLOCK PLANT has not yet been built, but that of the Canton and Osnaberg Brick and Tile Company, located at Osnaberg, twelve miles from Canton, O., is perhaps the nearest approach to it.

These works were built somewhat with reference to the "lay of the land," and when the daily product was rated at much less than is now being realized by that company, the size and location of the kilns with reference to the balance of the plant, and the failure to make fire-proof, constitute, however, the chief differences to be noticed here.

In laying out our model plant the question of "what shall be considered a ten-hour-day product?" must constitute a basis for the drawing of the plans. Our estimates have been, as indicated at the heading of this article, with a reasonable margin at drier and kilns for an excess to cover any probable losses, that an average of 4,000 merchantable $8\frac{1}{4} \times 8\frac{1}{4}$ -inch blocks, or their equivalent in other sizes, may be maintained.

Believing that hollow blocks are the best material that can be



employed in general construction, they may be found in every part of these works. The reader will find them in some new forms and combinations, adapting them to certain purposes, which, we believe, will call for the hearty indorsement of practical men.

—Fire Risks.—

Of late years it has become more and more apparent that clay works, for the manufacture of machine made products especially, are of an extra hazardous character, and are so rated by the insurance companies, levying no small tax upon the owners, while at the same time jeopardizing the continuity of the business being carried on—a matter of serious moment where large contracts are entered into.

While this state of things exists, there is no good reason why it should be so, but the best of reasons why it should not be, for fire risks are very largely increased by faulty dry-house construction.

We hope to show in this paper that at very moderate cost

the clayworker may provide himself with a material that has not been approached by any other for its adaptation to this special use, and that for other reasons than its fire resisting qualities it may be rated as the very best. Almost as good reasons exist for its use in other buildings or structures making up a clayworking plant, and we may add that the clayworker of to-day who has facilities for producing machine made wares, or who is located where they can be had at a reasonable figure, ought to be ashamed to employ anything inferior to clay for a roof covering, since admirable tile of light weight can be cheaply produced on an auger machine in the use of inexpensive dies.

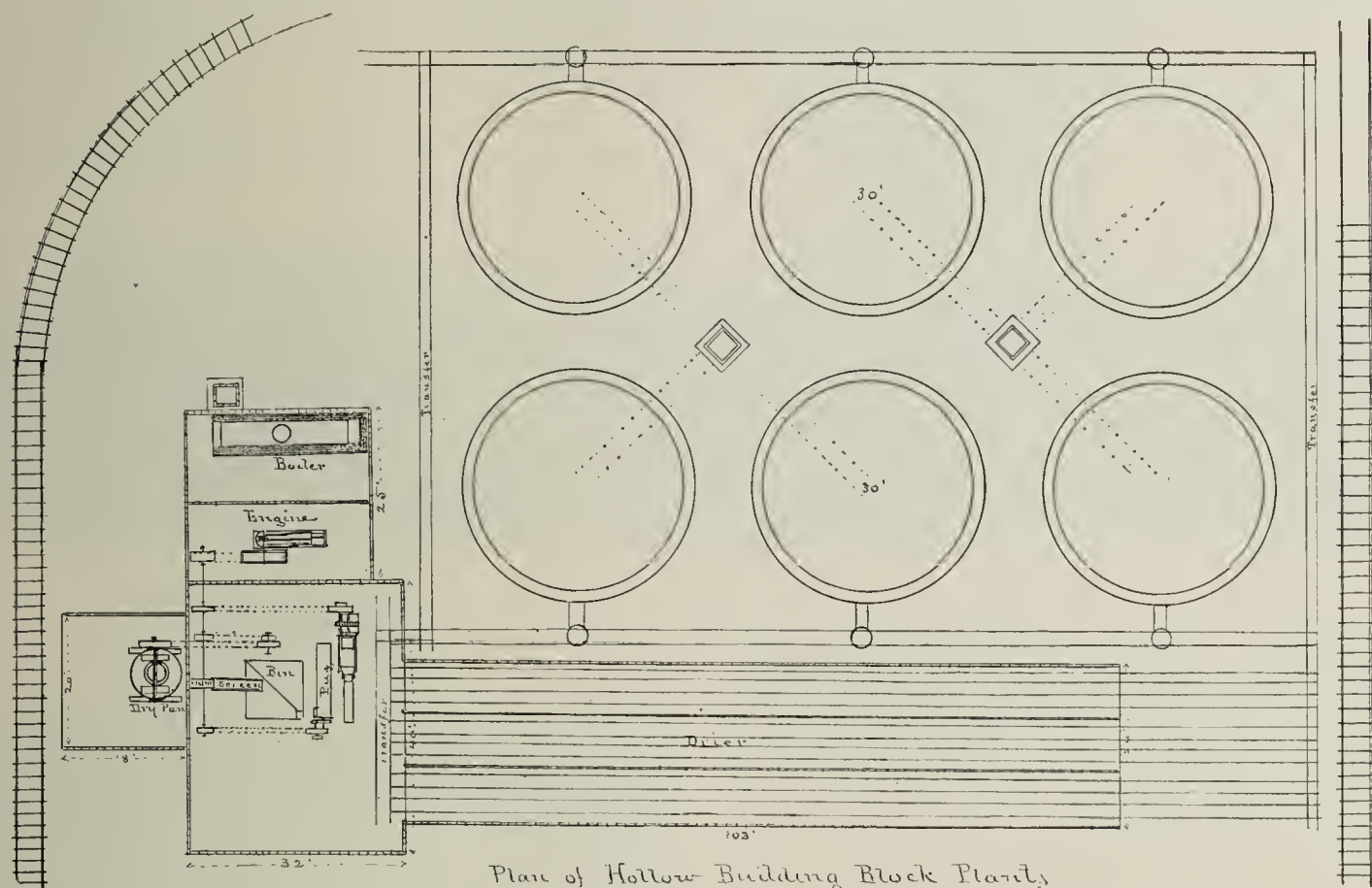
With these preliminary observations we now present ground plans which, to our mind, embody the greatest possible compactness and occupy a space of but 130x200 feet, including railroad tracks at each end of the works, and also on one side. The kilns are, if round, necessarily 30 feet in diameter, that each may hold the output of a ten hours' run. Kilns for the burning of hollow blocks are not subjected to the extreme heats that are required in the burning of pavers and other heavy

4,192 blocks. Each of the 30-foot kilns will accommodate this number when piled on end five feet high, which is the usual custom.

It will be apparent that single track tunnels may be constructed on the same general plans if preferred, but we believe the two-track, while costing less by the expense attending the building of two inner walls, will be equally as efficient, while the cost of introducing heat in three compartments will be considerably less than if introduced to six.

The outer walls of the drier shown are built above the foundations of $8\frac{1}{4} \times 8\frac{1}{4}$ -inch blocks and the inner walls of $6 \times 8\frac{1}{4}$, the walls of these blocks being about one inch thick. The foundation blocks underlying each wall are $4 \times 12 \times 16$, double cored, laid transversely to the line of the walls. The foundations of the inner walls are carried to a less depth than the outer because not subject to the same frost disturbances.

The arch, which may be laid quite flat, as shown—having a spring of but 9 inches—is of book tile, 4×9 inches, of 16-inch length. These should be laid dry, with broken joints, each alternate block lapping to the center of the blocks laid parallel with



wares that require vitrification, and hence are not subject to the same wear and tear as kilns so employed. Square kilns may, of course, be substituted, but at the expense of compactness.

In the plans shown two smoke stacks are provided for six kilns; as the time required for firing is not more than forty-eight hours, but usually less, there are never more than two kilns making demands upon a stack at the same time.

We will now give ourselves to some details of construction, after which we shall be able, with greater intelligence, to discuss the layout of the whole.

—Drying Tunnels.—

We first present a cross-section view of one of the three double track tunnels constituting the drier, the outside dimensions of the whole being 24×103 feet, and having a height of 6 feet from floor to spring of arch and to the tie rods which are seen at that point; this leaves near 2 feet of head room between the tie rods and the top of the loaded double decked car, which, when carrying two tiers of $18\frac{1}{2}$ -inch green blocks, has a total height of 4 feet and 2 inches. The drier will accommodate 84 cars, each holding 48 $8\frac{1}{4} \times 8\frac{1}{4}$ -inch blocks, or a total of

it. When laid, the joints should be slushed with a cement mortar. When the joints of arch have been filled, a finishing coat of good hydraulic cement should be laid over the whole surface. This will make an excellent weather-proof roof for the tunnels, which, whenever it shall be necessary, may be treated with a paste of cement thoroughly brushed in, or, better still, with asphaltum or coal tar, which, under a warm sun, will melt sufficiently to mend itself if any checks shall occur.

Notice, too, that the beveled blocks capping the wall and forming seats for the arch blocks are 4 inches thicker than the arch blocks, and form the sides of gutters for carrying off storm water. The walls should be laid with a slight pitch from front to rear end to secure such disposal of storm water, and the floor and track of drier may be given the same pitch, which is desirable for the easy movement of cars through the tunnels.

One of the main essentials in a drier, as in a kiln, is that it be free from any tendency to draw dampness from the ground. Notice how naturally and perfectly hollow block floors and foundations make provision against such evil. When foundations are being laid perfect drainage should be provided for; this may be done by laying a line of tile parallel with each outer

wall at a point just below the foundations of the drier, as shown in the annexed cross-section view of one of the outer tunnels.

The track foundations, it will be noticed, are laid of hollow block, on top of which the planks to which the rails are spiked are laid, the 2-inch hollow floor tile being laid on a properly prepared bed of sand or gravel, on a line with the top surface of the plank, thus holding the plank securely in position.

We purposely avoid discussing here methods of securing heat for drying purposes, but will only say, in passing, that to our mind no other method of constructing drying tunnels affords such facilities for the introduction and disposal of heat as hollow blocks, whether for piping or for the introduction of heated air through the agency of fans.

We have given more space to the drying section of our works than would be warranted was not the subject of first importance, united with the fact that block construction throughout is a remedy for many evils.

The only wood found in the drier shown is the rail plank, and the doors may be covered on the outside factory end with sheet metal as against danger from any exposure which can come only from the exterior.

We will not attempt to discuss any particular features in the kilns, but simply say in passing that, building for ourselves, we should certainly incorporate in the walls a thin hollow block section to prevent the loss of heat.

—Smoke Stacks,—

Of course, should be of hollow blocks, and for two good reasons: First, because a better draft can be secured in the use

boiler, is deemed sufficient for the operating of the machinery listed below. The outfit named is such as is ordinarily used in the manipulation of plastic fire clays. Different classes of clays may call for a substitute for a dry pan:

- One 8-foot dry pan.
- One 25-foot elevator.
- One screen.
- One 12-foot open pug mill.
- One block machine.
- An outfit of dies.

In some cases a fan may be required for the distribution of heat for drying and other purposes.

—Men Needed.—

Assuming that clays and fuel are delivered in bin, the complement of men required for operating such a plant is about as follows:

- One engineer.
- One machine foreman.
- One day burner.
- One night burner.
- One man at dry pan.
- One boy at pug mill.
- Two men at machine.
- One car man.
- Eight men loading and unloading kilns and in yard.
- Three men on hand work and to take place of absentees.
- Total, twenty men, engaged strictly in production and handling of products, exclusive of teaming and office work.

—Estimated Outlay.—

The entire cost of erecting and outfitting such a plant may be estimated at from \$20,000 to \$25,000, depending upon local conditions, and from our standpoint it will be quite impossible to equip a plant for the production of any other clay wares for



FRIEZE IN MAIN CORNICE.—Building for T. E. Proctor Estate, Boston, Mass.—Winslow & Witherell, Architects.

of them than of other material, and, second, because they can be built at less cost. The best kiln and boiler stacks may be built of hollow blocks only, from foundation to cap.

We should feel called upon to make some proof of our assertions here but for the fact that the columns of the Clay-Worker have been opened to us to treat of kilns, driers and all that pertains to them, a privilege of which we hope to avail ourselves in the near future.

—Factory Buildings.—

Referring now to the ground plans, we call attention to the exceeding simplicity and compactness of buildings, designed—and of ample size—for the production of building material equivalent in bulk to about 20,000,000 brick per annum, the machinery building proper being two-story, 32x40 feet, with a "lean to" for dry pan 18x20 feet and an engine and boiler house 25x28 feet, the foundations and walls of which should, of course, be of hollow blocks. If it is urged that blocks might need to be purchased for this purpose at a long distance from the works being erected (and so of the roof tile), it may be answered that circumstances may require that the foundations be laid of the cheapest material at hand, provision being made for a subsequent laying of block walls from the factory's product when running, a permanent floor for reception of machinery being laid, and substantial framing for support of second-floor machinery, semi-independent of the light balloon frame, roughly boarded, which may be made to do duty until blocks are produced, and a double rough board roof be laid temporarily, to be superseded by tile. Temporary drying arrangements of similar character may also be made for the early drying of blocks, which shall later enter into its construction, and the material used in these temporary structures may be later used in sheds, etc.

A live Yankee will find a way of furnishing his own material, or most of it, by means not exactly analogous to lifting himself over a fence by a pull at his boot straps.

—Power and Machinery.—

A 75-horse-power steam engine, with a 100-horse-power

the same outlay and secure from it a product of equal money value.

One feature which gives exceptional value to hollow blocks is brought out in the discussion of the details of this plant. We refer to its qualities for the non-transmission of heat or cold. This is most noticeable in the drier construction. To almost as great a degree it inheres to the value of chimney construction, and, we believe, also to kiln construction, basing our opinion upon what has been already accomplished in this line. They have no less value when used in the construction of engine and boiler houses, and, indeed, throughout any plant where there are water and steam pipes to suffer from freezing, and in clay works, where a night of exceptionally or unexpected cold weather will result in frozen masses of clay in pug mill and in block machine. For these ills the block is practically a remedy, and, in regions invaded by zero weather, will save days of inactivity and heavy bills for repairs, while adding immensely to the comfort of workmen.

We may allude, in closing, to the general layout of the works for the handy production and easy handling of the material employed from start to finish and from finish to loading on cars, the longest carriage, from furthest kiln door to car track, being but 110 feet.

As an illustration of the clock-like regularity with which a hollow block factory may be run, we quote a statement made to us by J. A. Merley, the Manager of the Canton and Osnaberg works (before alluded to in this article), to the effect that, having but five kilns, that company, in a period of six months, burned an average of six kilns of ware per week, with but two interruptions, which occurred when putting a new crown upon a kiln.

It will be evident that our plans are of a factory which may be run twelve months of the year in any climatic conditions found between Canada and the Gulf of Lower California.

E. G. DURANT.

The aim of all good advertising is not to pull down somebody else's business, but to build up one's own.—Printer's Ink.

Written for the CLAY-WORKER.

TERRA COTTA CONSTRUCTION.

BY R. N. BUELL.

IN THE FOLLOWING ARTICLE the author has endeavored, in his crude way, to point out some of the more common blunders of contractors and others in terra cotta construction, and, incidentally, takes the liberty to advance a few simple rules which, if strictly adhered to by those engaged in the setting of terra cotta, will, he believes, tend to obviate the difficulties both of the builder and manufacturer.

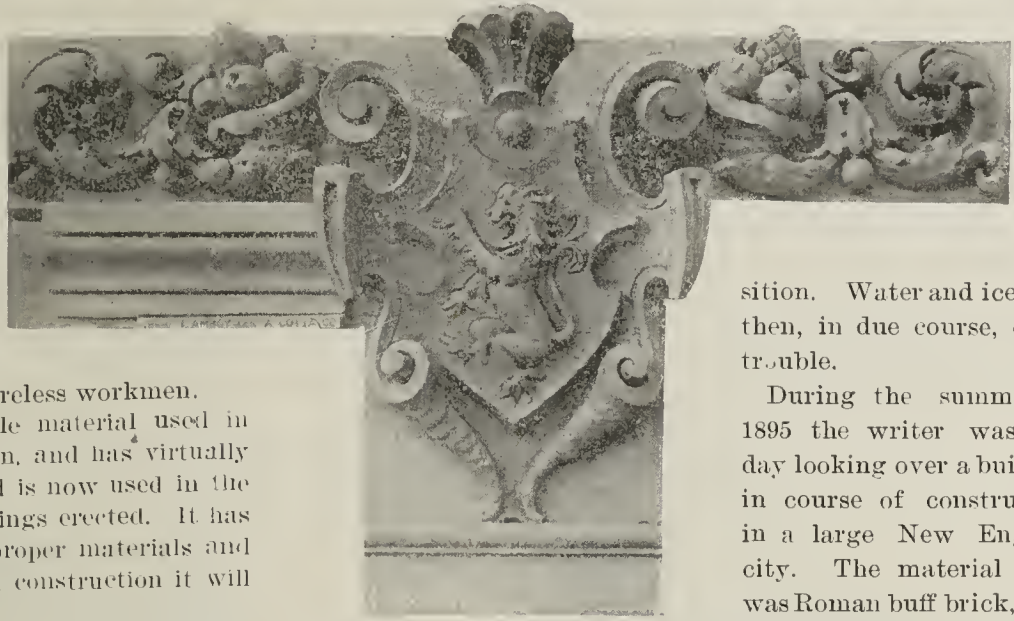
Where is there a maker of terra cotta of any experience who cannot recall with a tinge of sadness numerous instances where his beautiful productions, the result of painstaking efforts and a liberal expenditure of cost, have been laid on the altar of ignorance, a sacrifice to careless and stupid setting in construction? Thus a beautiful piece of work, which skillful artists have so carefully designed and cunning workmen so faithfully reproduced, which has been tenderly watched and guarded all through its various stages of manufacture and brought forth a work of art, is spoiled by careless workmen.

Terra cotta is to-day the most available material used in every assemblage of architectural decoration, and has virtually taken the place of stone in this respect, and is now used in the completion of four-fifths of the larger buildings erected. It has great lasting qualities when made of the proper materials and well fired, and when proper care is used in construction it will endure and be a thing of beauty for ages.

It is customary to speak of terra cotta as being light in weight, but this is really only true in regard to transportation of the surfaces, for when terra cotta is set in place and properly filled it becomes the same actual weight as brick work, and very much of the same construction. Therefore, all excessive

feet there is a convenient joint, which, when the pointing becomes loosened, as it surely will, will freely admit the rain-water and let it soak into the walls, so that in the winter time ice will be formed and injury to the structure result. Surely this is not the fault of the terra cotta, although the material is often blamed in such cases.

Almost all our cities contain fine buildings which are hideously disfigured by black and grimy streaks leading down from the vertical joints in the molding or cornice. In the use of terra cotta the prevention of this evil by properly filling the joints is imperative if you would not have a begrimed and dirty building. Careless workmen will often neglect to fill in the work properly when it is being placed in its permanent po-



LINTEL AND PANEL WITH CARTOUCHE—Building for Wells & Dana, Trustees, Boston, Mass.—Winslow & Wetherell, Architects.

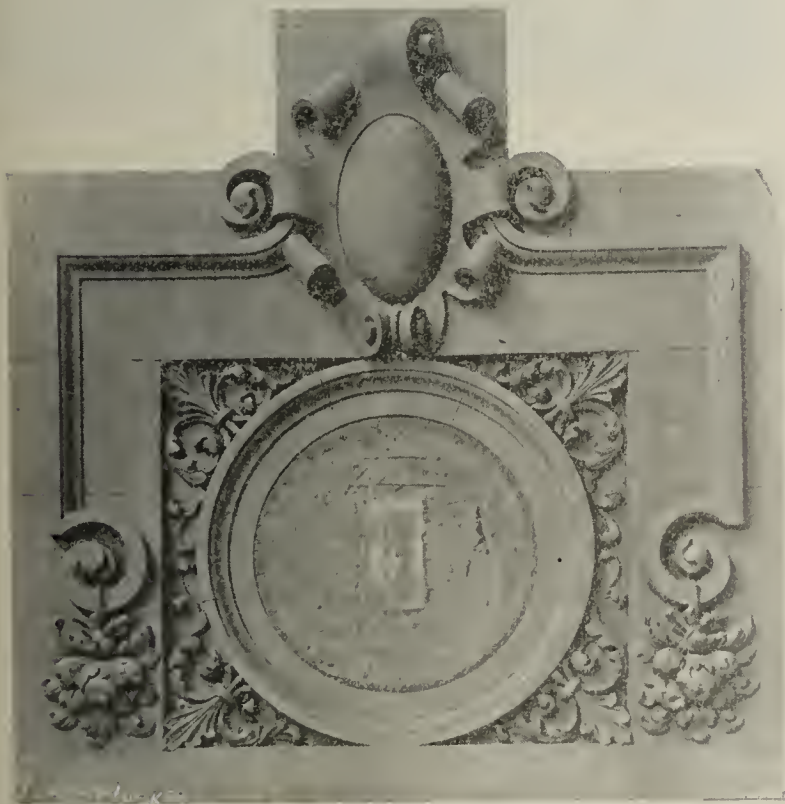
sition. Water and ice will then, in due course, cause trouble.

During the summer of 1895 the writer was one day looking over a building in course of construction in a large New England city. The material used was Roman buff brick, with terra cotta trimmings. The corners were composed of terra cotta quoins. For some reason, one of the corners was ordered to be

torn down about ten feet. To my astonishment, I discovered that not one quoin in the entire distance contained a particle of filling. The architect's attention being called to this state of affairs, he immediately ordered the contractor to discharge the negligent workman, and further ordered him to tear up the affected corner clear to the ground and rebuild it properly.

Mr. Holmes, of Fiske, Holmes & Co., Boston, says regarding this subject: "Of course, there are instances, where terra cotta comes near the top of the wall and where little weight is placed upon it, that it might be excusable in not filling the spaces in the rear of the same; but under other conditions we can certainly say that it is a much more mechanical operation to do so. Terra cotta, when properly made and burned, with the requisite divisions of clay to distribute the weight, should carry a considerable load without any tilling, and there may be cases in iron construction where filling is not always used, but we think the cases very rare, and it is usually customary, and certainly a legitimate practice, to adopt this safeguard."

Always, in setting terra cotta decorations, point all the joints when the pieces are set, and not when the building is washed down; also, use mortar on the outside as near the color of the terra cotta as possible, especially in setting panels, bas reliefs, etc., where it takes several pieces to form the figure. I recall an instance where this caution was not observed, and the result produces an effect which to an artistic eye completely overshadows the beautiful appearance it would otherwise present. In the front wall of the Yale College Gymnasium Building, at New Haven, Conn., are a series of terra cotta panels, representing Grecian sports. These panels are probably eight or ten feet in diameter, and composed of several large pieces. The terra cotta is dark buff in color, while the joints, which, in some places, are probably an inch thick, are filled with white mortar. The appearance presented by this contrast in colors reminds one more of an old-fashioned crazy quilt than a rare work of art.



LINTEL AND PANEL TO DOOR.—Building for T. E. Proctor Estate, Boston, Mass.—Winslow & Wetherell, Architects.

projections, spans or openings should receive a sufficient backbone of iron construction. There are instances in New York city where cornices with three feet of projection are simply covered by inverted boxes of terra cotta, each box capable of containing many gallons of water, and at about every two or three

In conclusion, the author presents these few practical rules for the guidance of those engaged in the setting of terra cotta, and in connection therewith his thanks are due to Mr. Benjamin D. Walcott, President of the Indianapolis Terra Cotta Company, for his practical suggestions:

1. All terra cotta work should be filled in thoroughly solid with brick and mortar, care being taken that all the hollow parts be filled up, and when not practical to do this on the wall it should be done on the ground.

2. All lime mortar for filling in and setting terra cotta should be thoroughly slacked and should be made up fully two weeks before being used to prevent the slightest expansion.

3. The beds of all terra cotta blocks should be at least one-eighth of an inch thick and the blocks bedded down solid. No block should be allowed to ride one on the other, nor upon the brick work, but should be leveled upon a mortar bed, and so prevent any cracking from the settlement of the building.

4. All rebates in the joints of the terra cotta blocks should be filled up solid with mortar and not left hollow, and the outer edges of all joints should be bedded with colored mortar and pointed wet. No work should be set with dry joints, and the pointing of all joints should be done when the work is set, and not when the building is cleared down.

5. No wedges should be used, either in the beds or joints. All beds and joints should be made solid with mortar and the blocks driven home to their right position and bearing.

6. All terra cotta should be cleaned, or "washed down," after the building is up, with a weak solution of oxalic acid and water, and some good authorities recommend also a coat of raw linseed oil; if this is done, no coloring matter should be mixed with the oil.

Written for the CLAY-WORKER.

THE NEW ENGLAND STOVE LINING ASSOCIATION.

THE REGULAR AUTUMN meeting of the stove lining branch of the clayworking fraternity, with its usual accompaniment of a clam bake, was held at Dighton, Mass., on Wednesday, Aug. 25. There was a large gathering of the members and their friends, together with several visitors from other States, at this autumnal festival on the shores of New England, for such it is in its most agreeable aspect.

Except the annual powwow of the N. B. M. A. there is no assembly of fire-clay workers which can excel the Dighton meeting as an evidence of the friendliness and trade good will among the brickmakers. New England is famed for its generous hospitality.

Among the visitors were the President, S. D. Horton, of Peekskill, N. Y.; ex-President H. S. McLeod, of Troy, N. Y.; H. A. Perkins, of Brooklyn; S. H. Helman, of Buffalo, and Charles A. Bloomfield, Metuchen, N. J., and the representative of the Clay-Worker, who was cordially invited by the genial Secretary, B. C. Peirce.

One of the most interesting features of the meeting was an excursion to Taunton by the visitors to inspect the works of the Presbrey Stove Lining Company. This factory is very extensive, and is one of the best equipped manufactories for the production of stove lining and other fire brick goods in the Eastern States. It is completely furnished with the most approved machinery for the preparation of the clay and for molding and repressing of the ware. The arrangement of the various workshops is so planned that each successive stage of the working proceeds in an orderly manner until it enters the kiln, and from the kiln to the warehouse and delivery sheds. The lighting and heating and the ventilation of the several molding and finishing shops is so well devised and thoroughly provided for that there is no need to use any inclosed drier.

The visitors were particularly impressed with the air of cleanliness and good order in the workshops. The molds, when not in actual use, are stored in a separate fire-proof building, so that there is no disorderly accumulation of dirty molds, etc.

The Secretary of the Stove Lining Association is the Gen-

eral Manager of these works, B. C. Peirce, and his success as a Secretary is a fitting sequel to his ability as a General Manager.

The clam bake was under the management of Gideon F. Francis, of the Dighton Stove Lining Works, which is a sufficient guarantee of its quantity and quality. It was, indeed, a banquet of sea food.

The meeting was held in the spacious and pleasant clubhouse of the Taunton Yacht Club, the use of which was kindly granted to the Taunton fire-brick makers for this occasion.

At the business session of the meeting several very important matters were considered and discussed, very satisfactory solutions being arrived at, so that this autumn meeting of the Stove Lining Association was a fitting successor to those which have passed into history.

The Pennsylvania contingent was conspicuous by its absence, for reasons stated in a letter by the Vice President, Benjamin Fox, of Reading, Pa. It was rumored abroad that certain parties were to try to paint the city of Reading a very deep red color, and as Brother Fox is somewhat of an artist himself, he felt called upon to stay at home to see that the work



Taunton Yacht Club House, Dighton, Mass.

was well done. Therefore his absence from Dighton is excused this time.

A hearty vote of thanks is due to Mrs. Peirce, Mrs. French, the Misses Williams, Mrs. Francis and the several ladies of Taunton who did so much to make this social feature of the Stove Lining Association the grand success it was.

JAMES TAYLOR.

ON THE THRESHOLD.

We stand to-day on the threshold of an epoch of business prosperity which promises to surpass any other in our history. The extension of trade, the growth of industries, the expansion of commerce, the accumulation of wealth, and the magnitude and magnificence of invention, discovery and achievement to which it will attain will equal the most dazzling flights of the imagination or the most daring predictions of prophecy. This new thing which we observe is no sporadic movement doomed to pass into desuetude and death. It is the nascent life of a virile and forceful power, which will soon infuse itself into every branch of business and reach into every nook and cranny of the land, transform this doleful people into the happiest, the healthiest, the most cheerful and most active in all the world. —Art in Advertising, New York.

Economy in advertising—as in eating—doesn't consist in seeing how little of it one can do and live.—Printer's Ink.

USE AND ADVANTAGE OF HOLLOW BRICK.

BY J. M. MAMER.*



IN THESE DAYS of progress and close competition there is nothing more essential to the success and welfare of the clayworker than the production of such materials as may be best disposed of in the immediate vicinity in which his works are located. Especially is this so with the smaller manufacturers located on a single railroad, thus being practically annihilated as far as shipping facilities are concerned. For such as these it would be well to ask themselves the question, Why are most buildings, and especially dwellings in small towns and farming districts, constructed of wood? The number of residences built of brick, outside of the larger cities, are so deplorably small that we may as well say there are none. And why is this so? It is safe to say that the chief cause lies in the effect of "first cost." It has remained therefore, for us, as producers of clay ware to bring into use something practical, out of which residences, store buildings, etc., could be built as cheaply as of wood. This has been thoroughly accomplished by the introduction of hollow brick.

By the use of this material a building is made fire, climate and time-proof. It is fire-proof because, being a production of fire, there is nothing to consume; it is climate-proof because the severe blasts of zero weather that come upon us so suddenly are as little able to penetrate its dead air chambers as are the rays of the fiercest July sun; it is time-proof because, not being affected by the elements, it is practically indestructible. It does not corrode like iron or steel, nor crumble like stone; it requires no paint to ornament it, nor a continued renewal of the same to preserve its appearance; in short, the advantages of a hollow brick over a wood frame building are so numerous that it would be useless to try to mention them in the confines of this paper.

The question may be asked, Why have hollow brick not come into more general use? The reasons are many. In the first place, the people who know that such a building material is made are comparatively few; second, not being familiar with its advantages, they may be somewhat prejudiced against it; and, further, the fear of a high first cost prevents many from ever inquiring into the subject. These causes may be attributed to the fact that no class of manufacturers advertise so little as do the clayworkers. Our own experience in introducing hollow brick has been slow. In the fall of 1893 we built a residence of them for our own use; in the winter of 1894-5 we erected a factory building out of the same material, and while we have sold quite a number for building cellars, giving the best of satisfaction in every case, it was not until the fall of 1896 that we had a chance to put these brick into a building outside of one for our own use, and this we accomplished only by making a bid for the contract against a bid for a wood structure. Therefore it is advisable, sometimes, for the maker of hollow brick to become a contractor at the same time. It is the quickest and safest way to introduce the brick, and, when once introduced, there will be no question as to their utility.

We are often asked whether there is no danger of these brick crushing when used in foundations or in walls of buildings whose floors would have to sustain heavy loads, etc. To answer these questions by a practical illustration we took a lintel 3 feet 6 inches long, made on a 6x8 die, supported it at each end and piled on all the common brick we could, making a total weight of over 4,000 pounds. How much more it would have supported I am unable to say, but it sustained this load for a period of three weeks, which surely was a sufficient length of time.

We have recently had tests made of our 6x8x12-inch brick at the University of Illinois by the kindness of Prof. A. N. Talbot. The ultimate strength, as given in the report, was 101,000

pounds, being tested with a thin layer of fine molder's sand above and below them. Had the strain been brought upon the brick the same as when laid in the wall, i. e., directly above the vertical walls of the brick, they would undoubtedly have tested much higher. Reports of tests of hollow brick made by other manufacturers show equally as well, and some much better. The test of an 8x8x16-inch block made by the Ohio Hollow Block Company showed a crushing strength of 283,400 pounds. In this test the pressure was brought directly over the vertical walls of the brick.

Calculating by these tests, it would be safe to say that if any of the steel frame sky scrapers of Chicago had an outer wall of hollow brick, the entire weight of the wall resting on the lower tier of brick would demand only about 3 or 4 per cent. of their crushing value. Therefore there remains no question as to their strength. They will be found sufficiently strong for any practical use.

We are at present making two sizes—6x8x12 and 6x12x12 inches. Each size, when laid in the wall, presents a face 6x12 inches. With these two sizes walls of various thicknesses can be built, either 8, 12, 16, 20 or 24 inches. In all cases corner blocks are made from the 6x12 die, cut into 6-inch lengths and set on end. This makes a good bond in the corner, and also breaks joints properly. The same blocks are used next to window and door frames, thus making the same setting as with common brick. For lintels we always use a single piece of the



J. M. MAMER, Campus, Ills.

desired length, unless the opening is over four feet, in which case an arch or a steel I beam is used.

Some manufacturers make an 8x8x16-inch hollow brick, and for corners use a block made from an 8x16-inch die, which makes a very good combination, only that the blocks present a face of 8x16 inches when laid in the wall, which is pretty large, unless ornamented with various designs, which, of course, makes them more expensive. About the only advantage of the 8x16 over the 6x12 size is that it requires less mortar to lay up a given sized wall, but this difference is so little that the smaller size will more than make up the same in the cost and convenience of handling.

The uses to which hollow brick can be put are wide and various. With the different sizes and shapes as now made they can be used for any and all purposes. For residences, stores, warehouses, barns, factories, kilns, smokestacks, etc., and in many cases look better than a wall laid of common brick. Yet where it is desirable to use a pressed brick for facing, it can be done as conveniently as with common brick by tying in with galvanized iron strips or with wire. With this combination we have the advantage of a hollow brick wall coupled with the appearance of a pressed brick job. Thus we have a neat and substantial building at a less cost than where common brick are used, and, besides, needs no furring or lathing to hold the plastering.

Let me not be understood to in any way denounce the use

*Read before the Illinois Clayworkers' Convention.

of common brick. They have their place, and undoubtedly will hold it while man exists. But there are places, such as I have mentioned, where the use of hollow brick is a great advantage, especially so in localities where it is necessary to compete with wood frame building.

To summarize the advantages, we have a superior building material because offering great resistance to heat and cold. The comparative low cost for material, the small cost of laying, requiring only about one-seventh the mortar and one-fourth the labor of common brick, the light charges for transportation, the great strength, as shown by actual tests to be from 1,000 to 2,000 pounds per square inch of bed, the adaptation to varying architectural requirements, the convenience of introducing ventilating flues, electrical appliances, etc.

With all these advantages there is no reason why hollow brick should not take the place of the millions of feet of lumber that are now almost exclusively used in the construction of our suburban and country homes. It only remains for us clayworkers to take hold and push this branch of our industry to the place it justly deserves.

When tile drainage was first introduced people were slow to take hold of the advantages offered them. Many "old fogies" denounced it as the cause of bringing on all kinds of weather. But when once its benefits were properly demonstrated the progressive farmer was eager to adopt it. So, too, with hollow brick. Their introduction may be slow in some localities, but the general tendency is toward better buildings, and when the advantages of hollow bricks are properly understood there will be few who will not make use of them.

In conclusion, let me urge all who are, or intend to become, producers of hollow brick not to allow a single block to leave their works but which is, and will remain, a credit to its maker, and it will be safe to say that with our constantly diminishing forests, and consequently the advance in the price of lumber, clayworkers will be called upon to furnish the building material of the country. And, in time, every home, from the smallest cottage to the largest mansion, will be a place of comfort produced by the clayworker's art.

Written for the CLAY-WORKER.

UNRELIABLE INFORMATION.

RECENTLY THERE HAS BEEN considerable discussion on furnace grates, and some patentees and iron foundries claim they have, by various devices, arrived at a design in grate bars that saves a large percentage of fuel, while, on the other hand, I notice some who question the utility of grate bars at all, and claim to obtain better results without bars, or, at any rate, as good results. I have never known any but clayworkers make such a claim, and I never knew of any one of them advocate it for a steam boiler; still, I cannot see why it is not as good for one as the other, and, for that matter, why should it not be equally applicable for any purpose where heat is required?

Some claim they escape the expense of the bars. Granted. A set of grate bars for an ordinary kiln is no trifling first expense, but renewals will be very trifling if they receive common attention and care. Many more grates are warped and burnt out by neglecting the ash pit than by the fierce fire on top of them, and a great many are spoiled by rough treatment with the stoking tools. Many a good set of bars have been ruined by tight setting, no allowance being made for expansion. A grate four feet long ought to have one-half inch play endwise, and in the same proportion for the width.

I cannot reconcile myself to the practice of my no-grate brethren. To me it appears a retrograde step, or, to say the least, moving in the groove of our ancestors. I have seen both bricks and pottery burnt in kilns having no grates, but could never see a redeeming feature in that method. As to the saving effected, I feel quite sure the waste in fuel and the damage

done to the walls of the furnace by cutting out the "toad" or "salamander" of clinkers would fully meet the expense of grate bars.

Whatever the advocates of no grates may say, there is no denying the fact that the conditions required for complete combustion and obtaining the maximum of heat are conspicuously absent. The difficulty in maintaining such conditions with the best designed grate bars is pretty generally known and acknowledged, but the fire-on-the-floor system doubles that difficulty.

—The Checking of Clay Ware.—

Why do bricks and other clay goods check when dried rapidly? Is it weak clay? Now, then, does it make such a strong brick? I think, if we examine carefully the effect of drying a lump of soft clay under different conditions and at different rates, we shall arrive at the general broad conclusion that the shrinkage of any clay and the rate at which it may be dried are in an inverse ratio; or, to express this in plainer terms, if a clay has little or no shrinkage in drying and burning it may be dried quickly without checking, and if it has much shrinkage it must be dried very slowly to prevent checking. When a piece of clay checks it speaks in very plain language, and this is what it says: "I cannot shrink to my dry size if you allow the clay immediately beneath my surface to remain moist. I cannot occupy the same space dry as when I contained 20 or 25 per cent. of moisture, and in my efforts to shrink to my dry size I rupture myself, for the very good reason that I am too weak—yes, very much too weak—to compress the moist clay beneath my surface into its dry size, and the natural consequence is that its resistance bursts me." When we have carefully noted what this checked brick has told us we may readily draw other inferences on the subject. The one that forces itself on my attention first is that the rate of drying must not much exceed the rate at which the moisture is drawn or expelled from the center of the piece. The more we depart from this law the more manifest will become the checking. Unequal drying is another prolific source of checking. Bricks have been torn in two by defective pallets, such as have slight projections on the bed that will prevent the slide of the brick when shrinking, and such as are rounded up on the bed will tear bricks in two. I should scarcely feel justified in mentioning pallets that are too narrow for the length of the brick did I not sometimes see them used.

The laws governing clay are like the laws governing other materials, inflexible, under the same conditions of material. The mischief often lies in ignoring conditions and expecting the laws to operate just the same under a change in conditions. One man experiences no difficulty in drying his bricks quickly, while his neighbor has to exercise the greatest care and go very slowly. The amount of water in the green brick, and the amount of sand, too, are important factors. Very plastic or aluminous clay has a very close texture, through which moisture moves very slowly. It also has a maximum of shrinkage, and to expect such a clay to dry quickly without checking is to invite failure and disappointment, while sandy or silicious clays may nearly always be dried rapidly without injury. There is always need of a large amount of common sense, both in drying and burning, which is extremely difficult to teach in writing, and which I must leave for some of my practical brethren to attempt, for I feel that without it all this babble about drying amounts to very little, and may be looked upon as "unreliable information."

—St. George Journal.—

The jubilee number of the St. George Journal came out in June with popular cuts of the Queen in half-tone and wood engraving. It also came out with some "Odds and Ends from Our English Exchanges." One of these "odds and ends" contains about as much unreliable information as it could well get in the dozen lines devoted to it. Here they are verbatim:

"In the works of John Brown & Co., Shetfield, England, they have ten boilers, developing over 10,000-horse-power, in

which the air for combustion is admitted entirely over the fire. They heat the air to between 200 and 300 degrees before admitting it into the furnace, which is done by heat that would otherwise be wasted. The effect of this arrangement is that the furnaces are totally smokeless."

The 1,000-horse-power boiler is something new for me, and, while I do not question the possibility of building such a boiler, I do question the advisability of it, except, perhaps, for marine; yes, and even for that I would question it. Then, admitting the air entirely over the fire; this is diametrically opposed to Brother Stookey's views; he advised admitting all the air through the grate and none over the fire. The writer differs with both, but for a choice between the two would prefer Brother Stookey's plan. And then we are informed that this arrangement renders the furnaces totally smokeless. Like the Scotchman, "I hae ma doots about it." I have never yet seen a totally smokeless furnace; the nearest are our Philadelphia furnaces fired with anthracite coal.

The works of John Brown & Co., mentioned above, covered, thirty years ago, about twenty-six acres. They had at that time nearly, if not all out, a hundred boilers, from 100-horse-power down to 20-horse. Since that time they have increased to over one hundred acres, with correspondingly increased steam power. The writer who furnished the paragraph probably saw the immense batteries of boilers at the blast furnaces, from which the waste gases are conveyed to the said boilers, and there consumed in raising steam.

—The Uncertainty of Cast-Iron Steam Pipes.—

Cassier's Magazine, in its "Current Topics," echoes the plaint of "The Locomotive," a neat little paper published by the Hartford Steam Boiler Inspection and Insurance Company, from which the accompanying little sketch has been copied, and which, according to Cassier's "tells a good part of the story." Then it goes on to relate that "a large manufacturing establishment had a line of 8-inch cast-iron pipe which had been in use for a number of years, carrying about seventy-five pounds pressure. That part of the pipe which was in the boiler room had failed on several occasions, but each time there was some very



Section of an Imperfect cast-iron Steam Pipe.

fortunate circumstance about the accident, so that no great damage was done. It was feared, however, that this continued run of good fortune might not always prevail, and, as a matter of precaution, it was decided to take out the cast iron and put in something better. The pipe in the boiler room was removed and broken up for old iron, and was replaced by a modern wrought-iron pipe with riveted flanges. The cast iron that had been in the boiler room was entirely discarded, but those lengths that were in the engine room were supposed to be of superior quality, inasmuch as they were extra heavy and were made "on honor," and so it was thought best to preserve this part of the piping for possible future use. Not long after the pipe had been changed the company wanted a cast-iron column for some purpose or other, and, bethinking themselves of the high grade piping that they had reluctantly taken out of the engine room, they put a section of it in a lathe to cut it off to right length, and when they made the cut they made a discovery also. The nature of the discovery is shown in the sketch. On one side the pipe was $1\frac{1}{4}$ inches thick, and on the other its thickness was a scant quarter of an inch." * * *

The Locomotive then proceeds to explain the defect, which, of course, was due to the springing of the core during casting. Now, every one acquainted with foundry practice knows that chaplets are often required to hold the core firm in its proper position; when pipes are cast on a bed either flat or sloping chaplets are indispensable; when they are cast in a pit, or vertically, no chaplets are required; further, blow holes are reduced to a minimum when pipes are cast vertically.

Cassier's and The Locomotive credit the makers of the pipe with having dealt honorably in the matter, saying: "The makers of the pipe described most probably believed it to be sound and perfect, and one must therefore look to the process by which such pipe is made, if we wish to find the most likely explanation of the defect." Then the core and coremaking is described, and it is shown how easily a core ten feet long might be sprung in the center half an inch by being buoyed up by the molten iron, and, of course, this will account for the uneven thickness.

"The general conclusion," they say, "to be drawn from this example is that cast iron should not be used for steam pipe. This is a corollary to the more general proposition that cast iron should not be used in any place where it will be exposed to a tensile stress. It is good enough material for resisting compressive strains, but it is altogether too uncertain in its behavior to be trusted under tension."

The editors of both the above mentioned magazines are, without the slightest doubt in my mind, very able and clever men, but it seems they are not infallible. This attack on cast-iron pipes reveals their lack of practical knowledge on the subject, and, in one or two instances, a want of common sense. If any of my clayworking brethren have cast-iron steam pipes that may possibly be of uneven thickness do not cut them in two in a lathe to find out the fact. Just put two pieces of scantling down on ordinary level ground, a few feet apart; lay your pipe on these and roll them; if they roll evenly, their thickness is even; if the rolling is slightly uneven, they are safe enough, but if the rolling is spasmodical, reject them. The 8-inch pipe mentioned above would require the effort of a good strong man to start it, so heavy would be the thick side. An 8-inch pipe three-quarters thick would be perfectly safe with 200 pounds pressure—quite as safe as wrought-iron pipe with badly riveted flanges. If the placing of cores and casting of pipes were done as described by these gentlemen, then it would be high time to discard them, for not one in a hundred would be passable.

How such a pipe ever left the foundry is beyond my comprehension. If the proprietors were unaware of such a defect, then they had in their employ a very untrustworthy lot of men, for every man, from the molder to the shipper of the pipe, certainly knew of its defect. It could not be handled without its fault becoming manifest, and the fact that it got placed in the engine room, or anywhere else in a main for steam, discloses a want of conscientiousness scarcely credible. It seems never to have occurred to these worthy gentlemen that such a serious flaw could be discovered without cutting the pipe in two, whereas it is one of the easiest to find out.

The uncertainty of cast-iron steam pipe appears to me to rest more on the manufacturer than on the material. Those who allow such pipe to leave their works ought to be given a wide berth, so also with the mechanic who will put it up in a main.

As to the proposition that "cast iron should not be used in any place where it will be exposed to a tensile stress," this is pretty to look at, but what of it when you look into it? I will venture to assert that the manufacturing establishment that changed their steam main from cast to wrought iron still delivers that steam into a cast-iron cylinder of an engine.

I do not dispute the superior tensile strength of wrought over cast iron, nor the superior compressive strength of cast iron, yet it is not always convenient to use that which is superior. I am also an advocate for wrought steam pipe, but I would give cast pipe its due. WM. WAPLINGTON.

That the wheat crop of Europe is short is an established fact. It is equally true that the wheat crop in this country is the largest for some years. Not only so, but the price of this great staple, already high, is appreciating. This means many millions of dollars to the farmers. The tariff agitation is settled for four years at least, and in a way that will yield sufficient revenue for the necessary expenses of the government and protect our industries. This augurs auspiciously for the business interests of the country.—Ex.



THIS DEPARTMENT IS DEVOTED EXCLUSIVELY TO INVENTION AND PATENTS RELATING TO THE CLAY INDUSTRY, AND IS EDITED BY MR. EDWARD C. WEAVER, ATTORNEY AND COUNSELOR, IN PATENT LAW, MCGILL BUILDING, WASHINGTON, D. C. COPIES OF ANY PATENT WITH DRAWINGS WILL BE SENT AT COST, NAMELY: TEN CENTS FOR EACH COPY. ANY INFORMATION AND ADVICE IN REGARD TO PATENTS WILL BE GLADLY GIVEN. ADDRESS ALL COMMUNICATIONS TO THE EDITOR.

THE INVENTOR'S DUTY TO HIMSELF AND TO THE PUBLIC.

IT IS VERY seldom that the inventor, in working over the creation of his inventive thought and perfecting his idea or machine, gives any thought to his position and duties, both to himself and to the public. As a rule, he is inspired by one of two motives, either to accomplish great good for humanity or to line his own pocketbook. And it is equally true that he may be influenced by both of these motives at one time, they preserving a just equilibrium.

Following natural laws, probably the inventor's first duty is to himself. At the very moment his invention has reached such an embryonic stage that he has a thorough conception of it, he should inform himself thoroughly of the state of the art before him. It is a fact that the industrial world is fifty years behind the world of the inventors. Thousands of devices absolutely unknown to artisans and to manufacturers are old and well known to the examining corps of our Patent Office. It is absolutely necessary that an inventor should avail himself of this knowledge by seeking the advice of a competent Washington patent attorney and informing himself of the state of the art. This, in many cases, will save years of labor in perfecting and money spent in experimenting.

The inventor's duty to the public is to so perfect his invention and reduce it to its simplest mechanical principles that there is nothing left for succeeding inventors to improve and to extend the monopoly of the patent right. It is eminently fair that the first inventor should have this monopoly for seventeen years; it is also just that the public should have the untrammelled use at the expiration of that period. Therefore, it is the inventor's duty to so clothe his own monopoly that none others shall follow. This duty also enjoins upon him the selection of the ablest and most competent patent lawyers at his command, for they alone can aid him in the thorough performance of this obligation.

576,260. HOLLOW BUILDING BLOCK AND MACHINE FOR MAKING SAME. Edward G. Durant, Pasadena, Cal. Filed Feb. 14, 1895. Serial No. 538,318. (No model.)

Claim.—1. An open-ended hollow building block of rectangular form provided with perforations in its upper and lower faces or walls, forming vertical passages through the block, said perforations being located midway between a transverse central line and the ends of the upper and lower faces of said block, substantially as shown and described.

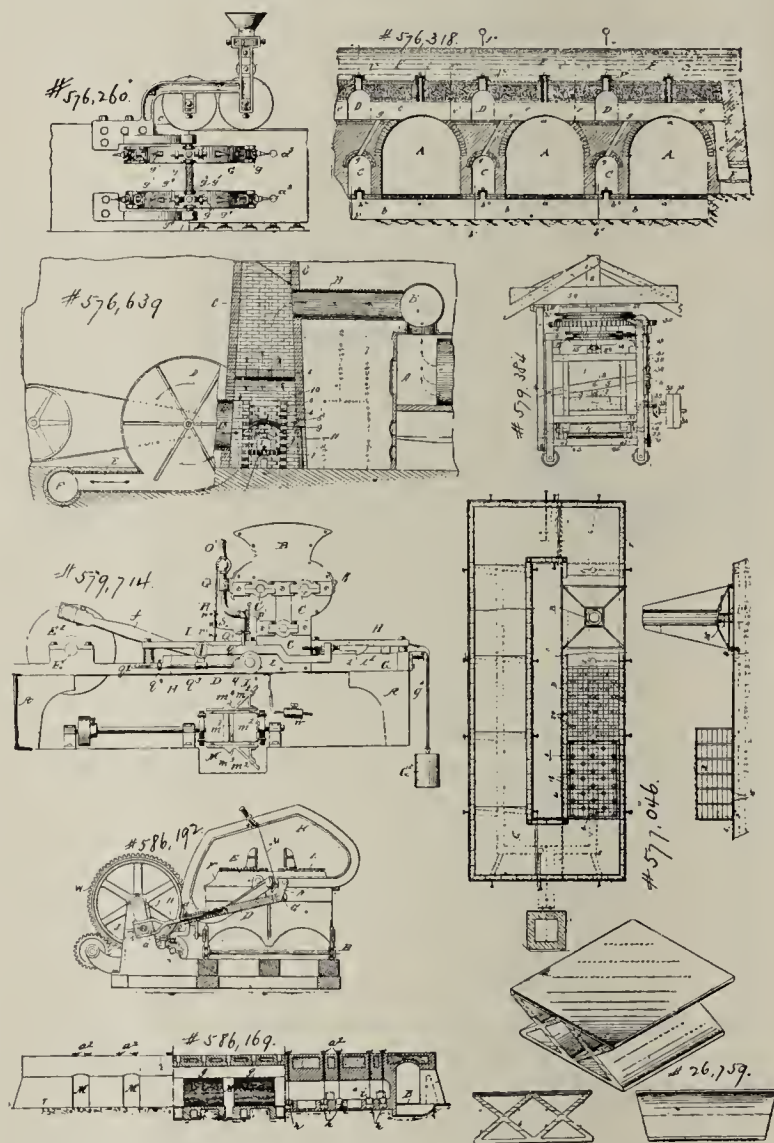
576,318. BRICK KILN. Charles Klose, Doniphan, Neb., and Alois Klose, Robesonia, Pa. Filed Feb. 27, 1896. Serial No. 581,048. (No model.)

Claim.—1. The combination of a series of arched chambers, each chamber being provided with crown openings and floor openings, longitudinal bottom flues connecting the floor openings of the different chambers, longitudinal caloriducts extending above the crowns of said chambers and communicating therewith through said crown openings, register vaults between said chambers provided with fuel openings at the bottom for use in bottom firing, said openings establishing communication

with the longitudinal bottom flues, transverse draft flues located above the register vaults, a main smoke flue extending along the rear ends of the transverse draft flues, and dampers connecting said transverse draft flues with the main smoke flue, substantially as set forth.

576,639. BRICK DRIER. Bernard F. Weber, Chicago, Ill. Filed Nov. 1, 1895. Serial No. 567,605. (No model.)

Claim.—In an apparatus of the kind specified, a chimney provided with a damper above the point of entry of the gaseous products of combustion, an arch below said point of entry, openings at the sides of said arch, a furnace below said arch comprising four perforated walls of brick, a grate consisting of brick with interstices between the same, a perforated arch



above said grate, and a hydro-carbon burner between said grate and said arch to heat said bricks to a high degree, and means for drawing said gaseous products of combustion through said interstices of said furnace to superheat said gases and force them into a drying chamber, substantially as described.

577,046. CONTINUOUS KILN. Friedrich D. T. Lehmann, Chicago, Ill., assignor of one-half to Peter N. Kohlsaat, same place. Filed June 10, 1895. Serial No. 552,351. (No model.)

Claim.—1. In a kiln having a floor and removable walls and chimney or stack, a flue situated beneath said floor, openings in said floor with which said flue communicates, and dampers controlling said openings, substantially as described.

2. In a kiln, the side walls and covering, and a yielding joint between said side walls and covering, consisting of a connecting piece or channel bar, with its edges resting on said parts, substantially as described.

3. In a kiln, the side walls and covering having grooves near their edges, and a channel bar or connecting piece, having its edges resting in said grooves, substantially as described.

4. In a continuous kiln, a floor, a flue below said floor, a plurality of openings in said floor communicating with said flue, removable walls and covering for said kiln, a stack or chimney, and means for establishing communication between said flue and stack or chimney, substantially as described.

579,384. BRICK MACHINE. William E. Damon, Pomona, Cal. Filed April 21, 1896. Serial No. 588,514. (No model.)

Claim.—1. In a brick machine the combination of a clay receiver, a plunger, a lever for raising the plunger, a wheel, means for operating the wheel, trip mechanism in connection with the wheel, a flexible connection between the trip mechanism and plunger for forcing the plunger downward, and a like wheel, trip mechanism and connection for raising and dropping the plunger, substantially as set forth.

2. In a brick machine the combination of a clay receiver, a plunger, a lever for raising the plunger, upper and lower wheels supported on the machine, trip mechanism in connection with said wheels, and a flexible connection between the trip mechanism and the lever, one of said wheels being of greater diameter than the other wheel, substantially as set forth.

3. In a brick machine the combination of a clay receiver, a plunger, a lever for raising the plunger, upper and lower wheels supported on the machine, trip mechanism in connection with said wheels and a flexible connection between the trip mechanism and the lever, said trip mechanism being operated at different periods in the revolution of the wheels to which they are connected, substantially as set forth.

4. In a brick machine the combination of a clay receiver, a plunger, upper and lower trip wheels, suitable trip mechanism, means for connecting the trip mechanism with the plunger, a master wheel located on the same support as the trip wheels, and suitable gearing in connection with the master wheel for revolving the same, substantially as set forth.

579,420. COMPOSITION OF MATTER FOR BRICKS. John Brock, Philadelphia, Pa. Filed June 22, 1896. Serial No. 596,514. (No specimens.)

579,714. BRICKMAKING MACHINE. John J. Levi, New Richmond, O., assignor of three-fourth to Alfred A. Levi and John James Levi, Jr., same place, and H. M. Dalton, Cincinnati, O. Filed April 19, 1894. Serial No. 508,122. (No model.)

Claim.—1. A grinder for a brick machine, including among its members a plurality of parallel shafts, each provided with a series of parallel circular toothed disks, disposed angularly to the shaft, the disks of each shaft being disposed at a different opposite angle to that of the disks of an adjacent shaft, the disks of one shaft registering with the space between the disks of an adjacent shaft, substantially as described.

2. A brick molding and shaping machine, having among its members a pair of molding slides, a stationary table forming a part of the mold, an automatically acting dumping table, and means for moving the pressed brick from the stationary table on to the dumping table, substantially as described.

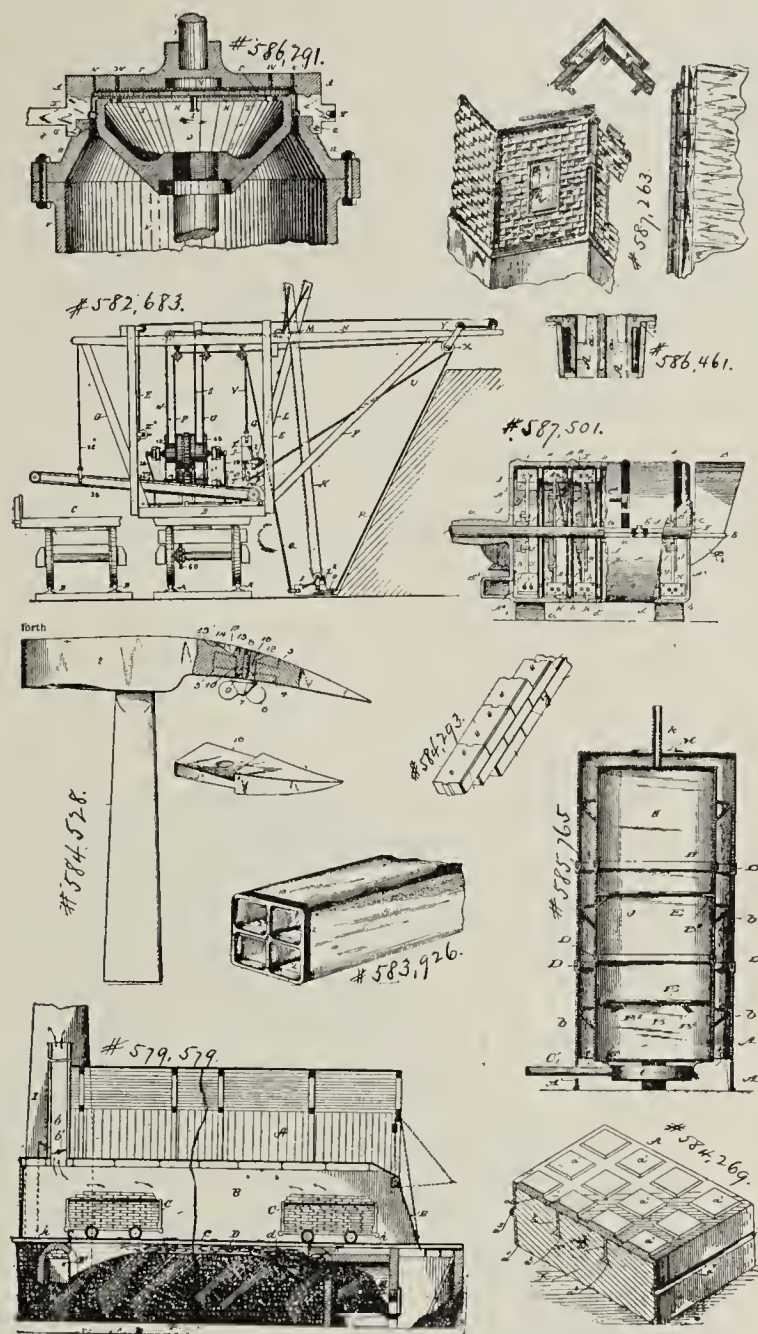
3. A brick molding and shaping machine, having a pair of molding slides forming opposite sides of the molds, folding mold ends, a stationary table forming a part of the mold, an automatically acting dumping table, means for moving the pressed brick on to the dumping table and means adjacent to the dumping table for permitting the opening of the folding mold ends, substantially as described.

586,169. KILN FOR BAKING OR FIRING EARTHENWARE. Charles Dubois D'Enghien, Alphonse Dubois D'Enghien, Leon Dubois D'Enghien and Silvain Dubois D'Enghien, Henmyeres, Belgium. Filed Nov. 16, 1895. Serial No. 569,216. (No model.) Patented in Belgium Nov. 7, 1894, No. 112,576, and Feb. 25, 1895, No. 111,290; in England

Nov. 14, 1894, No. 22,008, and April 4, 1895, No. 7,914, and in France Nov. 15, 1894, No. 217,063.

Claim.—1. In a continuous gallery kiln divided into spaces by fuel grates, a main flue common to all said spaces, flues opening into said spaces in front of and above said grates at the outer end thereof, said flues connected with the main flue, and suitable dampers for controlling the flow of the products of combustion, substantially as and for the purposes set forth.

2. In a continuous gallery kiln divided into spaces by fuel grates, an ash pit under such grates open to the atmosphere outside the kiln walls, a main draft flue, a flue connecting the ash pit with said main flue, and means for directing the products of combustion from above the grate into the open end of



said ash pit, of auxiliary flues opening at one end into the gallery spaces in front of and at the outer end of the grates, said auxiliary flues in communication with the main flue, and suitable dampers for controlling the flow of said products of combustion to such main flue, substantially as and for the purposes set forth.

3. In a continuous gallery kiln, a single partition wall separating the galleries running lengthwise of the kiln and closing the inner side of the end connecting spaces, fuel grates dividing said galleries and end spaces into kiln spaces, an ash pit below each fuel grate accessible, respectively, from the sides and ends of the kiln, and a main draft flue formed in said partition wall, in combination with flues connecting the ash pits with said main flue, means for directing the products of combustion from above the grate directly into the ash pits at the outer end thereof, auxiliary flues for connecting the gallery

spaces directly with the main flue, and suitable dampers for controlling the flow of the products of combustion from the aforementioned flues to the main flue, substantially as and for the purpose set forth.

4. A continuous gallery kiln divided into spaces by fuel grates, and having parallel longitudinal channels formed in the side walls of said spaces, substantially as and for the purpose set forth.

586,192. BRICK OR TILE CUTTING MACHINE. John O. Ludlam and John L. McKittrick, Canton, O. Filed May 26, 1896. Renewed April 29, 1897. Serial No. 634,461. (No model.)

Claim.—1. In a crock press of the class designated, the combination with the mandrel of the press of a concave-convex plate, with the concave face toward the bottom of the mandrel and its edge in contact therewith, and a sliding bolt arranged to permit said plate to retain its normal shape until compressed by force from its opposite.

582,683. EXCAVATING MACHINE. Morton E. Pugh, Chicago, Ill. Filed June 16, 1896. Serial No. 595,794. (No model.)

Claim.—1. In an excavating machine the combination of an excavating dipper pivoted between its ends upon a handle, a fixed overhead boom secured to the framework of a traveling platform, said boom being provided with an opening through which the handle passes, a cable secured to the front end of the dipper and passing over a trolley pulley on said boom and then to a winding drum, a second cable attached to the rear of the dipper and passing by suitable pulleys to a second winding drum, a third cable secured to the handle above the boom and leading to a third winding drum, with power mechanism for operating and controlling the movement of the said drums in either direction, substantially as described.

586,461. BRICK DIE. Clarence M. Steele, Statesville, N. C. Filed Oct. 1, 1896. Serial No. 607,570. (No model.)

Claim.—1. A brick die composed of die sections, a chambered partition located between the sections and forming one of the sides of the die orifices, and the casing or shell, a steam chamber surrounding said sections and located between the casing or shell and the sections being provided within the casing or shell and communicating with the chamber in the partition, substantially as shown and described.

587,263. TILE WORK. Dick N. Lanyon, Chicago, Ill. Filed May 20, 1896. Renewed June 12, 1897. Serial No. 640,571. (No model.)

Claim.—1. In tile work, the combination with the walls of buildings or other structures, and facing tile applied to the said walls without securing a finished joint at the angles, of tiling fitted to the angles and deflected between its edges and made hollow on the side facing the wall, and having its edge portions overlapping and cemented to the adjacent ends of the body or facing tile without interlocking therewith, substantially as set forth.

587,501. ROTARY PULVERIZING MILL. Charles M. Day, Brooklyn, N. Y. Filed Dec. 4, 1895. Serial No. 571,043. (No model.)

Claim.—1. In a pulverizing mill, the cylindrical shell, having spiral or helically curved ribs projecting inward therefrom, with their working faces inclined toward the inlet end of the mill, in combination with a rotary shaft, radial arms secured thereto and blades connected to said arms, with their outer edges adjacent to said ribs, and their working faces at an angle toward the working faces of the ribs, which are inclined backward toward the inlet end of the mill, whereby the blades will exert a shearing action, and work against the ribs to convey the heavier and larger particles backward and repeatedly subject them to the pulverizing and shearing action, substantially as described.

582,942. CHROME BRICK. Niven McConnell, Munhall, Pa. Filed July 8, 1896. Serial No. 598,498. (No specimens.)

Claim.—A burned brick composed of a mixture of chrome ore and about 2 per cent., not more than 3 per cent., of alkali binding material.

583,926. CONDUIT. John T. McRoy, Chicago, Ill. Filed March 22, 1897. Serial No. 628,644. (No model.)

Claim.—In an underground conduit, the combination with a series of sections laid end to end and each provided with a plurality of longitudinal ducts and dowel openings formed in the ends of the intersecting partition walls of said ducts, of metallic dowel pins arranged in the dowel openings at the adjacent ends of said sections, and collars arranged on said dowel pins between the ends of the latter, substantially as described and for the purpose specified.

584,269. COMBINATION PAVING BLOCK AND SYSTEM OF PAVING. William H. Northcutt, Troy, O. Filed Aug. 11, 1896. Serial No. 602,438. (No model.)

Claim.—1. A paving block having a metallic shell, comprising a top of raised or roughened design, formed with internal depending locking flanges, four sides or walls provided on the inside with continuous tongues on two sides and continuous grooves on two sides or walls, open bottom with continuous inwardly projecting flange around its four walls, all formed integral, and a hard, heavy interior filling, substantially as set forth and described.

584,293. BRICK. John Quigley, Blossburg, Pa. Filed July 29, 1896. Serial No. 600,973. (No model.)

Claim.—1. As an improved article of manufacture, a brick provided with projections upon its tops and corresponding cavities upon its bottom, a cavity upon one side, and a corresponding projection upon the other side, a vertical tongue upon one end, and a corresponding vertical groove upon the other end, substantially as set forth.

2. A brick having a vertical shoulder and a horizontal shoulder, projections upon its top, and corresponding cavities in its bottom, a vertical tongue upon one end, and a corresponding vertical groove upon the other end, substantially as set forth.

3. An outside brick having projections upon its top, corresponding cavities upon its bottom, a cavity upon the inner side adapted to receive a corresponding projection of an inside brick, a vertical tongue upon one end, and a corresponding groove upon the other end.

584,528. BRICKMASON'S HAMMER. Henry C. Stallings, Idaho Falls, Ida. Filed Nov. 10, 1896. Serial No. 611,655. (No model.)

Claim.—1. A hammer provided with a jaw 4 having the orifice 9, and the jaw 5 having the circular countersunk recess 15, the inner faces of said jaws being arranged at an angle to form a dovetail recess, in combination with the interchangeable point having the fourth.

585,765. CHINA KILN. George Jeffery, Portland, Ore. Filed Feb. 11, 1897. Serial No. 622,920. (No model.)

Claim.—In a china kiln, the combination with the outer sections having annular recessed rims designed to receive a superimposed section, the cap section having an aperture, M, of the inner series of superimposed sections, the brackets supporting same, the tube k secured to the upper of the inner sections K and extending through the aperture M, of the lamp C supported under the lower of the inner sections, substantially as shown and described.

579,579. BRICK DRIER. Theodore L. Holbrook and Charles Schu, Washington, D. C. Filed April 11, 1896. Serial No. 587,195. (No model.)

Claim.—1. In a drier for bricks, the combination with a drying chamber of a series of furnaces, a horizontal distributing flue extending along one side of said chamber and with which each of the furnaces communicates, a cross flue parallel to the distributing flue on the opposite side of said chamber and having at one end a chimney, and a series of heating flues extending from the distributing flue to the cross flue, the tops of said flues being of heat radiating material, and separating the flues from the drying chamber, substantially as described.

2. In a drier for bricks, the combination with the drying chamber of a furnace, a horizontal distributing flue extending along one side of said chamber, a cross flue parallel to the dis-

tributing flue on the opposite side of said chamber and having at one end a chimney, and a series of heating flues extending from the distributing flue to the cross flue, the tops of said flues being formed of concave-convex removable metallic covers, whereby direct access can be had to the flues from the chamber, substantially as described.

3. In a drier for bricks, the combination with a drying chamber of a furnace, a horizontal distributing flue extending along one side of said chamber, a cross flue parallel to the distributing flue on the opposite side of said chamber and having at one end a chimney, and a series of heating flues extending from the distributing flue to the cross flue, the discharge openings of the heating flues being of different dimensions, increasing in size from that nearest the chimney to that furthest therefrom, whereby uniformity of draft and heating effect in the several flues is maintained, substantially as described.

1797. STEUBENVILLE, OHIO. 1897.

THE SNUG LITTLE CITY of Steubenville, O., has made a century run. The event was celebrated the week of Aug. 23, during which time the citizens gave themselves up to jollifying and the entertainment of visitors, who came from the surrounding country by thousands. The streets were a mass of bunting, through which peeped numerous lithos and drawings of her noted men, who have added luster to the name of Ohio, and the Nation as well.

Steubenville is an extensive manufacturing center, her shipping facilities by rail and the Ohio river being exceptionally advantageous. There are coal mines in the immediate vicinity, offering cheap fuel, so there is little wonder that nearly all industries are well represented there. In the clay line there is an extensive pottery, great sewer pipe factories and a fire clay factory, which makes a specialty of pots for glassmaking, the extensive machine shops of James Means & Co., manufacturers of all kinds of clayworking machinery, and the usual building

brick plants, including that of our old friend, Geo. J. Fickes, who, though an exceptionally quiet and modest gentleman, has a host of friends among the brickmakers of the Nation, whom he has met at the N. B. M. A. Conventions, of which he is a regular attendant.

One of the great events of the gala week was a grand industrial parade, in which most of the manufacturers took part, displaying their products and trade symbols on gayly bedecked wagons and cars, fitted up for the occasion.

One of the best displays made was that of the Steubenville Pottery, the accompanying view of which, while it does not do full justice to the exhibit, will give the readers an idea of the character of this part of the celebration. As our picture shows, they make a large variety of decorated china, their chief product being dinner and toilet sets of porcelain, granite and semi-vitreous Canton china of a superior quality. Though less than twenty years old, the pottery has gained a national reputation, its product being shipped into every State of the Union. When running full handed they employ over two hundred people, every one of whom, they say, are good American citizens. They had been running on short time for a year or more prior to the passage of the tariff bill, when, the Secretary informs us, their trade at once picked up, and they now have orders enough to keep them going full handed the balance of the year. Prices still rule low, but this trouble, too, they think, will grow less as times get better.

HISTORY REPEATS ITSELF.

Panics come in regular cycles. From the dates on which they have occurred, viz., 1819, 1837, 1848, 1857, 1869, 1873, 1884, 1893, it may be seen that they follow the example of the seventeen-year locust, not only as to time, but in their effects upon the country. As a usual thing, they are followed by gradual recovery, good times, "booming times," and then, alas! by the overspeculation which ends in another panic.—Ex.



STEUBENVILLE'S INDUSTRIAL PARADE.—A Good Brick Street.

Written for the Clay-Worker.

MODERN AMERICAN FRONT BRICK.



PEAKING OF FRONT BRICK in general would involve a theme so broad and vast, so intimately connected with the rise and fall of nations with national styles of architecture, that the writer could not dare to attempt the task. In arriving at the above title the subject, though narrowed down, is still a very large one. In this paper the writer will endeavor to show briefly, from the standpoint of the brickmaker, the growth of the American front brick, its part in modern architecture, its latest variations and its future. For our purpose we will be obliged to consider as modern front brick such brick which obtain their final shape in a mechanical pressing apparatus, be it a repress, a dry or a semi-dry press, for really the advent of our front brick was coincident with the production of the first pressed brick. Among the pioneers of the latter we find the Philadelphia brick occupying a prominent place. Molded by hand or soft mud machine, repressed on hand represses and burned in clamps, they were of a beautiful red, so well beloved by the Philadelphians. Far and wide spread the fame of the Quaker City brick, and many were the buildings whose walls were put up with them. In the Central States the Zanesville brick about equaled the Philadelphia in reputation, and were recognized as standard brick in point of beauty of color and finish.

But the introduction of pressed brick was not an easy matter, and many prejudices had to be overcome. Both the makers and users of common brick raised objections to the use of "fronts," claiming that the latter would not set properly in mortar owing to their smoothness; that they could not be cut, and that their weather resisting quality was inferior to that of the mud brick. As is the case with all innovations of merit, opposition did not prevent the rapid introduction of pressed brick; their manufacture was commenced all over the country, and, instead of a luxury which the rich only could afford, they became a commodity. At the same time new processes were being considered, and dry and semi-dry brick presses appeared on the market. The path of the new methods, proposing to shape perfect brick out of semi-dry or damp clay dust, was not an easy one, for the builders of the first presses, though convinced of the feasibility of the new method, lacked yet the complete control over it. Numerous were the difficulties which arose, due partly to mechanical deficiencies, partly to the wrong application of the dry pressing principle. Not until the fact was recognized that more than one distinct pressure is required to make a sound brick and the mechanism was simplified did the success of the dry method seem an assured fact. Meanwhile, during the introductory period, the opposition, fed by failures which are unavoidable during the infant stage of a new process, was very fierce.

But as the difficulties were being overcome, the press applying a repeated pressure to the brick, with a proper ratio of the plunger and charger movements, failures became less frequent. At the same time experience pointed out the advantages of storing the clay, pulverizing and screening it as fine as possible, and feeding it to the machines from proper bins in the right degree of moistness. With the advent of steamers it also became possible to work clays and shales which were before considered as not fit for the dry press process. Finally, the latter not only became a formidable rival to the repress method, but even excelled it vastly. The high-class front brick, enjoying the highest reputation for evenness of color and beauty of shape, were dry pressed brick, and the demand for such brick increased constantly, till it reached the dimensions it attained in 1892. At that time the repressed brick were not "in it," so to speak.

—The Present Status of the Two Processes.—

What are the conditions to-day? The relative positions of

the dry pressed and repressed front brick have changed considerably. No longer is the former considered superior to the latter. We may almost venture to say that the reverse is the case. How is this to be explained? Has the dry press brick deteriorated in quality, in beauty of shape and color? The quality of the brick has not changed, but the users are judging it from a different standpoint. Beauty of shape and color are not the only criterions by which a front brick is at present judged as to its quality, but the degree of vitrification or its equivalent, the capacity to absorb water, enters as an important, often determinative, factor. This very point has grown to be of the utmost importance to the manufacturers of front brick, because it enters into the vital characteristics of the dry press process, in which it differs from the repress method.

—The Two Processes Compared.—

It is hardly necessary to state that, strictly speaking, there is no such a thing as dry pressing, for the clay as it comes to the press averages at least 4 per cent. of moisture. Perfectly dry clay could not be made into brick under the pressure of an ordinary press. It is evident that it is a certain degree of plasticity which causes the particles of clay to adhere under pressure and form the bricks. But when we examine a brick as it comes from the dry press we can see every particle as a distinct body, but we cannot observe any trace of a cell structure, of a plastic bond. On the other hand, in a repressed brick the bond becomes very evident. We see a clay body in which the particles have been so closely united by the agency of water that we can observe no break excepting air spaces, grit and lines of structure caused by the flow of the clay. Hence we have to deal with two entirely different kinds of structure. The one is void of cell structure, the slightly moist particles being made to cohere by means of pressure; the other is the characteristic clay structure, showing a well defined plastic bond, in which the particles are so intimately united that they cannot any longer be distinguished. Up to the point of vitrification burning does not alter these conditions. While, owing to the lack of an intimate union, the dry pressed brick readily absorbs moisture through the spaces between the clay particles, the repressed brick continues to grow denser, even before vitrification, and consequently it absorbs much less water than a dry pressed brick of the same clay and burned at the same temperature. Vitrification alone unites the particles of a brick of the latter kind and produces a non-absorbent body. If vitrified, a dry pressed brick, in point of density and homogeneity, which are equal to crushing strength, is far superior to the plastic kind, not considering the former's beauty of shape and finish.

But the difficulty is in vitrifying a dry pressed brick. Not only does it require a higher heat to vitrify them than it does for plastic brick, but also the questions of retaining the shape and color have to be considered. While a plastic brick may be burned impervious enough without actually entering the state of complete vitrification, nothing short of it will render the second kind non-absorbent. Vitrification, as is well known, produces various changes in color. Red burning clays, if poor in alumina and lime, become brown and even black; clays very rich in lime are changed to dark green, and thus a great variety of colors may be produced, which again, according to the degree of vitrification, give countless shades and off shades, as many a pressed-brick maker knows to his sorrow.

In burning any clay up to incipient vitrification a reasonable range of shades may be expected, but if the same material is completely vitrified the shades often become too numerous for profit. This, perhaps, explains the difficulty experienced in rendering dry press brick non-absorbent. There are clays which can be vitrified without much trouble and change of color, materials low in lime and alumina and high in precipitated iron, like the Bedford shale of northern Ohio, but these are few and far between. Even with white and buff burning clays, with which vitrification seems only a question of heat, but not of color, it frequently causes to appear the fine concretionary iron in a very unpleasant manner. Thus, as far as the question of

imperviousness is concerned, the plastic brick seem to have the advantage.

But, we may ask, is this demand for impervious brick—that is, brick perfectly non-absorbent—really just? Are not architects going too far in that direction? We grant that for the sooty atmosphere of our cities front brick must be as non-absorbent as possible. But why should uniformity of color and perfection of shape be sacrificed to impervious surfaces entirely? It seems that a dry pressed brick, having reached incipient vitrification, but still showing some absorption of water on the surface, should not be rejected on that account. The writer knows of a case where the architect of a large building to be erected rejected a dry pressed brick, beautiful in color and shape, and vitrified, simply because it still absorbed some water on the surface. Some may suggest changing from the dry press to the plastic clay method, but there seems little cause for that, for dry press brick possess architectural advantages in regard to color and shape which are too important to be disregarded. However, it might be profitable for some dry press plants to add plastic clay outfits in order to meet the demand for impervious brick without the difficulties which attend the manufacture of non-absorbent dry press brick.

—Impervious Dry Pressed Brick.—

That it is difficult to manufacture non-absorbent dry pressed brick will be conceded by all who are engaged in the business, but this does not mean that it is an impossible task. The main point at issue is the color question, for, if well vitrified, non-absorbent brick can be made in a good, salable color, they can certainly be manufactured on a profitable basis with due care and foresight. To start with, in the production of this grade of brick special attention must be devoted to two stages in the making of the green brick, viz., the grinding and screening and steaming. That is to say, the clay must be reduced to as fine a grain as it is possible to do on a profitable scale, and it must be made as moist as the press will work it. By whatever means this may be accomplished is indifferent to the quality of the goods, but it must be done in order to insure satisfactory results. The question of curing the clay likewise plays not an insignificant role, and it is evident that the more the clay structure is unlocked the better will it eventually be open to the vitrifying action of the heat. Though storing the clay is considered by some as unnecessary and old-fashioned, it is a practice which pays in the end.

In regard to burning, it is not only a question of raising sufficient heat, but also one of careful firing. In burning red brick oxidizing fire should prevail throughout the burn, while white and buff brick demand an alternate oxidizing and reducing atmosphere, keeping up the former during the last twenty-four hours if clear colors are wanted. Of course, the important part is to stop firing at the right time, when the right degree of vitrification has been attained. This seems an easy thing to say, but it is not as easy to do. Close shrinkage measurements, regular and frequent firing, with no "overdosing," clean fires, and last, but not least, the use of the Seger pyrometric cones, are helps essential to success. The latter will be found of great assistance in referring the required degree of vitrification to a definite point.

The white and buff burning clays, owing to their refractory qualities, require a very high temperature for complete vitrification, and if a cheap flux could be had which would not interfere with the color results much of the difficulty would be taken away. But outside of light burning, feldspathic clays, vitrifying at a lower temperature than the ordinary white and buff clay, there is only one flux—lime—which could be used economically. The kind of low burning clay alluded to above is not very common, and its use in most cases would not be justified from the financial standpoint. But lime, in the shape of ground limestone or any other cheap form, could very often be employed as a fluxing ingredient in the No. 2 fire clays, which are always low in lime. Economic reasons will restrict its use to limits within which its employment is safe. Where peculiar

gray and spotted shades are desired ordinary furnace slag gives a most excellent and safe flux, by means of which perfectly impervious brick are produced.

—Flashed Brick.—

A type of front brick very much in favor at the present time is the flashed kind, brick with an impervious surface, in color from old gold to reddish brown. They are made from No. 2 fire clays, and, under ordinary conditions, burn buff. But in burning they are made to undergo a process of fire flashing, which produces the often very beautiful coating on the surface. The brick are set flat, leaving the surfaces exposed to the fire, and, as a rule, they are placed on top of the regular stock brick. During the last stage of the burn, when the kiln has reached its highest heat, a heavy reducing atmosphere is produced by firing heavy charges of fuel and almost closing the dampers. This strong reduction has a powerful effect on the brick; the iron is reduced to the ferrous form, and immediately combines with silica to produce ferrous silicate, which, in fusing, draws all the fluxes within reach into action, and results in the impervious coating known as "flash." According to the length of time and intensity of reduction, the shade varies from light to dark. As a rule, the flashing is done during the last three or four hours. There are clays which "flash" even under the ordinary reducing periods of a burn, and these, unless care is taken to have a continually oxidizing atmosphere, produce this effect when it is not wanted. If it is intended to make flashed brick a regular feature of the output, the reducing operation should be conducted systematically by commencing to "flash" at always the same heat, as determined by cones, by continuing the reduction the same length of time, by firing the same quantity of fuel and closing the dampers as much as has been found best for satisfactory results, every time. Theoretically, a gas burette, determining the degree of reduction, should be of assistance in controlling the reducing process. For flashing purposes exclusively small kilns of about 20,000 capacity are the best.

—The Influence of the Kiln Gases Upon the Color of the Ware.—

Mention has been made repeatedly of reducing and oxidizing atmospheres and some of their effects have been alluded to. It will, perhaps, not be out of place to call attention to the importance of the oxidizing and reducing conditions of the kiln gases. This is a subject which often is not considered as it should be. The ordinary kiln condition of our down-draft kilns is, as a rule, oxidizing, excepting the short periods after each firing; that is, oxygen, as a constituent of air and carbonic acid, is present in excess over the quantity necessary for the combustion of the fuel. Reducing atmosphere exists only when there is not sufficient oxygen for complete combustion. In the latter case the carbon of the fuel cannot find enough oxygen to saturate itself, and form carbonic acid gas. But as the affinity of carbon for oxygen is very great it sizes the latter wherever it can get it. Under oxidizing conditions the union of oxygen and carbon produces heat, but exerts no particular influence upon the natural constitution of the clay. The case is entirely different under reducing conditions; here the carbon, hungry for oxygen, attacks the clay in order to obtain its food. As we all know, clay almost always contains iron in the form of ferric oxide, which must serve as a source of oxygen for the carbon. The result is that the ferric oxide, deprived of part of its oxygen, has been changed to another compound—ferrous oxide. This difference is manifested by the color, for while the ferric compound gives rise to a red coloration, the ferrous oxide produces brown or black. Thus the reducing gases have changed the color of the ware, and if they were to be maintained throughout the burn and part of the time of cooling the dark color would be retained. But, on the other hand, oxidizing gases will reconvert the ferrous oxide to the red, ferric compound. And this is what actually takes place if the temperature is not high enough to produce vitrification. But, supposing the latter case, the action taking place will be somewhat different. The ferric oxide is, as before, reduced to the ferrous form, but as the heat

is high enough to awaken the activity of silica, this powerful acid will size the ferrous iron and form with it a ferrous silicate, owing to the fact that the ferrous compound is best suited to combine to a silicate. The ferrous silicate, like the ferrous oxide, is brown or black, but, unlike the former, it is a stable compound and cannot be reoxidized, for the silica will not loosen its grasp upon the base. This action takes place very often, and in many cases it affects the color of the clay ware very radically. Taking, for instance, an ordinary red burning brick clay and burning it in a kiln with bright fire and plenty of draft throughout the burn, red brick will be produced. On the other hand, this same clay, burned at the same temperature, in the same kiln, but with a smoky flame and reduced draft, will certainly produce a dark color, brown, or even black. Vitrification is greatly assisted by the reducing fire, and clay will vitrify much sooner under the influence of smoky kiln gases than it would with continued oxidizing conditions. But not always are the conditions completely oxidizing or decidedly reducing; sometimes the reducing gases are not so prominent, and in this case only part of the iron is reduced, and hence we have brownish tints and other shades in endless variations. From what has been said it is evident that if we had complete control over the composition of the kiln gases the color problem of front brick would be almost solved, and the time is coming when we will really be able to do this. In a subsequent paper another practical instance of the effect of reducing gases will be given.

AMERICUS.

THE NEW YORK MARKET.



WHEN WILL the brickyards stop molding? is the question frequently asked. The manufacturer is like "Br'er Rabbit;" "he say nothing," but he keeps up a thinking that is very trying to his brain. It is "not what he is here for," but what is he making brick for? Will the market react at all in his favor? The wise man who said, "All things come to him who waits," seems to have forgotten that the brickmaker has been waiting, and is still waiting, for the turn of the tide to help increase his "pile" in the bank (national), instead of decreasing his clay bank without any return, as has been the case for several years.

"Faithful unto death" is chiseled on many a piece of granite or marble. The brickmaker of to-day, as he lays aside the cares of this world in the sleep that knows no waking, should have engraved on his monument (that is, if he has enough left to buy one), "Faithfully he worked in the hope that he would be recompensed for his labor."

If there is any greater strain that can be put on the human form than to carry on business when the returns fail to meet the cost, as well as being short of ready money, it has not been heard of. With but few exceptions capital is scarce, but how scarce may be judged by the following remark of a boss in conversation about wet weather: He said it was a benefit, as it did not take so much on pay day. One would say that was a case that would not last long. Of one thing we can be certain: that man must do lots of brain work to make both ends meet. What will the harvest be to him if the price of brick remains low?

Dollar wheat has no charms for him; rather the other way, as the cost of horse feed is more. The flour which he uses in his family will cost him \$7 per barrel; at this time last season \$5 per barrel would have been high, and the price of brick way down. Verily, his lot is hard.

The year 1897 will no doubt be one long remembered as a wet season. Last month I said that July had been very wet. Of the month of August to say that sunshine was not in it with the rain is putting it mildly. Oh, how it did rain! It seemed as if there would have to be clear weather, as there would be no water left in the clouds to fall. In a day or two it would repeat the programme on the same scale.

One of the yards has wheeled off in the past two months five

pits of green brick, washed so bad that it would not pay to put them in the pit, as well as some others which were washed in the hacks and fell down. Hacks doubled; others were wheeled off and piled under the shed to get more up. To-day, the 30th, is the fourth consecutive day of sunshine, the longest period this month without rain. We have in this town a weather prophet, Andrew Jackson DeVoe, who predicted frost on the 28th of August, but it failed to come. All the same, the katydids first tuned up Aug. 1, and that means frost in six weeks after, or about the middle of September.

—Stop Short.—

In the June number mention was made of getting ready to mold in three days. On one of the yards, about two weeks ago, the boss wanted one of the men to go and work in the bank. He wouldn't do it. He told another, with the same reply. When the pit was out, he told the men that would be the last pit molded this year, as he had three green kilns open. He closed one up and burned it, and in a day or two the other will be out. The third he will let stand till next season, when he will fill it out. These two men were the cause of others being thrown out of work, with no prospects of getting any other situations. To judge from the condition of kilns under other sheds, it will be but a few days before others will blow the whistle for the last time this year.

A general stop of all, or a large percentage, of the yards is being talked of. A typewritten letter has been sent to each manufacturer on tide water, signed by Farrier & Golden, of Catskill, N. Y. It argues that overproduction has been or is the cause of the low rates, and, in their opinion, the only thing to help the trade this season is to stop making. They say if 90 per cent. of the yards will agree to close on the 18th of September the market will pick up. Why they chose such a high percentage and not make it all none but themselves can tell. If that number of yards would sign it would be one of the greatest surprises that the trade has had in many a day. The brickmakers will not pay any attention to it, not even replying to the request, and from information at hand the Haverstraw men will not sign, not because they do not want to see such a result, but as in the past and in all other movements of the kind, either to stop in the fall or to begin late in the spring, he will say: "I will wait and see if the other fellow will sign; if he does, I will go on and reap a benefit at his expense."

—With Some an Excuse—

To get out of any movement after they enter it is always in order. The formation of the company a year ago for the sale of brick has afforded some instances of how a person will talk one way and act another. There is a case where one brickmaker is a stockholder, but has not sent a brick to the company for sale; he always places them in the hands of the commission men, which has been their cry for years. That is a problem I will not attempt to solve. Another case of late date: Parties who are also stockholders claim that they were not fairly dealt with, and say that they will not send in any more. It is only an excuse to get out, and why? They have been the most outspoken against the commission man, and were well pleased to go in the organization. Consistency is a jewel that few possess, brickmakers least of all. I am not opposed to the agents, for I know that if an angel should set up in the commission business some of the brickmakers would condemn him as not doing things on the square. Just so in these cases. If they would make open confession of the "why" they do not sustain the company of which they are stockholders it would be all right, but to raise some other cause is not on the square.

—Agents Versus Company—

Is somewhat like the fellow and his girl, who thought he would be all right if he had the field to himself. The agent claims that if he had the handling of the stock, as in times past, there would certainly be a line of better rates. He says that the company should advance the price and tells the brick men what he would do. Well, the brick men know what they did do in times past.

There does not seem to be any great defection from the company, although, if we are to believe what the commission men say and write, it is the company that is the means of keeping the price low. As the quantity of brick which goes to market is nearly equally divided between agent and company, would it not be good policy on the part of the commission men to just make one trial of asking more money, and hold them for that rate, and thereby show the shareholders, as well as their own clients, that they are trying to push up the price, and see if the other fellow will not follow suit or play a higher trump by asking more? Acts, not talk, will do more to convince the brick men of their sincerity toward higher rates than all "why don't the company do it?" The salesman for the company is one to whom no one in the trade of selling brick can give any points. He is one of the shrewdest men in that line, having learned the trade with his father, and after the latter's retirement the business was continued by him. The easiest and quickest way to convince all in the trade is to get more money for the article you sell than others; then customers will flock to you; but to keep selling so low and trying to place the blame on others is a slow way to assure the men you want to convince that you are a leader and not a follower.

—Real Estate in New York City—

Is the one spot that interests the maker of brick. The dullness or activity in it affect the trade. This year the hope was that there would be a marked increase in the erection of buildings, but, as in other seasons, the brickmaker will not run short of stock to fill all orders.

From Jan. 1, 1897, to Aug. 28, the number of buildings erected was 2,367; for the corresponding period of 1896, 2,327, or only forty more in 1897 than in 1896. The cost of same for 1897 was \$60,380,300 and for 1896 \$57,815,275, a difference in cost of \$2,565,025.

—A Comparison.—

For the week ending Aug. 28 there were filed in New York city permits for fifty-four buildings, to cost \$1,141,650; for the same period of 1896, forty-one buildings, to cost \$295,250—quite a difference. In Brooklyn, for the same length of time, 1897, ninety-four permits, to cost \$348,576; in 1896, thirty-six permits, to cost \$141,753. The cost goes to show that the use of brick in Brooklyn is not very large.

—High Building.—

If, in time to come, nature kicks up a disturbance and upsets some of the high office structures in New York city, it will be a hard matter for the pedestrians to get out of the way of brick, iron and stone which will be thrown as from a catapult. It seems that each year the architects plan something higher. At present there is in course of construction on Broadway the tallest office building in the world; when completed it will be thirty-one stories high. The first tier for the foundation is sixty feet below the street surface. What a picnic it would be for the brickmakers if all the walls were of brick in all those large buildings. The iron men can well say, "Iron is king; long live iron."

—Cut in Prices.—

As your correspondent from Quakerdom says, complaints seem to have become general in local trade. One would suppose that a good paying rate would be in vogue. How to explain the cause when no cause exists is difficult, unless it is that the manufacturers do not consult together and make a fixed rate. In this town a sewer is being built which will require nearly 2,000,000 brick. Some of the yards did not put in a bid; in fact, but three yards did bid. Before the sewer is completed it will be four miles from the yards. The bid that secured it was for \$4.90 per thousand, delivered. The gentleman who was successful did not want to deliver more than one-third of the brick, as he thinks he will get a better figure next spring in New Jersey. He allowed the next yard to send in the balance. What brick their own teams cannot haul they pay 75 cents per thousand to outside teams, which make four loads a day, or five thousand a day. Their own teamsters will have to do the

same. It will take them till 5 o'clock p. m. to get through. Now how will it be three or four months hence, with short days and a longer haul? What is there in it, as the brick have to run good? A lot of labor for a very little money. They could just as well have \$6 per thousand as the rate quoted.

—The Market—

Has all the supplies that the buyer wants, with a few barges left over, not to count the sailing vessels which are left. There were days when the yards did not mold; for fear the market might be short, they loaded barges.

Haverstraw has not been a heavy shipper, but up-rivers have come forward in good numbers. This part of Jersey is not sending to any extent. If the month of September is clear, so that they can turn out each working day, there will be freer shipment for room—if not for money. A month makes some difference in price, but, I am sorry to say, it is down hill.

New Jersey ordinary.....	\$3.50	@4.00
New Jersey good.....	4.12½	@4.25
Common hard ordinary.....	4.00	@4.12½
Common hard good.....	4.25	@4.37½
Common hard fine.....	4.50	
Special	4.50	@4.62½

So ends August. Will September be any better?

Hackensack, N. J.

A. N. OLDTIMER.

A REMARKABLE CHURCH.

To be Built Exclusively of Brick and Terra Cotta.

THERE IS NOW in course of construction in Chicago one of the handsomest and most substantial churches in this country, and when completed it will be a remarkable edifice. According to the Portsmouth (O.) Sentinel, it will be entirely of brick masonry. Even the window frames in which the glass will be set will be of brick. From floor to roof—outside and inside, walls and ceilings, casements and stairways, the visible and the invisible—will be vitrified clay, depending on itself for support and decoration. The style of architecture is Romanesque and Gothic, after the style of the twelfth and thirteenth centuries. The total length will be 210 feet; width, 110 feet, with two towers thirty-two feet square at the bottom and 245 feet high from the sidewalk. The body of the church proper inside will be sixty-eight feet wide. In the erection of this church there will be no plaster, no stucco, no imitation marble, nor shams of any kind. Rev. Geo. D. Heldman, who is in charge, says that "a building consecrated to the teachings of the eternal truth should of itself be true," and as good brick is one of the most durable things in nature or art, he will let it bear witness to its own strength and beauty. The main entrance will be through six pairs of doors into three large vestibules leading directly into the nave and side aisles. The nave will be entirely free from columns. The side aisles will extend all around the church and behind the high altar. The height of the nave will be seventy-five feet; width, forty feet between the columns which divide it from the side aisles. The body of the church expands as the front is approached. They have some buildings of this style in Europe, but nothing of the kind has ever been attempted in this country, and it will be watched with a great deal of interest by those interested in the construction of large buildings.

In consequence of its being so novel, no brick suitable could be found in the market, and the builder had to have made to order the various shapes required. There will be no less than five hundred of these different kinds of bricks and moldings. Terra cotta will be used extensively, both inside and out, from the finials on the spires downward. White terra cotta figures of religious subjects will decorate the interior. The altars, communion rail, front of organ loft and pulpit will all be of terra cotta.

About 2,500,000 brick will be required in its construction, of which about 500,000 will be of fancy moldings. The prevailing color of the brick will be light buff, with warmer colors for trimmings, running into dark brown. The body of the walls will be of light buff and yellow. The ribs of the arches and groins will be of molded bricks, the keystones of terra cotta. Not a foot of wood nor a yard of plaster will be used in the whole building. The brick casements will have grooves into which the glass will be set and fixed with putty. The great amount of brick used in the construction of this remarkable building will be furnished by the Webster Fire Brick Company, of South Webster, O.

REMARKABLE ILLUSTRATIVE PITCHERS. No. 1.

BY MRS. MARY E. NEALY.

THE SUBJECTS of these sketches are very notable ceramical productions on account of the beautiful relief work and the similarity of the clays in which the designs were wrought. They also were inspired by the most remarkable of the literary productions of English writers.

—The Witches in "Macbeth."—

This piece is owned by Mrs. Emily B. Livingston, of New York, who loaned it to me for the photograph, which was taken by Rockwell, in New York. The story of "Macbeth" is one of the most intensely dramatic of Shakspeare's works. Every one has read it, and almost every one has seen it performed upon the stage. It begins with the "weird sisters," and is interlarded in several scenes with the same supernatural beings.



The Witches of Macbeth, Executed in Relief in Lavender Paste.

The age was full of superstition, which always engenders crime, and finds its victims among the kindest and the purest. After a thorough rereading of "Macbeth" it is impossible to glance at this one scene, dominated by the witches, without a shiver of horror:

"First Witch—Thrice the brindled cat hath mewed.

"Second Witch—Thrice and once the hedge-pig whinest.

"Third Witch—Harpier cries, 'tis time, 'tis time!

"First Witch—Round about the cauldron go;

In the poisoned entrails throw.

Toad, that under a cold stone,

Days and nights hast thirty-one,

Sweltered venom sleeping got,

Boil thou first i' the charmed pot.

"All—Double, double, toil and trouble;

Fire burn and cauldron bubble.

"Second Witch—Fillet of a fenny snake,

In the cauldron boil and bake;

Eye of newt and toe of frog,

Wool of bat and tongue of dog,

Adder's fork and blind-worm's sting,

Lizard's leg and howlet's wing,

For a charm of powerful trouble,

Like a hell-broth boil and bubble!

Double, double, toil and trouble;

Fire burn and cauldron bubble.

"Third Witch—Scale of dragon, tooth of wolf,
Witch's mummy, maw and gulf
Of the ravin'd salt-sea shark,
Root of hemlock digg'd i' the dark,
Liver of blaspheming Jew,
Gall of goat and slips of yew
Silvered in the moon's eclipse;
Nose of Turk and Tartar's lips—"

But this is enough, and more, to prove the terrible power of invective possessed by the great Shakspeare, and also to prove the overpowering influence of superstition over the human mind.

AMONG THE POTTERS.

The manager of one of the local potteries was recently approached by a lad, the son of a friend of his, with the request that he be given the opportunity to learn a trade. "All right, my boy," was the response, "but which branch of the business would you like to learn? There are modeling and moldmaking, jiggering, turning, throwing, pressing, and the different branches of decoration." The ingenious lad ambitiously replied: "Well, if it's just the same to you, sir, I'd like to learn to be a boss."

* * *

The salesmen have been out on the road long enough to find out how the ground lays, and inquiries at the various potteries here all elicit the fact that some orders are coming in right along from every section; that all agree that the prospects are good, and that most dealers are waiting for the evidences of increased business before stocking up; that in the West dollar wheat is making everybody feel good, and that there is a general disposition to stiffen on prices and to rigidly adhere to discounts. There are more potters employed in Trenton than have been at the same time of year for four years. Characteristic of the new features of the season are the really beautiful effects in new colorings in decoration; the tendency to an early advance in the prices of cheap printed ware, in which there has been no profit for a long time; the improvement in color, and more particularly in the finish of semi-vitreous porcelain, and the production of specialties in small articles of china, elaborate in shape and decoration. Dealers will find many new things to interest them in the lines now being carried by the representatives of the Trenton potteries, and still more as the season advances. It is safe to assert that prices will never be lower, or discounts larger, than they are now, and that the rise in values, so pronounced in every branch of business, is bound to come in the crockery trade. Those dealers who avail themselves of the opportunity to buy at present values will make money, for with an advance of 12½ per cent., already arranged for this winter in the wages of operatives, the increase of prices must follow as a natural sequence. Furthermore, as things look now, it will tax the resources of the decorating departments to meet the demand for wares intended for November and December trade.—China, Glass and Lamps.

GERMAN NOTES—A NOVEL METHOD OF BURNING.

A NOVEL improvement pertaining to continuous kilns, in which the ware to be burned is moved through a stationary fire, has been patented in Germany. In the type of kiln alluded to the great difficulty is the construction of proper conveying apparatus, which must be simple and protected from the effect of heat. For this purpose various means have been considered, but in the few kilns actually constructed protected cars have been used. The inventor in question, however, proposes to use fire clay slabs, which are supported by loose balls, presumably balls of burnt clay. Thus a trough-like space beneath the fire room is filled with these balls, upon which the tiles, with their load, are gradually moved through the kiln. At the discharge end a lateral trough receives the balls as they come from the kiln. The inventor claims that by this arrangement ease of motion is attained, and the invention is especially intended for muffle kilns.

Owing to the hostile position of the Berlin City Architect towards brick architecture the Clayworkers' Association has taken steps to inform the building public of the practical and esthetic value of clay material as compared with the stucco fronts.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

A Dull Season in Maine.

Editor Clay-Worker:

The brick business in Maine is at a very low ebb, especially on the Kennebec river. The yards had all planned to run this season on a largely reduced scale, which nature has helped them to do by providing the worst weather ever known in the history of the business. As nearly all the brickmaking in this part of the country is on the old system of laying them out on the open yard to dry, of course, success depends largely on the kind of weather we have. There was scarcely half a dozen good brickmaking days from the time the season began to the first of July. Apparently the brick crop will be lighter this year than for the last twenty-five years, though, from present indications, fully equal to the demand. The lumber business is equally dull, and building of all kinds seems to have been suspended. The season has been so cold that the demand for ice has been limited, which seriously affects all kinds of business on the Kennebec.

MUD LARK.

Why do Brickmakers Live in Frame Houses and Build Iron Chimneys!

Editor Clay-Worker:

After several years of earnest discussion it is gratifying, from a brick man's point of view, at least, to find that practical experience is demonstrating the advantage and utility of erecting a chimney built of bricks in manufacturing and other establishment where draft for boilers is required, instead of the iron stacks, and the induced draft system which has been so advocated during the past ten years.

Mr. W. E. Crane, of the New England Engineering Company, a man of long and varied experience, contributes the following letter to the August number of "Power," and I would have great pleasure to know that a copy of it could be found within the crown of the new fall Derby of each inconsistent brick man whose iron stack casts a shadow over his works with the morning and evening sun:

—"Comparative Cost of Brick Chimneys and Exhaust Systems.—

"Mr. William O. Webber advocates the use of exhaust fans and the abandonment of brick chimneys.

"A few miles from here a railroad put in an exhaust system, ran it four years, and put up a brick chimney. Two years ago a party came to me and said they had figures for an exhaust system and asked if they had better put it in. They were asked how long the sheet-iron concern would last with the low temperatures of the waste gases, as corrosive as they are to sheet iron and steel, and it was pointed out to them the life of iron stacks. They would require a 15-horse-power engine for the exhauster they wanted. This would require at least five pounds of coal per horse-power, or 750 pounds per day of ten hours, and at \$3 per ton for 310 days would amount to \$1 per day, or over \$300 per year. The arrangement, consisting of exhauster, engine, etc., would cost within \$1,500 of the amount required for a brick chimney, not taking into account the possibility of a break-down on their engine, which would leave them dead. The 6 per cent. interest on the chimney meant \$90 per year. I have never heard that they regretted putting up the chimney, as they are assured of a long life and no machinery to get out of order.

"A brick chimney can be put up for less money than a

self-supporting iron or steel stack, lined half way, and generally can without the lining. I recently put up a chimney, 8½ feet diameter and 150 feet high, for \$2,800 above the foundation. The lowest price I could get for a heavy steel stack was \$3,500. Have lately been getting prices for a 6,000-horse-power chimney, with the result that brick is estimated at \$8,000 and steel-lined half way \$11,600. The base of the brick is 24 feet and the steel is 22 feet, so that the foundation would be nearly the same in either case.

"In the case of the brick stack it is probable that the foundation can be put in for the cost of the short stack, the exhausters, engines, piping, etc., leaving the \$8,000 to pay interest on as the difference between the two systems. This, at 5 per cent., makes \$400 per year, against the cost for fuel, oil, labor, repairs, etc., of the exhaust system, and you have no lying awake nights for fear some of it is going to rust out or break down."

E. T. F.

St. Louis News Letter.

The coal situation is retarding work in St. Louis to a great extent. It not only has a tendency to stop work that has been let, but also to prevent owners from letting contracts, as no definite time can be given them when brick will be furnished.

The brickmakers have not advanced the price, but some of them are willing, at an advanced price of 50 cents per thousand on contracts made since the strike, to commence delivery and pay an increased price for coal. This just about covers the advance in the price of coal.

At the last meeting of the Brickmakers' Association a uniform form of contract was adopted, and there seems to be a tendency to more harmonious work. Several new buildings are being projected, bidding is increasing, and the contractors say they are now having more opportunities for figuring than they have had for some time. The situation looks favorable to a good fall business.

Here is a verbatim copy of a letter recently received by the wife of one of the best known brick burners here. I think it is well worth preserving in the columns of the Clay-Worker:

"Potsdam, Dec. 28, 1897.

"Dear Sistre Mary:

"Your letter have I receive, and it had me very glad. But still more had it me glad if you me a faller letter had writed. Could you me a English newspaper send, so were I very glad therefore. I have now holidays, and at I am to all works use. We have had till only to-day a cold weather, there fore I could very little skate run. I have also now coult. I see you all mornings on your picture. I should me very glad, when you to us came. In the hope that you my wish fulfill, conclude I and remain your

You loving brother

"HERMANN.

"Also wish I you a happy New Year, health, and a long life. "Write me the faults which I have made."

Down in Jersey.

Editor Clay-Worker:

About 2 o'clock on the morning of Aug. 20 fire broke out in the hollow brick department of the Staten Island Terra Cotta Lumber Company's plant, and completely destroyed that branch of the works. While they have a complete water plant of their own, the fact that the fire started at night, while very few men were at work, prevented the extinguishing of the fire, because of lack of help. This part of the plant covered almost an acre of ground, and was a very complete one. As this part of the works had been shut for a number of weeks, and no fire being about the place, it looks very much like incendiarism. In this part of the plant was a battery of boilers, an immense Corliss engine, five Penfield wet pans, two very large Penfield brick machines, one clay crusher, shafting, etc. All this is completely destroyed, unless, perhaps, the boilers, which may be safe. A very large drier, filled with empty cars, is also a total wreck. The loss will probably be very great, but is no doubt covered by insurance.

The Standard Hollow Brick Company, of which Robert

Lyle is Manager, is again making some large improvements. A battery of three boilers, a brick building 60x70 feet, a new stack 150 feet high and a great deal of other work is being done. This factory promises to be one of the largest plants hereabouts in a very short time.

M. F. Edgar, the clay king, tells me that the past month has been one of the heaviest he has ever experienced since commencing the mining of clay, an average of about 200 tons per day having been hauled, and but for the fact that about fifteen days of July were so wet that nothing could be done in the clay mines the total per day would be greatly increased. Business must be increasing, or the demand for clay would not be so brisk.

W. R. O.

Perth Amboy, N. J.

Washing Clay in the Molds.

Editor Clay-Worker:

A reader of the Clay-Worker writes for information relative to the manufacture of pottery. He says: "I have been trying to mold some pieces, but find the clay sticks to the molds or is full of air blubbers." From this, I judge the party has encountered some difficulties in the process of casting, the clay adhering to the walls of the molds and peeling, and when he does succeed in getting a piece out it is full of air bubbles. It is entirely a question of manipulation and workmanship.

The clay for casting must be old-made slip, and lawned through a finer mesh than is necessary for pressing clays. A stock of this old slip should always be kept on hand, as, like good wine, the older it is the better. A very little gum arabic dissolved in water and added to the slip is sometimes an advantage, as it helps to make the texture of the clay firmer for handling, but it must be used very sparingly, as otherwise it will affect the color of the ware in firing.

With regard to air holes: To remedy this the inside of the molds must be painted with slip with a camel's hair brush before the slip is poured into the molds, and while the slip is being poured in the whirler should be kept slowly revolving. Again, the greatest care should be taken in drying the molds, which should not be done too quickly.

New molds never give satisfaction the first firing, as the mold size has first to wear off. At the same time the molds must be in perfect condition. Casting molds only last about half the time of pressing molds.

It is not possible to say much more without seeing the piece made. Workmen will frequently rub off with their fingers the pin holes that are caused by an overworn mold.

W. P. JERVIS.

A Syracusean at the Home of the Clay-Worker.

Editor Clay-Worker:

The writer lauded in Indianapolis Saturday evening, Aug. 14. We had hardly done the good things at our evening meal when there lit down upon us the genial, courteous Potts, who did us all so many honors and hospitalities during the Indianapolis Convention, and deeded over to us again the freedom of your beautiful city, just as freely as that whole Indianapolis crowd of generous, grand fellows did a few years since. Long may they all live upon this green earth, and when the trumpet shall blow for them may they receive the reward of those who have made much machinery and many bricks. But the feast was not over. Sunday morning found our genial friend again at the hotel, with his good wife and carriage, and off we went to see the town, and oh! the beauties of that ride! Would that we had the brain and pen of a Randall that we might picture to the readers of the Clay-Worker something of the grandness and glory of your noble city. But time and space will not permit a detailed description. Stopping at your Soldiers' Monument, we stood and looked with wonder and reverence, and felt like uncovering our head in the presence of its august majesty and grandeur, and our heart beat a soldier's thanks to the people of Indiana for this noble exhibit of their patriotism and gen-

erosity. No wonder the Clay-Worker is such a paper as it is. How could it be otherwise, with its windows looking out upon such a work of art and patriotism? From the top of this monument we took in the broad expanse which your city covers, and we proclaimed it next in beauty, if not equal, to that obtained from Washington Monument. Descending, we made a break for the sanctum of the Clay-Worker, just across the street, but found it bolted and barred, just as it should be on Sunday, and its editor, we were told, absent on the shores of some beautiful lake. Long may he be with us to publish his paper and go again to his cottage home. But our Indianapolis friend Potts is no "quitter," for he and his wife had not yet completed the programme. We were taken to his pleasant home, and there dined upon the fat things of the West, and I pronounced it good, and left with this thought in mind: "There is no land better than the good State of Indiana, and no welcome more cordial than a Hoosier's welcome." Monday morning, regretfully, we shook the dust of your city from our feet and departed for our own home, with memories that will never leave us until we read our last Clay-Worker and make our last brick.

Syracuse, N. Y.

C. H. MERRICK.

Ohio Valley News.

Editor Clay-Worker:

It has been a long time since business has been so good among the brick and sewer pipe manufactories of this valley. All the plants are running to their full capacity, with orders ahead that will insure a good business all fall.

The coal strike has been a source of much embarrassment to the manufacturers, and those not mining their own coal have been compelled to close down now and then, awaiting a supply.

One prominent Toronto, O., sewer pipe manufacturer said that his business for the month of August was much in excess of any month for four years, and he had no traveling men on the road at present.

The sale of the Midvale Fire Brick Works, at Midvale, O., was confirmed by Judge Douthitt, of Tuscarawas county, July 19. Sharp Bros., of New Philadelphia, were the purchasers, and the price paid was \$1,382. The plant originally cost over \$12,000.

It is rumored that Capt. John Porter, the pioneer paving brick manufacturer, of New Cumberland, W. Va., and A. P. Howard are negotiating for the erection of a mammoth paving and fire brick works at Congo, Hancock county, West Virginia.

The McElfresh Clay Manufacturing Company have completed their improvements at their sewer pipe plant at Penrith, W. Va. They built a large frame addition to their works, almost doubling their capacity. The works resumed in full Aug. 15.

The Barvard Brick Works, at Bellaire, O., were offered at assignee's sale for the third time Aug. 14, but for lack of bidders did not sell. The plant was appraised at \$39,925. The plant was appraised again, and will be offered for sale Sept. 15.

The deal between the East Liverpool (O.) Land Improvement Company and the Sebring Pottery Company for the location of the new porcelain works at the East End is completed. The Sebring Company will get a bonus of \$20,000 and a free site. They are to erect a new ten kiln plant, from which only the finest grade ware will be turned out.

The potteries in this valley using foreign clays have been notified of an advance of about 20 per cent. This is said to be in retaliation of the duties imposed upon foreign ware under the Dingley tariff law. They have refused to pay the advance, as they claim they can make just as good pottery out of American clays.

The United States Fire Clay Company, of New Lisbon, and the Columbia Sewer Pipe Company, of East Palestine, have been compelled to be idle on account of the scarcity of coal, occasioned by the strike.

The contract for 1,000,000 pavers for the city of Steubenville

was awarded Sept. 7 to the Toronto Fire Clay Company, of Toronto, O.

The Tiltonville Pottery, which started in full Sept. 1, is again practically idle, and the men say the reason they are not at work is that they have not received their pay. They claim the company owes them part of their wages for their last work, three or four months ago. It is claimed the company has been paying them in installments of \$5 and \$10, and they are still behind. By quitting they expect to get all the back salary due them and start off in good shape again.

The immense plant of the Royal Clay Manufacturing Company, of Uhrichsville, O., will again be offered at receiver's sale on Oct. 3. All the personal property was disposed of at the last sale.

BUCKEYE.

PACIFIC COAST NEWS.

THE BRICK and terra cotta people have not yet experienced the wave of prosperity, but they are sanguine, nevertheless, over the bright prospects. The great rise in the wheat market is going to prove a stimulus such as no other means could bring out, and it merely goes to prove that in spite of all arguing to the contrary wheat is king. Locally, there is very little doing, but the near future will be productive of work, as some very fine buildings are under consideration, and one has already been started, namely, Wells, Fargo & Co.'s fine structure on the corner of Mission and Second streets.

D. E. Matteson has just finished burning, at Grass Valley, Cal., what is without doubt the largest kiln of brick ever fired in Nevada county. There are 300,000 bricks in the kiln, which are made from a fine stratum of brick clay which Mr. Matteson discovered on Union Hill, near the town.

A quarry of splendid fire clay has recently been opened near Anthony, N. M. The clay is found in the form of shale, and, owing to its great hardness, must be crushed before it can be worked. The El Paso Brick Company is working the deposit, the principal difficulty so far encountered being to burn the brick to a uniform color. The weight of the brick is seven pounds, two more than that made in El Paso. As soon as the difficulty regarding the burning of the brick is overcome the company will, without doubt, be kept busy filling contracts, as they already have the contract for a million to be placed in Mexico. It is said that if brick equal in quality to the sample shown is turned out the company will get the contract for the Pennsylvania State Building, in Philadelphia.

Stradling & Gear, of Auburn, Cal., have commenced work on a brickyard. The first kiln will contain 100,000, and they hope to be able to supply the demand for the new buildings.

L. Owens will shortly begin the manufacture of brick near Springdale, Wash.

The Washington Brick, Lime and Manufacturing Company, of Spokane, Wash., has commenced work on a larger and much better plant to replace the one recently destroyed by fire. Three large buildings will be put up—the pottery and dry pressed building, 60x175 feet; the paving brick building, 50x100 feet, and the stock shed, which will be 30x150 feet. The kilns of the plant will be under a separate cover of iron, and the newest and most modern machinery will be put in, especially that required in the manufacture of vitrified paving brick.

A New York man has written to Secretary Zeehandelaar, of the Los Angeles, Cal., Merchants' Exchange, inquiring what the chances are for starting a pottery in that city.

Peter Grant, of Santa Barbara, Cal., has entered into a contract with the Alcatraz Asphalt Company to furnish them with 150,000 red brick, to be made and burned near Gaviota. The entire lot of brick must be delivered by Nov. 1, or Grant will have to forfeit \$5 for every day over that time.

Robert G. Balcomb, of Algodones, N. M., and John M. Moore and T. A. Fincial, of Albuquerque, N. M., have filed articles of incorporation of the Algodones Tile and Brick Company. The capital stock is \$10,000, and a general brick, tile, clay and pottery manufacturing business will be conducted. The prin-

cipal place of business of the new company is Algodones.

Mr. Miller, of the Fairhaven, Wash., brickyard, will make improvements to the plant and carry on the business on a larger scale in the future.

The brickmakers of Spokane, Wash., have advanced the price of brick \$1 per thousand, but report a better business than for several seasons past.

Times seem to be improving for the brick trade in Southern California, the yards at Whittier, Inglewood and the Pacific Clay Works, at Corona, having all started up again, after a shut-down of some months.

The First National Bank of San Jose, Cal., has leased the pottery plant in that city.

A brickyard in Paso Robles, Cal., would not be amiss. There being none there, those having use for bricks have to go to other towns to purchase them.

The Baden Brick Company has put in a new plant at Baden, Cal. The new continuous patent kiln which has been put in is 160 feet in width, and the smokestack in the center is 120 feet high. There is a fine deposit of first-class brick clay close to the company's plant.

Work on the new building of the Young Men's Christian Association in Portland, Ore., will begin at once. It will cost about \$50,000. Part of the building will be of Newberg white pressed brick, and the brick addition will also be faced with the same material.

Bricks are now being delivered from the new kiln near the university grounds at Missoula, Mont. Experts have pronounced the product of this new yard to be of excellent quality, the bricks being of good color, strong and firm. They will be used in several blocks now in course of construction, and also in the university building.

The Enterprise Clay Company, a new concern at Ogden, Utah, is now ready for work. A fine kiln has been placed in the factory, and the clay deposit is only about forty rods from the factory. The capacity of the factory will be about one and one-half miles of 4-inch tiling a day, but it is hoped this capacity will be greatly increased before a great while. Stone-ware, sewer pipe, tile flooring and paving brick and other clay products will be manufactured. The company is composed of J. S. Smith, C. Garf and M. Butcher.

R. G. Wood, a well-known contractor and brick manufacturer, died recently in Fresno, Cal.

SUNSET.

A Short Season on the Hudson.

Editor Clay-Worker:

There is a report among the leading brickmakers of this section of the Hudson river brickyards that there will be a very general and early shutting down of the works in this vicinity. The ruling prices have been so low and the season so unfavorable that it is expected that fully 90 per cent. of the manufacturers will close early in September, unless there should be a considerable advance in the prices. It is hardly probable that there will be any such advance, because the steel construction buildings are the chief buildings that are now being erected, and they do not demand any large amount of common brick. The 18th of September is the time now named for a general closing of the yards, which is about one month earlier than usual.

Kingston, N. Y.

MONMOUTH.

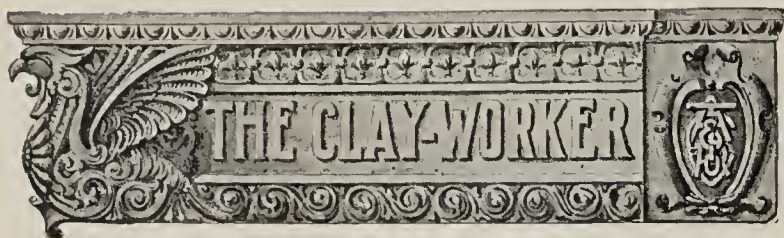
Removal of an Extensive Brick Plant.

T. A. Randall & Co., Indianapolis, Ind.:

Gentlemen—In reply to your favor of recent date, will say we bought the government paving brick plant at the National Home, D. V. S., this city. Have removed it to our own ground. We will manufacture paving brick, mud and dry pressed building brick. We have two dry pans, Raymond "777" brick machine, Penfield plunger, Simpson dry press and all the other machinery we need. M. H. Carr resides in Leavenworth, and will look personally after the business. Robert Nesch is proprietor of the plant at Pittsburg, Kan., known as the Pittsburg Vitrified Paving Brick Company. Very truly yours,

THE LEAVENWORTH PAVING BRICK CO.

Leavenworth, Kan., Aug. 23, 1897.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " " "	10.00
Ten copies, " " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVIII. SEPTEMBER 1897. No 3.

CURRENT COMMENT.

Dollar wheat means a revival in the tile business. Progressive farmers know that no investment on the farm pays better than tile drainage, and now that they are marketing immense crops at good prices they can again take up the work of improving their land. The wise tilemaker will now begin to cultivate his own field by spreading the gospel of farm drainage.

* * *

Two papers in this issue, "A Hollow Block Plant" and "The Use and Advantage of Hollow Brick," should be read with more than passing interest by our tilemaking readers. Most of the latter will doubtless be kept busy for a season or two meeting the increased demand for tile, but when the rush is over the hollow block business will prove a profitable venture for many, as most tile factories are fairly well equipped for that work.

* * *

The great coal strike seems at an end, but its effects will be felt for several months. The scarcity of fuel in many quarters has caused the shutting down of brick and tile plants and a consequent advance in price of clay products. Manufacturers will do well to follow this up with still further advances, till they can again pay living wages and realize something more than glory for their labor and investment.

* * *

A very important event at the Hub was the recent opening of a part of the subway, Boston's new underground thoroughfare for street cars. The sections to be operated for the present are about three-quarters of a mile long; other sections will probably be opened in the spring. The trip from the public garden entrance to Park street was made in a little over four minutes. One hundred thousand people rode through the subway the day that it was opened. The contract for building the last section, near the Union Station, has been awarded and the work started. The Transit Commissioners believe that before next summer the entire subway will be in use and Tremont

street wholly free from cars. As the underground work requires a large quantity of brick, the brickmakers of that city look upon the enterprise with favor.

* * *

With the announcement of the Illinois State Convention of Clayworkers, which will be held at Decatur, Jan. 5 and 6, we enter the campaign for another Convention season. The Clay-Worker has always been foremost in the work of organizing and maintaining trade associations, whether local, State or national, and expects to continue in the good work, for its success means the uplifting of the entire clayworking fraternity. With renewed prosperity there should, and probably will, be a larger attendance at all our Conventions the coming season than for several years.

* * *

The Ohio School for Clayworkers will begin another term on the 15th inst. There is every reason to believe that there will be an increased attendance, for clayworkers are awakening to the importance of better and more technical knowledge of their business. Those having sons whom they expect to take up and continue the work where they leave off should see to it that these boys are thoroughly equipped for what ought to be their life work. There is no way in which they can accomplish this so effectively as by a course in the Ohio School for Clayworkers, for, under Professor Orton's direction, the training is thoroughly practical in every detail.

* * *

The political situation is somewhat interesting, even to those of us who are not given to political affairs. In a few States there are State elections, and in others important municipal elections, and in most of them the prevailing issues are purely local, yet political managers in every case are intent on turning all waters on to their respective party wheels, each party declaring that it is the only and the original advocate of cheap gas, or water, or car fare, or whatever is uppermost in that particular locality, with here and there an echo from last year's issue on silver and the like. These are very feeble, however, the events of twelve months settling many of the visionary theories of a year ago.

A TANGIBLE CASE OF SUPPLY AND DEMAND.

We are in the midst of sensations. Owing to a foreign demand on the heels of a good crop, wheat is playing around the dollar mark, more likely to go higher than lower until good crops in other wheat producing countries affect the general supply. Primarily, this affects the farmers, but merchants share not a little in the activity of the market, while the home consumer of wheat bread, at 20 per cent. advance, does not readily see wherein the short crops in Europe have greatly benefited him, since it has not increased his wages or diminished his demand for the staff of life. If he will but wait patiently a little while he will realize a benefit, for with greater commercial activity will come more work and better wages.

THE FAR REACHING EFFECTS OF THE MINERS STRIKE

The paramount domestic interest is the miners' strike, now well along in its third month, and yet unsettled. A temporary truce seems to be agreed upon, but its very conditions imply an early opening of the whole question. Meanwhile it is impossible to estimate the cost of the strike to date. The intense suffering of the strikers themselves and their families is not the least. Many miners are in great need of food, and in time of great abundance. But others have been drawn into the same vortex. The want of coal has forced the suspension of a great many industries, turning out of employment those who are dependent upon their daily earnings. To these calamities have been added the horrible slaughter of many of the strikers. Whether this was necessary the Clay-Worker does not attempt to determine. The slaughter is to be lamented, and so are the conditions which led up to it and at least gives a color of justi-

fication. It is neither any palliation nor aggravation that the killed were mostly a horde of foreigners, who, by the cheapness of their labor, had obtained employment, and now wished to prevent others from working at such wages as they saw fit. The event is deplorable, as also the causes that led to it.

AFFAIRS AT GOTHAM.

By far the most interesting and most unique municipal campaign of the season is that of the greater New York, which is about to elect its first Mayor. Everybody believes that no municipal reform is possible there that does not break the power of Tammany. Now, Tammany is a semi-political organization, composed chiefly of Democrats, but having a large Republican contingent, which shares in the spoils. With rare exceptions Tammany has had control of New York local politics. To meet it there has been organized a "Citizens' Union," a kind of political club that is powerful in times of peace and a good while before the election, but which is apt to go to pieces when election day comes. This Union, six months or more ago, asked Seth Low, once a very competent Mayor of Brooklyn, to be their candidate, but he declined unless there should be some evidence that the people wanted him. He had no faith in the professions of a class of goody-goody people, who are powerful on resolutions, but who care very little about voting. To meet his conditions papers were circulated in the form of a personal request to him to stand for the office, with promises to vote for him. When the aggregate number of names had reached 128,000 he consented, and is now a candidate. Tammany has its candidate and the Republicans are likely to have theirs, though at the time of going to press this is uncertain. At all events, the case is an unusual one and the outcome will be watched with interest. If Mr. Low is elected it may lead to a new departure in municipal politics. Who knows but it may result in the long-hoped-for rise in the price of brick?

A LIMIT TO ALL THINGS, EVEN COMPETITION.

There is no longer any disputing the fact that business is constantly improving. Persons who want to work find employment at some price or other in almost any industry which contributes to the general welfare of society, but not always at such wages as seem very remunerative. There is probably no immediate relief from this condition; certainly no artificial device can altogether remedy it. Speaking of our special industry, we still hold that in nearly every locality, and without materially affecting the demand for our output, a judicious combination can be made as to prices, so that labor may be better paid and capital better rewarded. We readily recognize the fact that no arbitrary standard can be fixed which shall be much above the average price of other commodities, for under the unreplicable laws of business there comes with time a leveling process which no artificial force can escape; yet there is certainly a just way of escaping or preventing ruinous competition which does not allow a suitable compensation for labor and money expended. This is now the vital question with the brickmaking craft. The quicker it is solved fairly the better it will be for the brickmaker and the community in which he operates, for better prices for brick mean better wages and greater prosperity for all.

A BUSINESS PROPOSITION.

Some of the largest brick concerns in the country, together with some of the smaller establishments, have allowed themselves to be driven into selling brick for less than they are worth. It is certainly rather difficult to keep prices up when the supply is greater than the demand. But, on the whole, a difference of from 50 cents to a dollar a thousand has little or nothing to do with the volume of brick used, and it means a great deal to the brickmaker. When labor organizations can go through hard times and maintain prices, as have the bricklayers, the hod carriers, cigar makers and many others, is it not astonishing that intelligent business men have not shown the

capacity to maintain a fair margin of profit on their product? We are disposed to say that the decrease in the price of brick has not caused any more building to be done or more pavements to be laid. It suggests itself to us that the business man who is bright in other things should be able to solve this problem in such a way as not only to advance prices at this time, but as well to prevent a recurrence of the disagreeable experience of recent years. The question of demand will make this matter easier in the near future. But the question is larger than that which involves present considerations. It should mean an organization or general understanding which would carry us more easily and more profitably through periods of depression which we have now learned to expect.

VITRIFIED PAVERS FOR FINE FRONTS.

The pictures which we give of the building for the Home of the Friendless, in Chicago, are interesting not alone for their general artistic merit, but as well on account of the means employed to accomplish an artistic result. As will be seen from the description, this building is faced with paving brick (seconds) from Galesburg, Ill. The decorative parts are terra cotta. The natural color of the brick develops a rich brown and a variation in tint which is being more and more sought for by the best architects. There was a time when it was supposed that for fronts each brick should be exactly the same color as every other brick. But in examining some of the brick work of earlier centuries, where time and circumstances have made changes in color, it has been noticed by artists that the variation in color, when not too great, has been the means of producing highly artistic results. The architect of one of the most imposing houses in New York went to a terra cotta establishment some years ago and said: "I want to look over some of your cast-off clay products." In going through the yard he saw some blue mottled fire brick which were used for lining kilns. He bargained for them, and they were used to face one of Gotham's finest houses, and mottled brick became a fad. This was about the first use that was made of this kind of brick for fine fronts in this country. While it has been carried to extremes in some instances, on the whole the result has been very good. In connection with the brick used for the Home of the Friendless we are taught a lesson in regard to the size of brick made for paving purposes. These brick being of the same form and size as the ordinary building brick, it was possible to use them on this work. We have noticed in this city that in some instances the hardest of paving brick have been used for facing above grade to the line of the first floor because of their non-absorbent qualities. Out of this accidental use of paving brick we may expect to see an increased market for this character of product. Then paving brick manufacturers will wish they had been content to make standard size brick instead of the large block.

TRADE AND COMMERCE.

For several years the question of a Department of Trade and Commerce in connection with our government has received some attention aside from the government itself. Individuals, organizations and various journals and magazines have given this question urgent attention. There is nothing which the government can do for the people which is better deserving of attention than the organization of a Department of Trade and Commerce. The English government is stronger in that department than any other. It has been the policy of that government to give its best attention to the commercial interests of its people. The best brains have always been employed in that direction. Great Britain is a nation not overlarge in its home territory, certainly not overfertile, a nation not over-intelligent, but one aggressive, strong, normal, one-sided. That side is the commercial welfare of its own people. It looks out for their commercial interests in every way. Its greatest wars have been waged in the interests of its commerce. It has cap-

tured territory and has exhausted the limit of human energy in looking to the commercial interest of its people. Within recent years Germany has made a movement in the same direction in a different way. Its methods are more scholastic, less brutal, but none the less aggressive. It has educated its manufacturers, it has taught its people the requirements of the rest of the world, and has sent educated salesmen into the market, so that, go where we will, we find advocates of German products all over the globe. It is along this line that we may expect the development of American commerce. There is nothing better that a government can do than to use its power for the commercial betterment of people generally. We have large surplus of products, and must look for foreign markets.

While it is true that American manufacturers of brick may not be expected to profit largely in a direct way through the exportation of any large part of their product, yet the general prosperity which would come about through increased foreign business would reflect immediately and directly to the interest of all. Manufacturers on the coast, with cheap water transportation, might find a market for terra cotta, a high grade of face brick, or even paving brick, in the Spanish-American countries, but there is no reason to expect great things in this way. We heartily lend any influence which we may have toward the organization of trade and commerce by our government, believing that what is for the general good would be for the individual good of the clayworkers of this country.

HONEST PUBLIC IMPROVEMENTS.

This city is now on the eve of a municipal election. During recent years, operating under its present charter, we have, through our Board of Public Works, indulged in great public improvements. We have passed from a city not cleanly, badly paved, without an adequate sewer system, to one which is a typically clean city, one well paved, and a sewer system which is complete and well advanced to meet the requirements of the present time. All this work has caused immense expenditures. No administration has been able to succeed itself. The Democratic Mayor was succeeded by a Republican and the Republican by a Democrat. The party organization on the outside has, because of the large expenditure, been able to make promises to the people, indicating lighter expenditures and better work, and thus has been able to successively obtain possession of the municipal government. Now, in truth, no one has been able to bring seriously into question in a thoroughly rational way any of the performances of any department of our government by either party. The breath of scandal has found lodgment no place. There has never been a suggestion of corruption which, by any stretch of imagination, could be sustained. We are now speaking of the operation of this government under its present charter, which has been in operation during the last six years. We speak of this as a matter of general interest, and feel certain that it would be to the material interest of clayworkers if all cities could be as well governed. Expenditures in improvements are made which, under less honorable administrations, could not be made, and thus the sales of all materials which could go to the improvement of the city are greatly increased. There has been an extensive use of vitrified brick, both for sewers and pavements, and this will increase, particularly the latter, for we have many miles of good brick paved streets, and our people are beginning to appreciate the fact that they are better, more durable and economical than asphalt or any other paving material.

A dispatch from Vladivostok, dated Aug. 30, says that the first sod in the work of construction of the Chinese Eastern Railroad was cut in Chinese territory, near Stanitzapoltavskaya, on that date. Just imagine, if you can, a Mongol brakeman calling: "The next station at which this train stops is Stanitzapoltavskaya."

AMERICAN SEGER CONES.

IN THE AUGUST CLAY-WORKER much was said about Seger cones. There is no doubt but that these cones are a great help to the clayworker in burning his wares. Practice has given ample proof of this, and to-day these small pyramids are used by hundreds of European manufacturers. But the American craftsmen have likewise made a good start, and it is only a question of time when the Seger pyroscopes will be in general use. As the Clay-Worker has repeatedly mentioned, cones are now being manufactured by Prof. Edward Orton, Jr., at the Ceramic Department of the Ohio State University, Columbus, O. The American cones are the result of a good deal of accurate work done by Prof. Orton, and they are fully equal to the imported ones, as has been demonstrated by a great number of carefully conducted tests. Some of our largest clay-working establishments have made the American cones a regular feature of their burning. It seems to the writer that every clayworker should avail himself of the valuable help thus offered to the craft. The outlay of a few cents for cones may be the means of saving several hundred dollars.

OHIO'S SCHOOL FOR CLAYWORKERS.

Beginning of the N. B. M. A. Scholarship in the Department of Ceramics, O. S. U.

The opening term of the fourth year of the Department of Ceramics in the Ohio State University begins Sept. 15.

The N. B. M. A. free scholarship, which was won by A. V. Bleininger, one of Professor Orton's brightest and most industrious pupils, has been fully provided for, as will be seen by the accompanying letter of acknowledgment from Capt. Alexis Cope, the Secretary of the Board of Trustees. The latter body are heartily in accord with Professor Orton in this work, and propose to do all in their power to make the Department of Ceramics one of the successful features of this great institution of learning.

Those of our readers who have been thinking of entering this year's class will do well to apply for membership at once and start in at the beginning of the term. Address all communications relative to the school to Prof. Edward Orton, Jr., Columbus, O.

—Letter of Acknowledgment.—

Board of Trustees Ohio State University,
Alexis Cope, Secretary.

Columbus, O., Sept. 11, 1897.

Mr. T. A. Randall, Secretary National Brick Manufacturers' Association:

Dear Sir—I am directed by the Trustees of the Ohio State University to acknowledge receipt of your check for \$250 towards the support of the scholarship in the Department of Ceramics, as proposed by your Association April 7, 1897, and to say that the Trustees have added thereto the sum of \$100 as proposed, and that this entire sum will be held for the support of said scholarship and paid out strictly in accordance with the terms your Association has proposed.

Thanking you in behalf of the Trustees and personally for the interest your Association has taken and is now taking in this department, I am, very respectfully,

ALEXIS COPE, Secretary.

"THE BRICKMAKER TO THE PRESIDENT" WILL BUILD A MODERN PLANT.

J. C. Adams, Indianapolis, well known to the brick fraternity as "the brickmaker to the President," is arranging to erect a large soft mud brick plant near Martinsville, Ind. To start with, the plant will have a daily capacity of 40,000 building brick. The material used is a fine quality of shale that burns a fine dark red. Mr. Adams intends to have an up-to-date plant, equipped with every modern improvement. As he is a past master in the art of brickmaking, there is no doubt but he will accomplish his purpose and soon be a large factor in this market. Ultimately, he may also make pavers, but will, of course, have to build an addition to the plant for that purpose.

A DREAM.

I had a dream the other night—
 (What handy things are dreams,
 When men who scribble poetry
 Run short of better themes!)
 I dreamed that fifty years had rolled
 Into the misty past,
 And that the grand old Ship of State
 Had nobly met each blast
 That threatened her with certain wreck—
 Had weathered many a gale
 That gave a start to stoutest heart,
 And made e'en strong men quail.
 A tariff bill had been devised
 That suited every man;
 The money question, too, had been
 Arranged in such a plan
 That every one was satisfied—
 The rich and poor alike—
 And Capital, and Labor, too,
 Had ceased to "grind" and "strike."
 The North and South forgot that they
 In deadly strife had met
 And fought till many a battlefield
 With heroes' blood was wet.
 And e'en the loud-mouthed Anarchist
 Had ceased to flaunt the rag
 Of Anarchism. Convinced was he
 We needed but one flag.
 And then I dreamed that once again
 There raged a dreadful war,
 And many a stream in our fair land
 Ran red with human gore.
 What caused the trump of war to sound?
 To jealousy 'twas due.
 New York had reached for Texas, and
 Chicago claimed it, too.
 —Chas. S. Carter, in Puck.

A CONTEST IN BRICKMOLDING.

A novel challenge, made by Henry Inhalt, a brickmaker of Anderson, Ind., has been accepted by John Blackman, of Newberg's brickyard, Indianapolis. Inhalt has a record of 3,000 brick molded and cribbed in six and one-half hours, and is willing to bet that it cannot be beaten.

CEMENT ROOFING TILES.

A new plan has been devised in Germany, it is said, for the manufacture of cement tile. The promoters think these tile will be the roofing of the future, for they are not only cheap, but so durable that when once laid on a roof they will never wear out. The idea is to make the tile of a mixture of sand and cement, in the proportions of three parts of sand to one part of cement. A small portable press is used for molding the tile, which are made on the premises where they are to be used. After being formed, the tile is allowed to be dried for two or three days, when it is ready for the roof. In form and general appearance they resemble clay tiles.

INDIANA CLAY—A GREAT INDUSTRY BEING GRADUALLY BUILT UP.

State Geologist Blatchley is spending most of the summer in the clay producing counties of northern Indiana, and is giving particular attention to the soil of Lake and Porter counties. He says the clayworkers of that section of the State are gradually building up a valuable industry. At Hobart, which has become one of the centers of the industry, there is a new plant for the manufacture of pressed brick which cost \$150,000. There is another concern at that point which is making terra cotta lumber for use in the construction of fire-proof buildings, and there is a growing demand for the material.

These rich deposits of clay were placed there, the Geologist says, before Lake Michigan came into existence. That section was occupied by a body of water which geographers call Chicago lake. When the waters disappeared they left the clay, which the Geologist thinks is of unusually fine quality. It contains no sand or pebbles, and what little lime is found in it is so disseminated that it gives the clayworkers no trouble.

TABLE OF CONTENTS.

American Architecture in Clay	177	Indiana Clay—A Great Industry Being Gradually Built Up	219
Albany Slip Clay	178		
The Clayworking Industries of Victoria, Australia (No. 6)	180	CORRESPONDENCE:	
Successful Advertising	181	A Dull Season in Maine	205
Tile Brick and Terra Cotta at the University of Illinois	182	Why do Brickmakers Live in Frame Houses and Build Iron Chimneys	205
Button-Hole Talks	182	St. Louis News Letter	205
Cream Colored Brick — How they are Made in Milwaukee	183	Down in Jersey	205
Brickmaking in Maine	185	Washing Clay in the Molds	206
Those Who Have Gone Before	186	A Syracusean at the Home on the Clay-Worker	206
By the Light of the Kiln Fire	187	Ohio Valley News	206
Mind Your Own Business	188	Pacific Coast News	207
A Hollow Block Plant	188	A Short Season on the Hudson	207
Terra Cotta Construction	191	Removal of an Extensive Brick Plant	207
The New England Stove Lining Association	192		
On the Threshold	192	EDITORIAL:	
Use and Advantage of Hollow Brick	193	Current Comment	216
Unreliable Information	194	A Tangible Case of Supply and Demand	216
The Inventor's Duty to Himself and to the Public	196	The Far Reaching Effects of the Miner's Strike	216
1797. Steubenville, Ohio. 1897.	199	Affairs at Gotham	217
History Repeats Itself	199	A Limit to all Things, Even Competition	217
Modern American Front Brick	200	A Business Proposition	217
The New York Market	202	Vitrified Pavers for fine Fronts	217
A Remarkable Church	203	Trade and Commerce	217
Remarkable Illustrative Pitchers	204	Honest Public Improvements	218
Among the Potters	204	Editorial Notes and Clippings	222
German Notes—A Novel Method of Burning	204		
American Seger Cones	218	MISCELLANEOUS:	
Ohio's School for Clayworkers	218	A Dream	219
"The Brickmaker to the President" Will Build A Modern Plant	218	A Contest in Brickmolding	219
Cement Roofing Tiles	219	Some Reasons Why Land Should be Tile Drained	226

Index to Advertisements on Next Page.

Books for... Brickmakers.

"CLAY GLAZES AND ENAMELS,"	
Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	
Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	
J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	
Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	
H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	
J. J. W. Billingsley,	1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
 Indianapolis, Ind.

INDEX TO ADVERTISEMENTS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page
Ross-Keller Brick Machine Co.	175	The American Clay-Working Machinery Co.	225 240, 249
Simpson Brick Press Co.	173	The Fernholtz Brick Press Co.	174
The Chisholm, Boyd & White Co.	172		

Brick and Tile Machinery.

Anderson F'dry & Mach. Wks.	245	The American Clay-Working Machinery Co.	225, 240, 249
Baird & Son, H. C.	232	The Horton Mfg. Co.	220
Brewer, H. & Co.	235, 247	The Eastern Machinery Co.	250
Central Machine Works.	229	The Henry Martin Brick Mach. Mfg. Co.	244
Chambers Brothers Co.	169, 243	The Leader Mfg. Co.	243
Chicago Brick Machinery Co.	241	The Ohio Ceramic Engineering Co.	170
Eagle Iron Works.	229	The Turner, Vaughn & Taylor Co.	226
Freese, E. M. & Co.	248	The Wallace Mfg. Co.	251
Hensley, J. W.	231	The Wellington Machine Co.	223
Kells & Sons.	232	Williams Patent Crusher and Pulverizer Co.	240
Means & Co., Jas.	229	Wiles, Co. A. M. & W. H.	237
Michigan Brick and Tile Machine Co.	231	Woolley Foundry & Machine Works.	242
Madden & Co.	234		
Newell Universal Mill Co.	242		
Potts & Co., C. & A.	246		
Raymond & Co., C. W.	221		
Stedman's Machine Works.	237		
Steele, J. C., & Son.	237		

Brick Kilns and Dryers.

Alsip, S. H.	236	Phillips, S. G.	235
Conley & Wolfe.	238	Reppell, L. H.	236
Cummer & Son Co, The F. D.	225	Sharer, Geo. W.	238
Eudaly, W. A.	239	Swift, F. E.	230
Hundt, F. & Co.	228	The American Blower Co.	227
Leary, W. A.	230	The Fernholtz Brick Press Co.	174
Morrison & Co., R. B.	239	The Standard Dry Kiln Co.	176
Pike, E. M.	228	Wolf Dryer Co.	252
		Yates, Alfred.	228

Brick Yard Supplies.

Arnold, D. J. C.	170	The Atlas Bolt & Screw Co.	234
Coldewe & Co., G.	233	The Buck Machine Company	232
Carnell, Geo.	236	The Harrington & King Performing Co.	171
Cox, Geo. S.	233	The Henry Martin Brick Machine Mfg. Co.	244
Caldwell, H. W. & Son Co.	227	The Keystone Brick-yard Supply Company	230
Carmichael, T. W.	234	The Pittsburg Mineral Screen Company	228
Marion Steam Shovel Co.	241	Wagoner, M. V. B.	233
Mey, F. H. C.	228	Walworth Run Foundry Co.	227
Mershon & Co., W. B.	171		
Newton, A. H.	233		
Phillips & McLaren.	231		

Miscellaneous.

Associated Trade & Industrial Press.	230	Lake Erie & Western.	232
Baird, Henry Carey & Co.	231	Main Belting Co.	230
Big Four R. R.	234	Monon Route.	233
Cincinnati, Hamilton & Dayton R. R.	235	Osborne, W. R.	229
Chesapeake & Ohio R. R.	233	Ropkey-Mason Engraving Co.	231
Dean Bros. Steam Pump Works	229	Tennille, A. F.	232
Dover Fire Brick Co.	232	The E. W. Vanduzen Co.	233
Evens & Howard.	231	The Union Hardware Co.	233
International Correspondence Schools.	235	The Jeffrey Manufacturing Co.	230
Indiana, Decatur & Western	235	The Rockwood Mfg. Co.	233
Illinois Central R. R.	234	Vandalia Line	234
		Westbrook & Wells.	232
		Small Ads., Wanted, For Sale, Etc	

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

Why Not

BUY a STANDARD when in need of a Brick Machine. We guarantee them to make as many first-class brick as any machine of its class on the market.

Our Mould Sander is a practical machine and will last for years—do not compare it with those cheap, flimsy machines now offered to the trade.

If in need of supplies or machinery write us before placing your order.

DEERFIELD, MICH., August 28, 1897.

The Horton Manufacturing Company, Painesville, Ohio:

GENTLEMEN—I have been using your Iron Standard Machine since early in the spring of '97, and can say that it is the best machine that I ever saw. Have not been to one dollar's expense for repairs and it does not show any perceptible wear in any of its parts. It is simple in construction and needs no attention. We are making one of the finest brick in the State of Michigan, and can recommend your machine to any one wanting a first-class machine. We are making at the rate of 30,000 per 10 hours and could make as many as any set of hands could take care of by speeding up the machine.

Yours very truly,

W. T. ATKIN.

FOR SALE—About 200 feet of 5" x 1 1/4" kiln bands. Ends are arranged for tightening screws. Second hand eight horse power portable engine and boiler on skids; is in good condition.

Second hand Quaker horse power machine; nearly all new and in good working order.

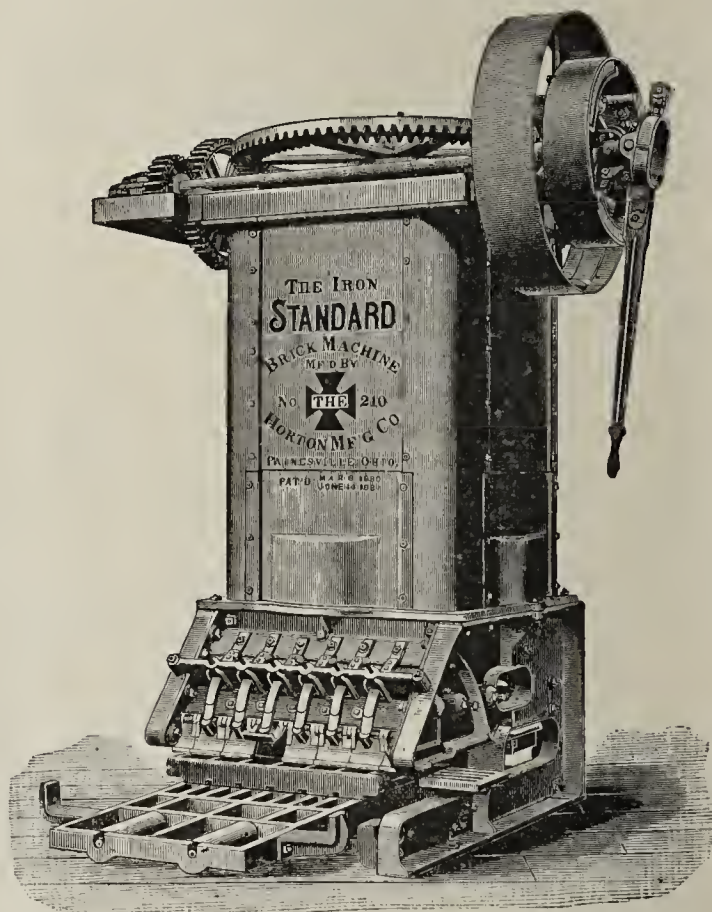
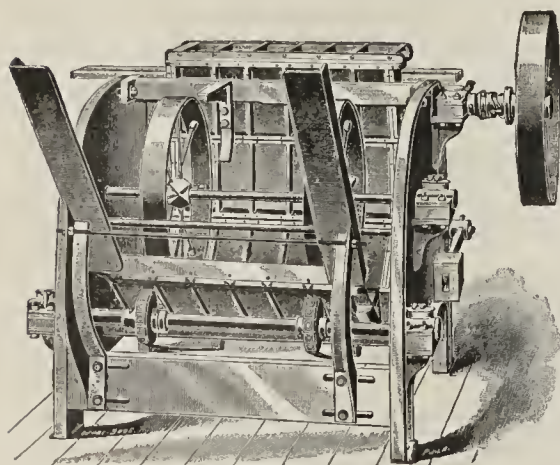
The above articles will be sold very cheap for spot cash.

One second hand Columbian Special Repress for sale at a very low figure. Practically as good as new.

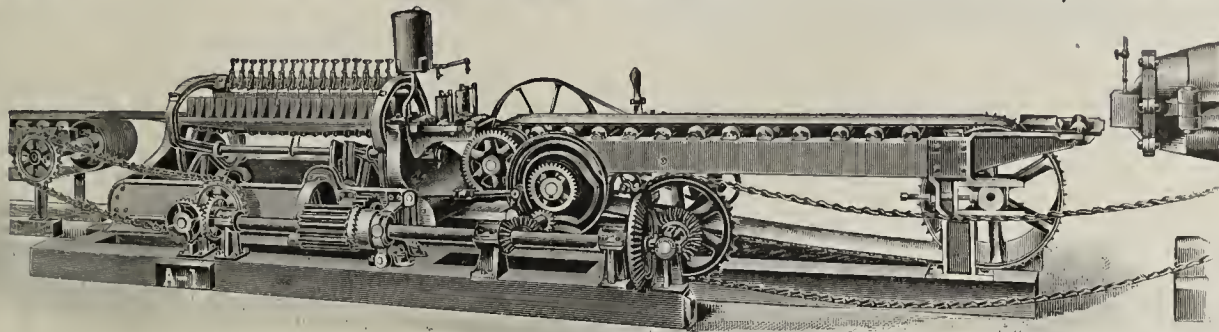
The Horton M'f'g. Co.,

Mention the Clay-Worker

PAINESVILLE, OHIO.

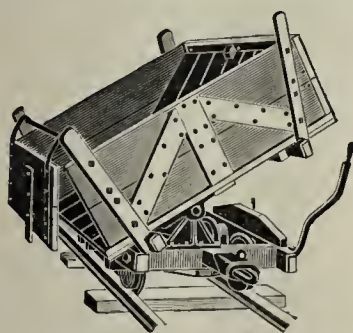


Yes Sir-ree! We Make 'em all, We do!

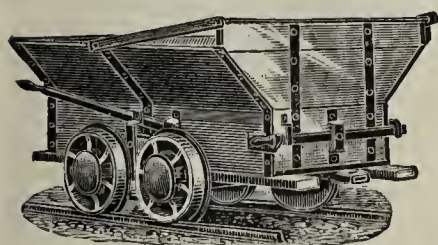


Automatic Side Cutting Table.

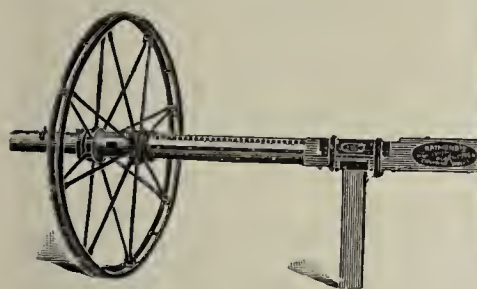
An' we make a whole lot more besides,



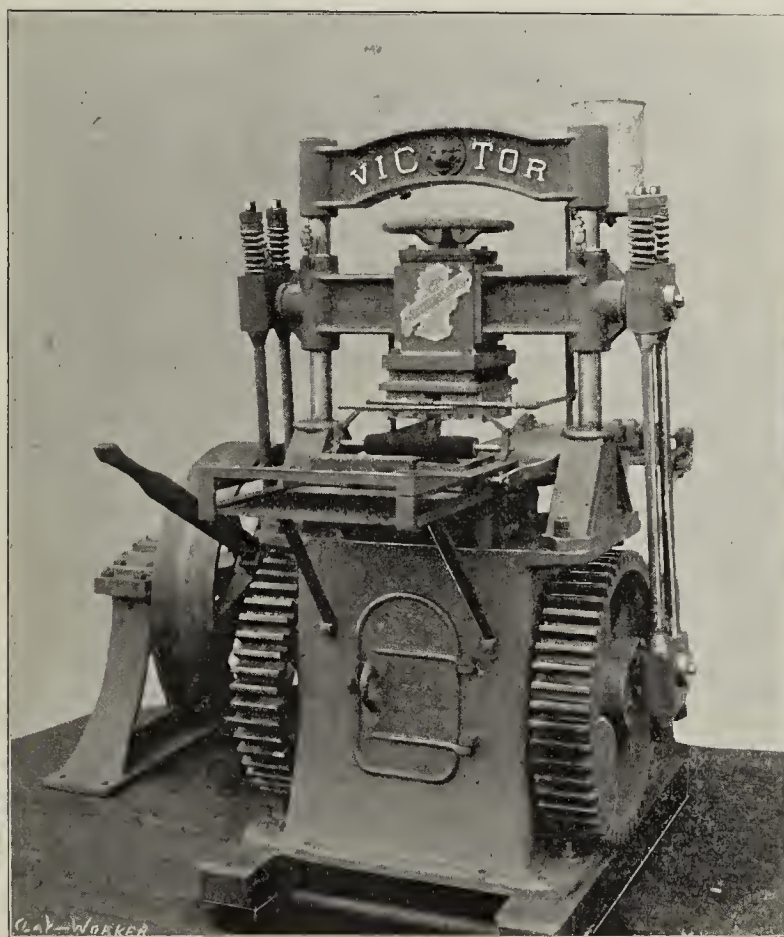
Automatic Dumping Car.



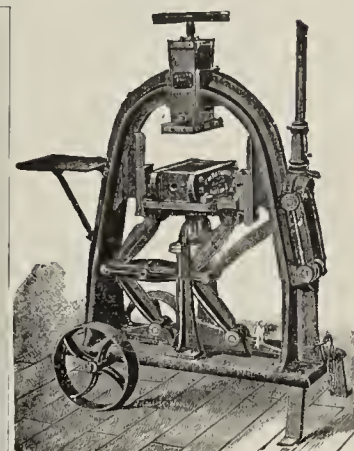
Bottom Dumping Car.



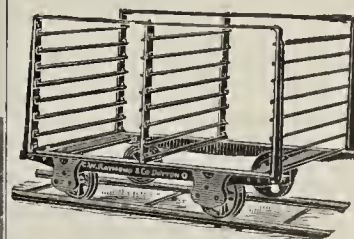
Wrought Iron Tempering Wheel.



The Raymond "Victor" Repress.

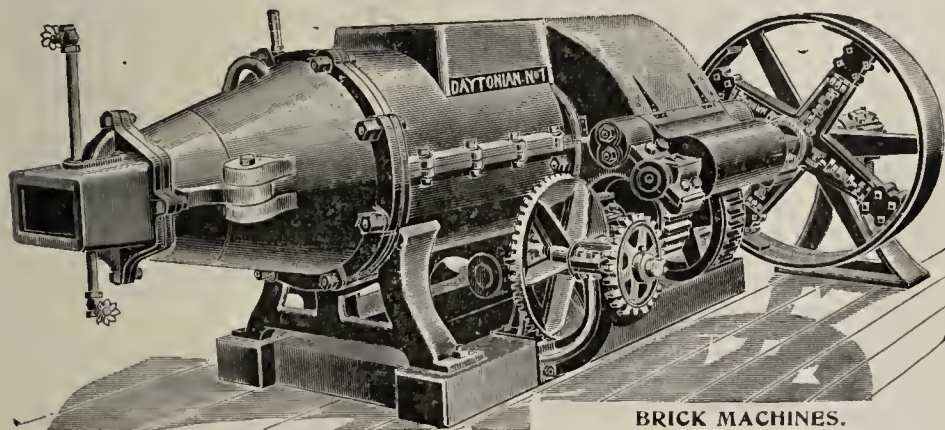


Perfection Brick Press.



Dryer Cars.

Ef you don't believe it just send for our catalogue.



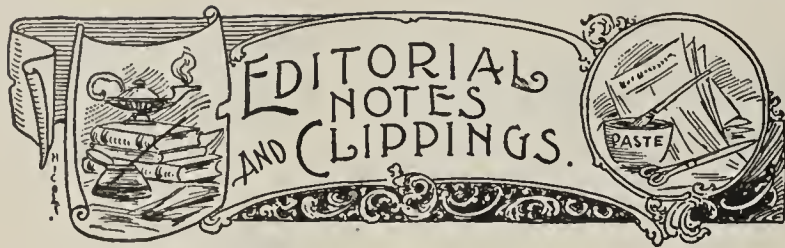
BRICK MACHINES.

We Sell 'em too like hot cakes.

...

**C. W. Raymond
& Company,**

Dayton, Ohio.



Calvert, Tex., is to have a new brick plant.

A new tile factory is to be erected at Mount Holly Springs, Pa.

Curtis Janelle has purchased the brickyard of Carlisle Bros., at Exeter, N. H.

C. C. Godfrey, Fort Payne, Ala., is preparing to develop the kaolin mines of Eureka, Ala.

The brick, tile and pottery works of H. L. Orcott, Monroe, La., were destroyed by fire recently.

The Waco (Ky.) Brick and Tiling Company has increased the wages of its employes 10 per cent.

Juo. Haynes has purchased the interest of Jasper Shear in the brick and tile plant at Brook, Md.

A brick plant will be established on Col. John McKee's land at McKee City, N. J.

A slight damage was caused by the burning of some kiln sheds at Eckersou's brickyard, at Haverstraw, N. Y.

Jno. C. Greer, 411 West Fifty-sixth street, New York city, would like to receive catalogues of brickmaking machinery.

The Ridgway (Ill.) Brick and Tile Works were destroyed by fire Aug. 16. It is supposed to have been the work of tramps.

Reese, Hammoud & Co. have commenced the erection of a new plant at Bolivar, Pa., with a daily capacity of 30,000 brick.

Fire partly destroyed the brick and tile factory of J. D. Rumsey, Stryker, O., Aug. 28. Mr. Rumsey will at once rebuild.

The Chester Pottery Company is making extensive improvements in its plant at Phoenixville, Pa., in order to enlarge the output.

Hannett & Sons, Newburg, Ore., report brick business as booming, owing to the large amount of building going on in that vicinity.

Jos. Clark, Mount Bridges, Ont., is building a large addition to his brick plant in order to meet the increased demand for his product.

The works of the Stewart Brick Company, Parkersburg, W. Va., are closed on account of a strike for higher wages by the employes.

J. C. Africa advises us that he expects to start a small brick plant at Jellico, Tenn., and would like to purchase a second-hand outfit.

Reports from South Omaha, Neb., indicate a boom in the brick business. The yards there and at Avery, Neb., have run night and day to fill orders.

The Dickson & Wook Brick Works, McKeesport, Pa., were burned to the ground at an early hour Sept. 6. Supposed to have been started by incendiaries.

A number of employes at the Bennett Brick Company's yard, near Muncie, Ind., were struck and quite seriously injured by falling brick from a kiln they were setting.

The brickyard of Wm. P. Wright, Clayton, Del., was badly damaged by a storm. Several kilns were destroyed, and more than 20,000 brick, ready to be burned, were ruined.

It is rumored that W. W. Green, a contractor and builder, of Philadelphia, has purchased 400 acres of clay land near Northeast, Md., on which he will erect a brick plant.

Wm. Valk and C. Schmeidsburg, employes, were caught in a cave-in of clay at the yard of the Norfolk (Neb.) Brick and Tile Company, and both were quite seriously, if not fatally, injured.

Cyrus M. Mason, aged eighty-six, died at Crown Point, Ind., Aug. 17. He was among the first white men to locate in Lake county, and is said to have manufactured the first brick in Indiana.

E. D. Lauterbach, Bushnell, Ill., whose brick plant has been closed down for some time, in renewing subscription to the Clay-Worker, says he expects to be running full blast again before long.

H. W. Hossfeld, of Clermont, Ia., has had the clay on his land, near Lester Park, Ia., tested, and it makes a fine red

pressed brick. Mr. Hossfeld will establish a brick plant to develop the clay.

A syndicate, of which S. H. Yeakle, of Allentown, Pa., is the head, is being formed to manufacture brick. It is the purpose to purchase at sheriff's sale the property of the Upper Merion Brick Company.

Canton, says the Warren (O.) Chronicle, leads in the production of brick in northern Ohio. The output annually is from 18,000,000 to 20,000,000. It takes about 4,000 cars to convey the bricks to their destination.

W. R. Meraditu, of Cool Spring, Pa., is contemplating the establishment of a brick plant at Camprun, Pa., where he has discovered a fine vein of fire clay, which has been tested and makes a fine building brick.

Elias Petts, Shreveport, La., writes that Mrs. Jennie Oliff will carry on the brick business of her husband, the late Lewis Oliff, with Mr. Petts as Manager. We extend to Mrs. Oliff our heartiest wishes for her success.

A terrible boiler explosion occurred at W. R. Halliday's brickyard at Cairo, Ill., Aug. 23, which resulted in the loss of several lives, while a number were seriously injured. The cause of the explosion is unknown.

The West End Brick Company, Allentown, Pa., has secured an order for 1,000,000 brick for a new chemical works at Bound Brook, N. J. This, with the other orders already on hand, will keep them running full-handed for some time to come.

The Dickey Tile Works, at Deepwater, Mo., were completely destroyed by fire Aug. 20, entailing a loss of \$100,000. The plant was the largest of its kind in the West. The origin of the fire is unknown. The plant will probably be rebuilt.

The Hamburg (Pa.) Vitrified Brick Company, which heretofore has manufactured building brick as well as paving brick, sold all the machinery for manufacturing the former, and will in the future devote their entire attention to paving brick.

Citizens of Tyrone, Pa., are happy over the prospect of a new brick plant at that place. A. C. Moyer, an old-time brick manufacturer, is agitating the new project. The clay in that vicinity is good, water is abundant and coal within easy reach.

Jos. S. Lusk, 61 Pine street, New Castle, Pa., writes that he desires to purchase a good second-hand dry press having a daily capacity of 10,000 or more brick. Any one having such a machine for sale will please address Mr. Lusk direct, stating price.

Wm. Bryan, an employe at Burford's Pottery, East Liverpool, O., was caught in a belt and had his arm torn off at the elbow. It was feared the man would bleed to death before a surgeon could be secured, but by diligent work his life was saved.

The Renovo (Pa.) Fire Brick and Clay Works have been chartered, with a capital stock of \$100,000. The incorporators are P. H. Sullivan, of Renovo; John F. Bickel, of Morton, Pa.; Charles W. Potts, Joseph L. Rutter and Ellis Ames Ballard, of Philadelphia.

A large barn occupied by Davis & Kilkenuey, brick manufacturers, at Utica, N. Y., was burned to the ground recently. Fortunately, the fire occurred at a time when the horses were all out of the barn, so nothing was lost but a large amount of hay and some harness.

Mr. Potvin, a brick manufacturer of Plaistow, N. H., has closed his factory for the purpose of sending his men to Alaska to prospect for gold. Mr. Potvin agrees to pay all expenses for a year, and the men are to divide up equally with him what they make.—Exchange.

The Briesenick Foundry and Machine Works, Brunswick, Ga., advise us that they are in correspondence with several important manufacturers with a view of securing the agency in the South Atlantic States for vitrified brick and other special and fancy lines of clay products.

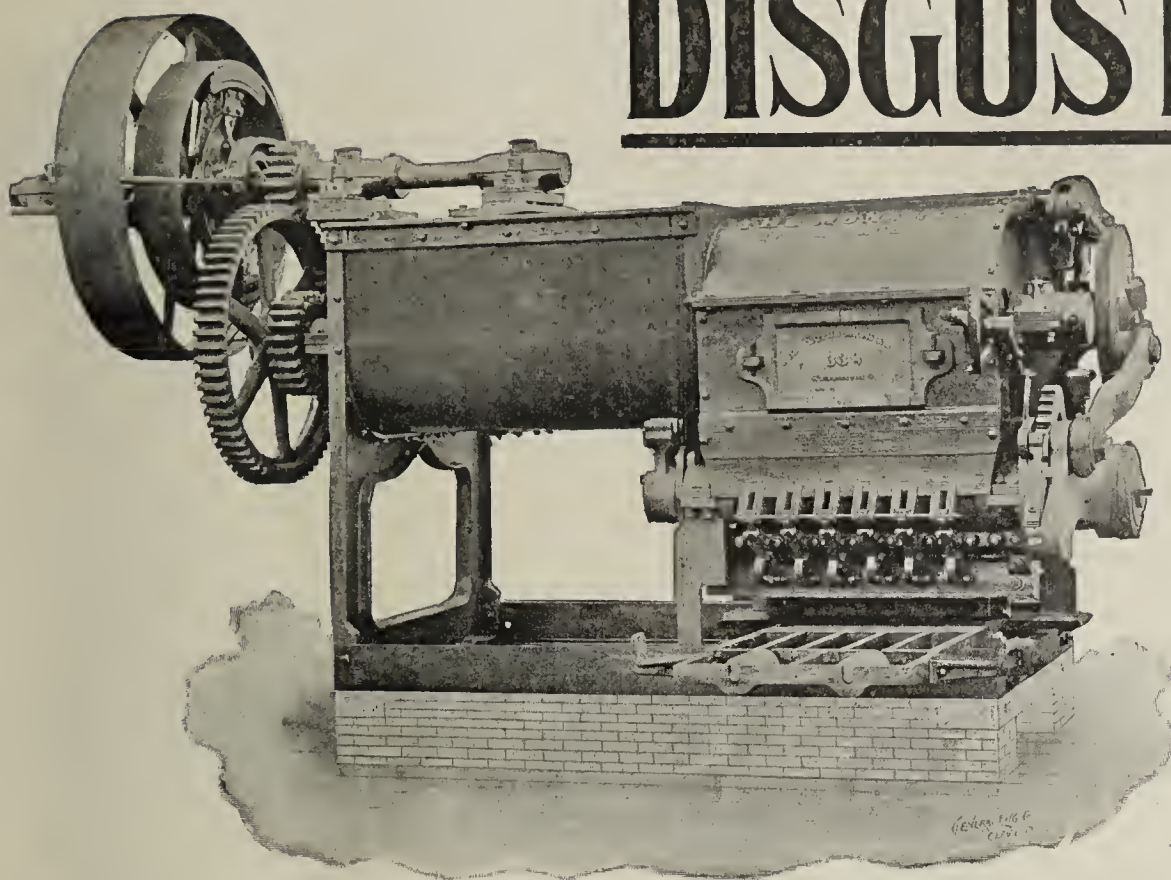
The Hamilton (O.) Tile and Pottery Company has been incorporated, with a capital stock of \$250,000, to manufacture tile, pottery and ceramic novelties at Hamilton. The incorporators are Otto Metzner, Charles L. Cornell, Ernest G. Ruder, Edgar A. Belden and John B. Cornell, Jr.

Two men who had been discharged by Richard Murray, a Berlin (Conn.) brick manufacturer, returned to the works one night after the workmen had gone home and slashed the belts to the machinery, doing damage to the amount of \$100. The men were arrested and fined by the court.

The Leader Manufacturing Company, Decatur, Ill., write that their trade is now quite satisfactory. Their power presses are making exceptionally good records wherever used.

[CONTINUED ON PAGE 224.]

DISGUSTED



And wanting to kick themselves, have been several parties lately who bought machines, sanders, moulds or other supplies without getting OUR prices when they learned what they were.

Don't You Do It.

We don't claim to be "the only pebbles on the beach," but as we are one of the FEW firms who have been **LEADERS** (in every sense) for nearly a generation,—

Common sense will surely prompt you to know what we can do

NOW.

Prices on some goods were never so low.

The "Monarch"

Horizontal; with Double Pug Mill and Double Presses, and other valuable features contained in no other.

The "Iron Quaker"

Upright; simplest, best and lowest priced of any real competitor.

These two machines are unquestionably the leaders of their kind.

AUXILLIARY MACHINES AND SUPPLIES.

Pug-Mills, Disintegrators, Crushers, Mould-Sanders, Represses, Winding Drums, Dump Cars, etc., Moulds, Dump Tables, Dryer Cars, Kiln Doors and Castings, Elevators, Dump Carts, etc., etc.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE.

Odd sizes of moulds. Have not been used.

5 moulds, $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{8}$. 9-16 inch partitions.
20 moulds, $8\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{1}{2}$. 9-16 in. partitions.
12 moulds $9\frac{5}{8} \times 4\frac{3}{8} \times 2\frac{1}{2}$. $\frac{1}{2}$ inch partitions.

Second-hand, but used a few days only.

10 moulds, $9\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
19 moulds, $9\frac{1}{2} \times 4\frac{3}{8} \times 2\frac{1}{2}$. "
16 moulds $9\frac{1}{4} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 inch partitions.
16 moulds $9 \times 4\frac{1}{2} \times 2\frac{1}{2}$. 9-16 inch partitions.

The Wellington

Machine Co.,

WELLINGTON,

OHIO.

Send
for
Circular.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

They anticipate an increased demand for tile machinery and supplies, and are fully prepared to meet it. Their brick and tile machine, a cut of which may be seen on page 243, is, indeed, a leader.

The A. D. Jones Sewer Pipe Works, Zanesville, O., burned Sept. 11. The loss is estimated at \$50,000, with \$22,000 insurance.

Jas. R. Miles writes that he has purchased the works of the Kennett Brick Company, West Chester, Pa., and will operate same.

The Missouri Fire Brick Company, St. Louis, Mo., has been incorporated by Jno. B. Holman, Jno. J. Owens and Jos. B. Walsh. Capital stock, \$25,000.

The McAvoy Vitrified Brick Company, Philadelphia, Pa., has been awarded a contract for paving the streets of Norristown, Pa. This will require something like 6,000,000 brick.

The Indianapolis Terra Cotta Works is enjoying a season of prosperity. The plant is running full time, with a full force of employees at work. The prospects for fall trade are very good. Business is better than it was last year.

The brick manufacturing firm of Jno. Tempest & Co., Courtney, Pa., and the owners of the brick plants formerly operated by the Watson Mining and Manufacturing Company, Gallatin, Pa., have consolidated under the title of the Tempest Brick Company (L't'd), with general offices in Pittsburgh.

The County Commissioners of Waco, Tex., are contemplating making the experiment of manufacturing brick at the County Convict Farm. Superintendent Shepard says a number of the men confined there are practical brickmakers, and the farm itself abounds in clay of a quality to make fine brick.

Chas. G. Kuntze, Sr., the senior member of the pottery firm of Kuntze & Son, Lima, O., died at his home in that city Sept. 1. Mr. Kuntze was in his eightieth year, and the oldest actual working potter in Ohio. A local paper, speaking of his death, says: "Lima has lost one of her best and most industrious citizens."

In a recent letter Chas. Berrick, Buffalo, N. Y., asks us to state that he is not in any way connected with the new brick plant to be erected at Attica, N. Y. Mr. Berrick says: "I have been flooded with inquiries regarding same, and therefore ask that you inform your subscribers that I am in no way connected with this venture."

A fine bed of clay has been discovered at Ogden, Utah, that is specially adapted to the manufacture of sewer pipe, drain tile and paving brick. A committee composed of J. B. Twiford, A. T. Wright and Wm. Glasmann has been appointed to investigate affairs, and it is very probable that a large clayworking establishment will soon be erected.

The Hamilton (O.) Tile Works have passed into the possession of E. G. Ruder and John and George Cornell, who will, as soon as possible, reopen them and begin the manufacture of the finest kind of tiling. Jardinieres will be their specialty, and of these they will manufacture every kind, from the plainest to the most elegantly decorated.

The Dagus Clay Manufacturing Company has been chartered to manufacture and sell brick, tile, sewer pipe, terra cotta and other clay products at Dagusahonda, Pa. The incorporators are J. J. Hoblitzell, of Meyersburg; W. S. Ravenscroft, S. A. Rote, M. S. Kline and John G. Whitmore, of Ridgeway. They have a capital stock of \$60,000.

The clay land in the Mutton Hollow district, owned by Arthur E. Berry, has recently been sold by the owner to P. L. Ryan, Woodbridge, N. J., who will develop this mine promptly. Mr. Ryan is one of the most extensive shippers from this point, and is at present controlling three different mines, in which are contained the most superior grades of fire brick, pottery and terra cotta clays, etc.

The Anderson (Ind.) Foundry and Machine Company, a few days ago, billed a brick machine through to Kingston, Jamaica. This is the fourth machine they have shipped to that country. They are building up a big foreign business. South America is proving a very good market. They have also been shipping machines to European countries, coming into direct competition with the foreign manufacturers.

The brick manufacturers of western Pennsylvania have reorganized their organization known as the Western Pennsylvania Brick Exchange, with headquarters in Pittsburgh, Pa. The Exchange includes all the prominent brick manufacturers of western Pennsylvania. The proposition to establish a Brick Manufacturers' Association at this time was prompted by the recent improvement in business. One of the representatives present stated that the price of bricks has fallen so low that there is no profit in their manufacture. Cutting of prices has

been carried on to such an extent during the past two or three years that the market has been almost ruined. By the establishment of an association it is proposed to take advantage of improving business, fix uniform prices and place the trade on a healthier basis. The Clay-Worker wishes them success and long life.

Mr. F. G. Lotterer, the well-known clayworker, of Fort Scott, Kan., writes that he has selected a site for a brick plant in the gas belt, at Cherryvale, Kan., where he will build an extensive manufactory. He thinks he has a fine deposit of shale clay. He would like to purchase second-hand dry pans and a lot of anti-friction dry cars; also clay elevators and sliding screens and other brickyard appliances.

During a heavy storm at Woodbridge, N. J., the Salamander Brick Works, about four miles out, were flooded. The water undermined the large kiln, permitting the fire in the kiln to get against the side of the building, and set it on fire. The factory was burned to the ground, and it is estimated that the damage will be in the neighborhood of \$50,000. A large number of workmen are thrown out of employment.

The demise of Jno. A. Hutchins, the well-known terra cotta manufacturer, of Wyoming, Pa., occurred Aug. 23. Mr. Hutchins was in his usual health until three days before, when he was suddenly stricken with hemorrhage of the stomach and rapidly grew worse until death relieved his sufferings. He was one of the most widely known men in the Wyoming valley, and was eminently respected by all who knew him.

The Henry Martin Brick Machine Manufacturing Company, of Lancaster, Pa., has just purchased the entire business of the old firm of S. P. Miller & Son Company, of Philadelphia, which was established in 1812 and continued on the premises ever since. All the patterns of the well-known "Miller" hand and steam represses, as well as all the patterns of tempering wheels, etc., have been transferred to the factory at Lancaster, where duplicate parts can be secured promptly.

In speaking of prospects for future business, E. D. Keplinger, Manager of the Imperial Shale Brick Company, Canton, O., says: "I never saw brighter promises for our business, and you will understand that this opinion is not merely a prospective one when you know that we have just cleared our yard of over a million pavers accumulated before the coal strike set in. We expect to run our works all winter, which we have not done for years, and the general indications, so far as I can learn from other dealers, are equally promising."

Jno. C. Griffiths, Attica, N. Y., writes that the clay at that point has been thoroughly tested and found to be suitable for making a fine grade of building material as well as good paving brick. A company, to be known as the Attica Brick and Tile Works, has been formed, and will begin operations this fall, putting in a Martin machine, and will only make common building brick to start with. Mr. Griffiths says: "Next year is another story. Abundant capital is back of the plant, but 'we are going slow and learning to peddle.'"

The Hoosier Brick Company, of New Albany, Ind., have about decided to sink a gas well at their plant. They have been assured by a gas expert, members of the company say, that gas sufficient to run the plant can be obtained at a depth of 250 feet, although no very great pressure can be found at that depth. In deepening a well at the plant, not long ago, a pocket of gas was struck at a depth of about forty feet, and this, together with the assurance of a gas expert who recently visited the place, warrants them, they think, in making the investment of the small amount of capital required to drill a well to a depth of 250 feet.

In renewing their subscription for the year, the Kittanning Clay Manufacturing Company, Kittanning, Pa., write: "Brick-makers here have very little reason to complain, unless it be of low prices. The demand has been fair, and we hope that by another year prices will improve. Nearly all branches of business are picking up a little, and a general revival seems to be in the atmosphere. We have a very fine quality of shale clay, together with a vein of potter's clay, and also a fine clay vein which, in the proper combination, makes an excellent paving brick. We have also recently began the manufacture of drain tile."

WANTED—Situation as general manager, by a first-class Potter's Chemist with years of experience, understands all details of the business, can superintend and furnish formula's for the making of C. C. White Granite, Porcelain, Vitrified and Bone China, also all kinds of Colored Glazes for tile and brick. Bristol glazes for stoneware. Highest references furnished as to ability etc. Address
8 tf d m J. B., care Clay-Worker.

MICHIGAN COLLEGE OF MINES.

A State technical school. Practical work. Special facilities for men of age and experience. Elective system. 45 weeks a year. Non resident tuition \$150 a year. For catalogues, address
82 a DR. M. E. WADSWORTH, President, Houghton, Mich.



Read What

H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE, 60TH AND HAVERFORD STS.

TELEPHONE 147, W. P.

H. C. CARROLL & SONS, Brick Manufacturers,

Residence, 3831 Lancaster Avenue.

3 YARDS: { 57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell your troubles to"

The F. D. CUMMER & SON CO., Cleveland, Ohio.

There is Gold in Alaska!

Lots of it. Suppose you go after it! You leave no stone unturned in your efforts to attain it. You observe the methods of successful miners and hope by close imitation to duplicate their success.

Suppose you were to put these same tactics into use right here at home in making your brickyard pay. Suppose you were just as untiring in pushing every effort toward success. Suppose you would imitate other successful clay manufacturers and equip your plant with the latest and best machinery; wouldn't you stand a good chance of "striking it rich" right here at home and at the same time escape the privations and discomforts of Alaska. We think you would! What do you think?

Our machinery is the most modern and best line on the market. It gives better results. It gives more profits. Its made right and runs right. It never strikes or balks. When you want it its ready to throw on the belt and you may run it twenty-four hours a day without fear. We make our machinery better than others, but we ask no more for it. That's the reason our works—the largest of their kind in the world—have been running right along through dull times. If you want to know about the best machinery—the kind that "never disappoints"—write us, we will be glad to hear from you whether you want machinery now or not. We make everything used in the clay manufacturing business.

Make golden bricks right here at home with our automatic machinery. No diet of snow balls. No bed of ice. You don't get the "Frosty Finger" when you deal with us.



The American Clay-Working Machinery Co.,

Bucyrus, Ohio, U. S. A.



SOME REASONS WHY LAND SHOULD BE TILE DRAINED.

Thorough drainage is one of the most important means of increasing the productiveness of soils. Excessive moisture acts injuriously by keeping the land cold. The sun's heat, instead of being usefully expended in warming the soil, is wasted in evaporating the superfluous water contained in it, delaying quite often the cultivation of land until late in spring, thus jeopardizing the early starting of crops. Two thousand five hundred tons of water often fall upon an acre. In order to convert this liquid into steam or vapor the heat derived from the combustion of 372 tons of fuel would be required.

IN UNDRAINED CLAYS.

In case of stiff, undrained clays, the large quantity of superfluous water which annually descends upon them is chiefly got rid of by evaporation—a process effected by robbing the soil of the sun's heat, which is so indispensably requisite for the maintenance of the vigor of the cultivated plants. Heavy, tenacious loams and clays are rendered more porous and friable by drainage, and after that operation their tillage can be performed with less difficulty and expense. Undrained soils are converted by heavy rains either (in case of clays) into adhesive pastes, or (in the case of light lands) into puddles. On the contrary, a well-drained field will act, under such circumstances, like a water filter, through which the water readily passes without effecting any important alteration in the condition of the filtering materials. Undrained, stiff soils, when subjected to heavy rain and then to strong heat, acquire a crust so hard that it is difficult to penetrate it. We have seen seeds and potato sets so firmly baked up in an undrained, tenacious clay that their vital powers were quite destroyed.

Unwelcome semi-aquatic plants often spring up in land which is badly drained, and they frequently succeed in overcoming and displacing no inconsiderable proportion of the plants under cultivation. When a marshy field is drained the useless semi-aquatic plants spontaneously disappear.

The organic matter in wet soils decomposes very slowly because of the exclusion of air. When by drainage the soil is rendered porous, the atmospheric oxygen penetrates to the organic matter and converts it more expeditiously into water, carbonic dioxide and ammonia—the substances that furnish to the vegetable the greater portions of its food. Every farmer knows that a wet field requires more manure than a drained one; in the former the manure remains much longer in an inert condition.

The water drained off from soils contains fertilizing matters, more particularly compounds of nitric acid and so-

dium salts. The important fertilizing substances—ammonia, potash and phosphoric acid—are retained by the soil with great tenacity, and, on the whole, the water which passes off from cultivated soils carries with it but very small quantities of the food of plants. On the other hand, the soil is continuously receiving ammonia and nitric acid from the atmosphere.

The fertility of soils is in general but little influenced by the arts of man, but by understanding them they can be so used and adapted to produce good crops. It is possible to greatly improve the capabilities of inferior land, and fertile soils go out of condition where their cultivation is not properly attended to.

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cent a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE—Three "Chief" brick machines. For particulars address 91 cm P. O. BOX "N," Savannah, Ga.

WANTED—Situation as foreman of a tile factory. Understand the business thoroughly, and can give satisfactory references. A Southern location preferred. Address A. GOODMAN, 91 d Care Clay-Worker.

A BIG BARGAIN.

For sale cheap—a well-equipped brick plant in Northern Wisconsin; no other plant within 50 miles; clay burns red and there is an abundance of it; good railroad facilities, forty acres of clay land and large amount of timber suitable for fuel. A fine opportunity for a young brickmaker to start for himself. For full particulars, address 7 t f d WALLACE, care Clay-Worker.

WANTED—Situation as foreman on a brickyard by a young man who can give references as to character and what he knows. Address J. W. WOLFLEY, 91 L Delaware, O.

FOR SALE—Three-mold Boyd press; 42-inch Steadman; screens and complete outfit for dry press but little used. Clay unsuitable. THE DAYTON BRICK CO., 91 c Dayton, O.

WANTED—Position as foreman or burner in dry press or mud brick plant. Experienced with down-draft, up-draft and continuous kilns. Best references. Address A. A., 91 c Care of Clay-Worker.

WANTED—Situation as superintendent of dry press or stiff mud yard; 15 years' experience; erect kilns and machinery. Best of reference as to ability. If you cannot dry your bricks successfully, write me. Address HARD BRICK, 1416 Penn. Ave., N. W., Washington, D. C. 91 cm

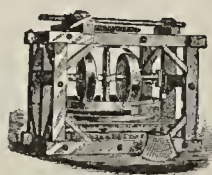
WANTED—Situation in a pottery by a young man who understands the chemistry of clayworking thoroughly. A permanent situation where there will be an opportunity to advance more important than salary. Address UNDERGLAZE, 91 L Care Clay-Worker.

WANTED, SITUATION—Enameled bricks, bathtubs, sinks, etc. Practical man seeks situation as maker of above goods. References covering ten years. Excellent recipes. Desire to demonstrate ability in preference to demanding large salary. Address ENAMEL, 91 cm Care Clay-Worker.

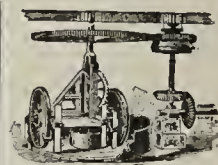
SITUATION WANTED—As business manager or salesman for manufacturer of front brick. Have had over ten years' experience as a dealer. Am thoroughly up in selling and handling all makes of pressed, repressed and enameled goods, and large acquaintance with architects over the country. Address C. B. A., care Clay-Worker.

A GOOD OPPORTUNITY.

A large bed of yellow and red clay, besides 200 acres of black clay. The owner will give free 25 acres to any one starting a brick manufactory on the ground; 2½ miles from C. J. R. R.; 28 from Philadelphia. Sample of clay and particulars. C. LE DUC, 91 d South Park, N. J.



Dry Pan.



Clay Mill—Harp Pattern.

THE TURNER

VAUGHN & TAYLOR Co.
CUYAHOGA FALLS, OHIO, U.S.A.

MANUFACTURERS & EXPORTERS OF **CLAY WORKING MACHINERY.**

WIRE DRAWING
MACHINERY.
CHAIN MAKING
MACHINERY.

SHODDY AND
RUBBER
WASHING
MACHINERY.

POWER TRANSMITTING MACHINERY.

PULLEYS & GEARING.
CRANES
HEAVY CASTINGS
GRAIN CLEANING MACHINERY.
ROPE TRANSMISSION
HOLLOW TUBING MACHINERY.
AND
CONTRACTORS FOR
COMPLETE PLANTS.

Flower Pot Machine.

Vaughn Press—Sewer Pipe.

BRICK CARS

30 Different Styles,

Let us Save You Money.

The
Run
Easy
Kind.

Walworth Run Foundry Co.,
CLEVELAND, OHIO.

Conveying, Elevating and...
Power-Transmitting Machinery.

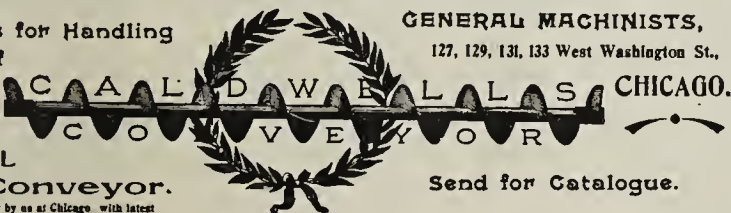
H. W. CALDWELL & SON CO.

Specialties for Handling
Material of
all Kinds.

GENERAL MACHINISTS,
127, 129, 131, 133 West Washington St.,
CHICAGO.

CALDWELL
Steel Conveyor.

Manufactured exclusively by us at Chicago with latest
improvements



Send for Catalogue.



CALDWELL-AVERY BEAM-
LESS STEEL ELEV-
ATOR BUCKETS.

LINK BELTING.
SPROCKET WHEELS
COTTON BELTING.
RUBBER BELTING.
LEATHER BELTING.
BELT CLAMPS.
ELEVATOR BOLTS.
ELEVATOR BUCKETS.
CONCRETE MIXERS.
FRICTION CLUTCHES.
JAW CLUTCHES.
COUPLINGS.
FLEXIBLE SPOUTS.

GEARING (all kinds.)
ELEVATOR BOOTS.
HANDERS.
PERFORATED METALS.
PILLOW BLOCKS.
IRON PULLEYS.
WOOD PULLEYS.
SHAFTING.
SET COLLARS.
SWIVEL SPOUTS.
TAKE-UP BOXES.
TURN HEAD SPOUTS.
WIRE CLOTH.



FOR SALE—75,000 second-hand 34-inch
pallets; price, 3 cents each on cars,
Buffalo. J. F. STENGEL,
93c 928 Ellicott Square, Buffalo, N. Y.

FOR SALE—Boiler, engine and brick ma-
chinery, located in Iowa. For sale
very cheap. Address A. J. B.,
73c Care of Clay-Worker.

FOR SALE AT A BARGAIN—One 4-mold
Boyd dry press brick machine in per-
fect condition.
THE FERNHOLTZ BRICK PRESS CO.,
8tf1 St. Louis, Mo.

FOR SALE—One complete overgeared 8-
foot dry pans, with 48-inch pulley, en-
tirely new. For particulars inquire of
SMITH & CAFFREY,
74dm Syracuse, N. Y.

NO DRY PRESS Brick Plant complete
without the Carmichael Clay Steamer.
T. W. CARMICHAEL,
Inventor and Manufacturer,
6tf1d Wellsburg, W. Va.

WANTED—Situation as superintendent
of a paving or building brick plant.
Know how to operate and manage both,
and am familiar with all kinds of machin-
ery, driers and kilns. Have had years of
experience, and am thoroughly reliable.
No bad habits. Address BOX 88,
6tf1d Care Clay-Worker.

FOR SALE — Brickyard, completely
equipped; capacity, 25,000 soft mud
brick per day. Is now in operation, mak-
ing the best brick made in Columbus, O.
Yard on paved street and near railroad
switch. Have four down-draft kilns, of
75,000 capacity each, and one outside kiln
of 400,000 capacity. Great bargain to good
man. J. A. McAULEY,
8tf5pm Columbus, O.

FIRE BRICK MANUFACTURERS de-
siring services of a thorough, prac-
tical superintendent will oblige by address-
ing advertiser, who has had large experi-
ence in the management of important
works manufacturing first-class fire brick,
silica brick, furnace blocks, tiles, etc., also
front and paving brick. Advertiser is thor-
oughly acquainted with all methods of
manufacture and machinery connected
with the trade, including both dry press
and auger machines, also continuous kilns
using coal and producer gas, and different
patterns of down-draft kilns. First-class
references. Address

71d SUPERINTENDENT,
Care Clay-Worker.

FOR SALE, CHEAP.

The St. Joe Brickyard, situated on the
Northeastern-Queen & Crescent Railroads,
thirty-five miles north of New Orleans.
Completely equipped in every respect. Ca-
pacity, six million brick per year. Is now
in operation. Can be bought for less than
one-third original cost. The machinery all
in first-class condition. A good money-
making plant. Offering for sale because
too far to give personal supervision. Ad-
dress WM. GARIG,
7410pm Baton Rouge, La.

FOR SALE.

3-ton Trenton Iron Co. Incline hoist for
conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, 1/2 screen
and bucket elevator, with 20 6-inch buckets,
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
1 Barr Pumping Company steam pump.
1 Chambers Bros. Company brick ma-
chine.
All new or little used, and in excellent
condition. WALNUT,
5tf1d Care Clay-Worker.

Mention the Clay-Worker

When writing to Advertisers

Mention the Clay-Worker

THE
HOT BLAST
APPARATUS
FOR
DRYING
BRICK
TILE AND
TERRA COTTA

American Blower Co
SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

SEND FOR CATALOGUE

FOR SALE—Brickyard at St. Johnsville, N. Y., complete, with down-draft kiln, pug mill, auger machine, boiler and engine, racks, barrows, tables, sheds, all ready for business, and an abundance of clay, on easy terms. For the right man this is as good as a gold mine. For particulars inquire of

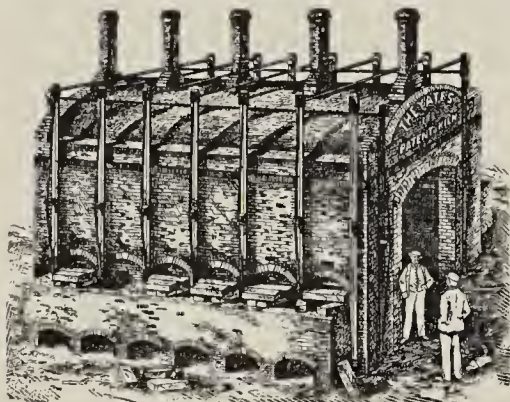
83 dc ROTH & ENGELHARDT,
St. Johnsville, N. Y.

FOR SALE.

40 acres of land, with a tile factory, saw-mill, fence machine, four dwellings, with well, gardens, smokehouses and other outdoor buildings. This factory is a large one, four stories high, with two kilns, located nine miles from nearest railroad point, twelve miles east of Fowler, the county-seat of Benton county. This location cannot be beat for making and selling tile in the State; good tile dirt, and plenty of it. Sawmill, saws and fence machine all doing good business. Also, blacksmith shop and tools. A splendid location for store and postoffice, also for feed mill. This location for the above-named industries can't be beaten anywhere. Will sell at a bargain to the man who has the money.

For further information address
L. B. JOSSERAND,
Pleasant Ridge, Ind.

73 c



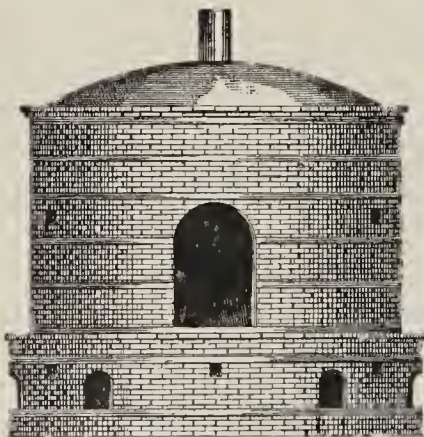
For Economy of Fuel and Percentage of Hard Burned Brick.

This kiln has no equal, I will be glad to tell you all about it.

ALFRED YATES, Johnsonburg, Penn.

AN IMPROVED MUFFLED KILN

For Burning Terra Cotta, Fine Front Brick, Enameled Brick, Encaustic Tile, etc., etc.



THIS IS the best and cheapest kiln in the long run. It is guaranteed to do its work in a perfect and even way. There is no loss in burning with this kiln. Every piece put in comes out perfectly burned, whether set in top or bottom. We have had many years' experience in building terra cotta, brick and tile kilns of different kinds, and can guarantee successful and satisfactory results, being practical kiln builders. Our terms are reasonable. Write for particulars, stating character and capacity of kilns desired.

F. HUNDT & CO.,
801 North Winchester Ave., Chicago, Ill.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in
United States, Canada
and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitri-fied Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
Marletta, Pa.

Chenoa, Ill.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

F. H. C. MEY,
Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



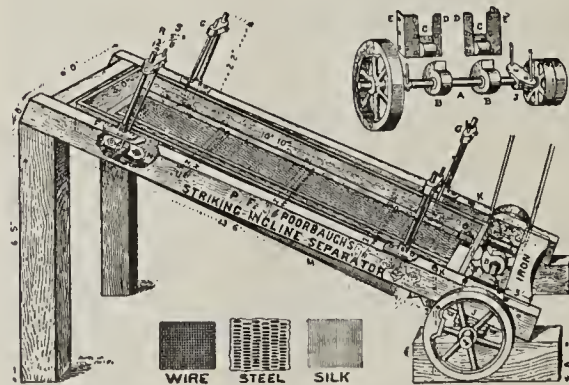
MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

STRIKING INCLINE SCREEN



For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.

• • • • •

These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

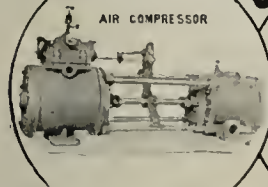
Manufactured by the

THE PITTSBURG MINERAL SCREEN CO.

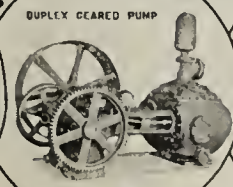
Write for Prices.

PITTSBURG, PA.

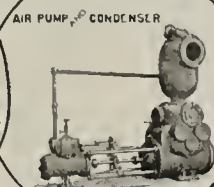
DEAN BROS. STEAM PUMP WORKS.



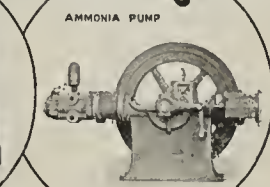
AIR COMPRESSOR



DUPLEX CASED PUMP



AIR PUMP & CONDENSER



AMMONIA PUMP

PUMPING MACHINERY
FOR ALL PURPOSES

INDIANAPOLIS, IND.

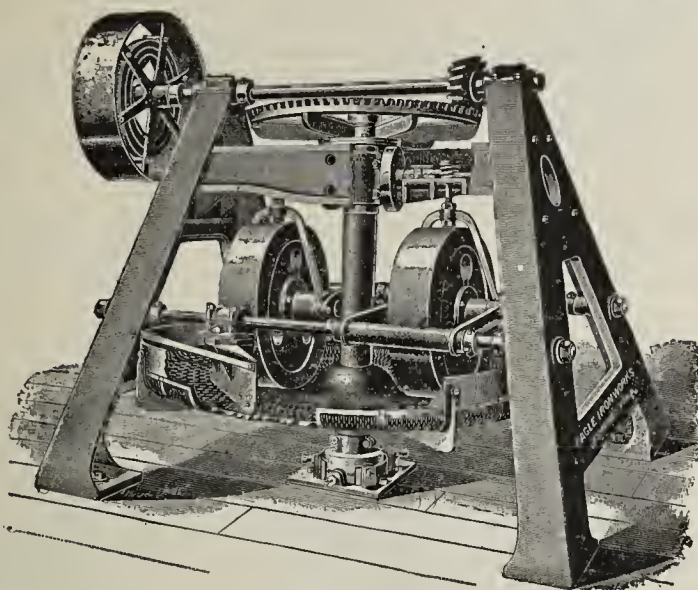
SEND FOR CATALOGUE
AND PRICES

OUR NEW 9 Ft. IRON FRAME DRY PAN

SEND for catalogue and read up on our patented features of this machine. Our motto in its construction and design is

"NOT HOW CHEAP.
BUT HOW GOOD."

EAGLE IRON WORKS, Des Moines, Ia.



"CENTRAL" BRICK REPRESS.

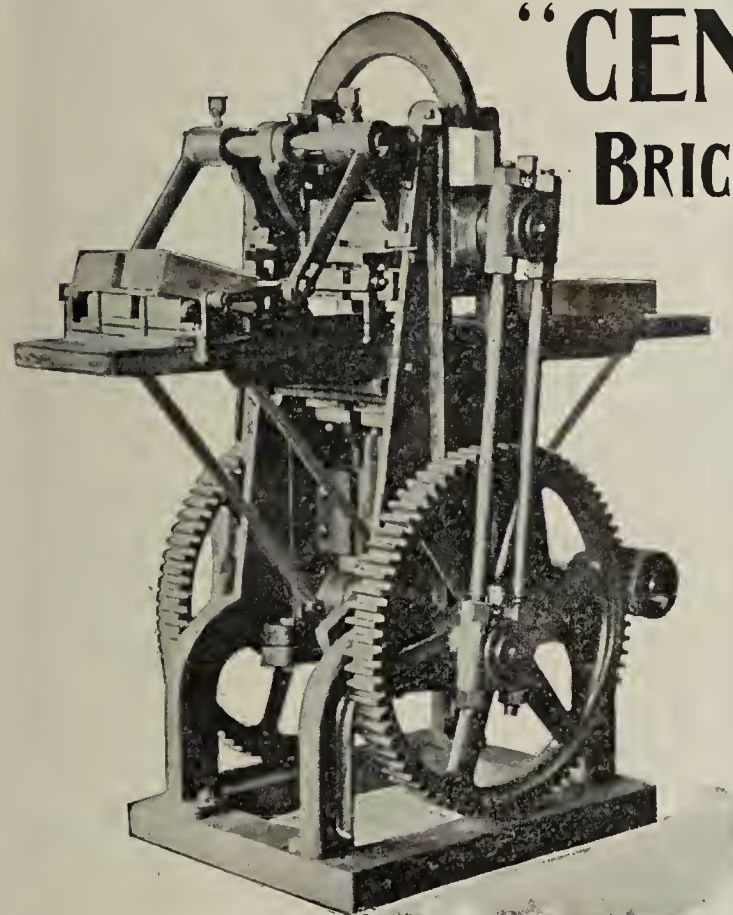
This cut shows our double die machine, which is acknowledged to be the simplest and best repress on the market.

It is no experiment, having been in use over two years with best results. Will do same work as others of twice the size and cost.

For particulars address

Central
Machine
Works,

236 Abbey Street,
Cleveland, Ohio.



We furnish all supplies and repairs for any make of the "SWORD" Brick machine.

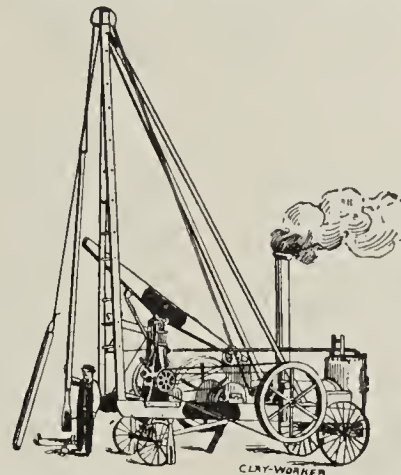
FOR SALE OR RENT.

Large brickyard at Spring City, Pa.; two brick kilns, 300,000 capacity; Monarch brick machine, capacity 25,000 per day; complete plant; best quality clay for common and pressed bricks; railroad siding, coal sheds and office. Address W. S. FURST, 83 md 738 Drexel Bldg., Philadelphia, Pa.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,
PERTH AMBOY, N. J.

Steubenville Foundry & Machine Works,

Established in 1820.

—Manufacturers of—

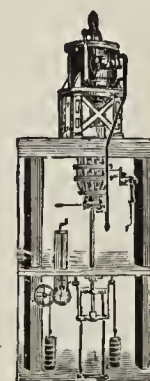
STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,

Making From 2 to 80-Inch Pipe Inclusive.

Pipe, Brick, Tile, Coping, Fire Proofing, and Building Block Dies.

Clay Grinding and Tempering Pans and Pug Mills.



FEED
SCREWS

FOR
MINING
CLAY.



STEAM
— ENGINES

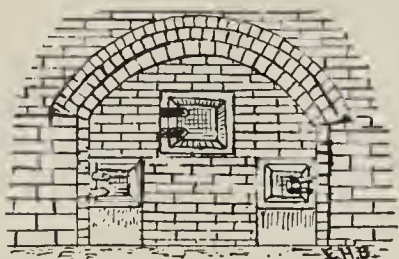
— AND —

Every Variety of Iron and Brass Castings Shafing and Pulleys.

Send for Circulars and Estimates.

JAS. MEANS & CO.,
Steubenville, Ohio.

Swift's Kiln Furnace.



F. E. SWIFT'S PATENT SLACK COAL COKER,
GAS GENERATOR AND SMOKE CONSUMER.

CAN BE ATTACHED to any kind or style of Up or Down-Draft kiln. Nothing but slack or waste coal used from start to finish of burn.



gate—I can save you good money. For further particulars, address

F. E. SWIFT,
Washington, Iowa.

The Keystone Brick Yard Supply Co.,

**Office and Works: 240 Arch Street,
LANCASTER, PENN.,**

MANUFACTURERS OF

Machine Brick Moulds

a Specialty.

With the latest improved machinery, and the best of skilled help and the very best material we are enabled to furnish moulds better and cheaper than any other make. Please let us know what you may want and receive some interesting prices.

Common Brick Moulds 5 or 6 Brick.....	\$1.75
Iron Lined heads " " " " "	2.10

Write for special discount on
all orders after July 1.

LUMBER AND BRICK DRYERS,
MOST EXTENSIVE IN USE.
W. A. LEARY,

1103 H Street, N. W.

WASHINGTON, D. C.

Do You Want

CREDIT REPORTS on men who make BRICK, on men who buy BRICK, on men who sell BRICK? Trustworthy service at lowest prices; ordinarily \$1.00 for each report.

RELIABLE LIST of BRICK manufacturers and Supply men, in any State, in any Country? These can be furnished at small cost, usually \$1.00 for any single list.

ADVANCE REPORTS that are advance reports of all contemplated construction work calling for BRICK?

TO KNOW how to sell BRICK to the Government? Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS.

ESTABLISHED NINE YEARS.

Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

“LEVIATHAN.”

“Upon Earth There is not His Like.”



MAINTENANCE OF RECORDSSept1896.

MAIN BELTING CO.,
55 and 57 Market St., Chicago, Ill.
GENTLEMEN:—Please ship us via freight, 146
feet x 18" 8 ply "Leviathan" Belting. The rea-
son you have not heard from us of late is, we have
been trying the "just as good for less money"
belting. You can count on our future orders for
"LEVIATHAN." Prompt shipment of the above
will oblige. Yours very truly,

Manufactured under Special Process.

A Guarantee of Superiority.

NOTE.—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

MAIN BELTING COMPANY.

Sole Manufacturers LEVIATHAN BELTING,

55 and 57 Market St., CHICAGO, ILL.

PHILADELPHIA: 1210 Carpenter Street.

BOSTON: 120 Pearl Street.

Elevators

**For handling
CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.**

**Also Furnish
RUBBER,
LEATHER,
COTTON
BELTING.**



Conveyors.

**Manufacture
SHAFTING,
PULLEYS,
HANGERS,
GEARS,
CLUTCHES,
BUCKETS,
BOOTS,
BOLTS,
Etc. . . .**

FIRE BRICK, FIRE CLAY and Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years. Write for prices.

EVENS & HOWARD,
920 Market Street, - - - ST. LOUIS, MO.

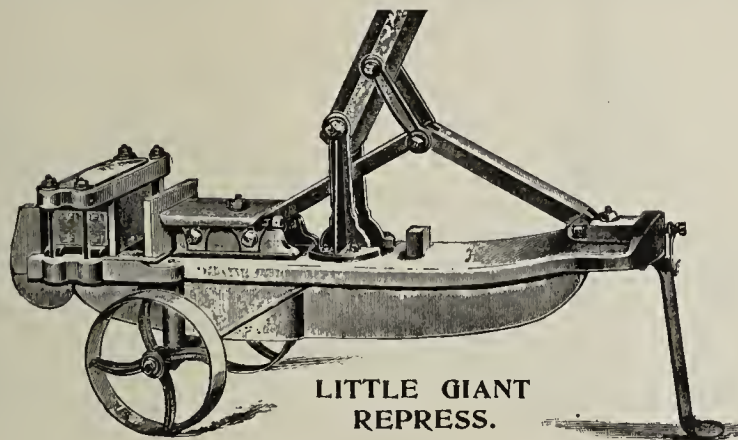
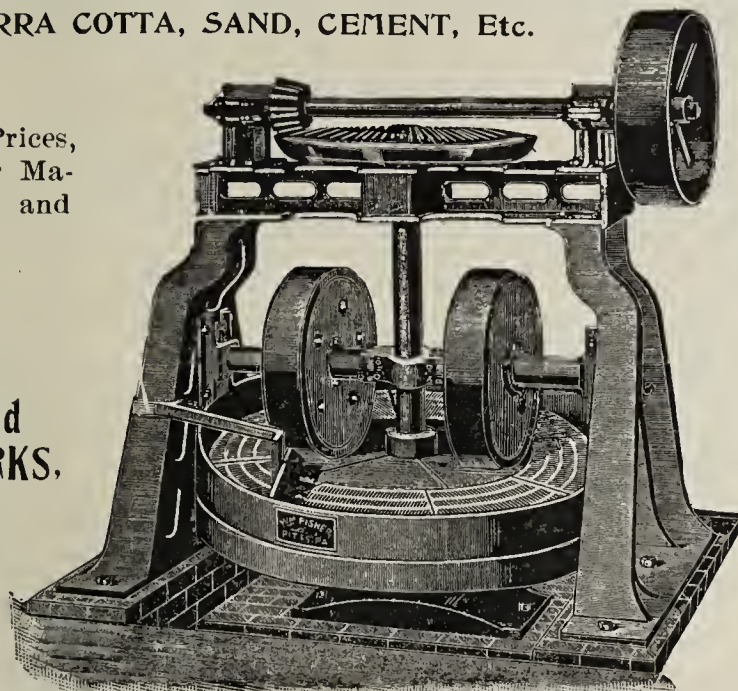
Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

**FISHER ENGINE
FOUNDRY and
MACHINE WORKS.**

Phillips & McLaren,
Proprietors,
24th and Smallman Sts.,
PITTSBURG, PA.



LITTLE GIANT
REPRESS.

ELI Auger Machine,
Capacity 45,000 to
70,000.

ELI Jr. Auger Machine,
Capacity 30,000 to 40,000.

LITTLE ELI Auger Machine,
Capacity 15,000 to 20,000.

No. 1 A, Auger Machine,
Capacity 25,000 to 35,000.

No. 2 B, Auger Machine,
Capacity 12,000 to 20,000.

THE No. 1 A and No. 2 B Machines furnished with Square Hopper in place of Upright Pug Mill if desired.

DISINTEGRATORS, HORIZONTAL CONVEYORS,

GRANULATORS—SINGLE AND DOUBLE SHAFT,

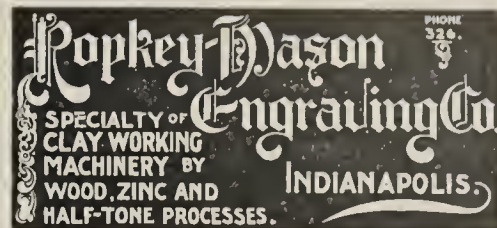
UP-RIGHT PUG-MILLS, WINDING DRUMS,

BRICK TILE AND HOLLOW BLOCK TABLES.

TRUCKS, WHEELBARROWS, ETC.

Manufactured and fully warranted by

Michigan Brick and Tile Machine Co.,
MORENCI, MICH.



DAVIS'S Brick, Tiles and Terra-Cotta. Third Edition. Revised, Improved and Enlarged....

RECENTLY PUBLISHED.

A Practical Treatise ON THE Manufacture of..... **Brick, Tiles and Terra-Cotta**

Including Stiff Clay, Dry Clay, Hand Made, Pressed or Front, and Roadway Paving Brick, Enamelled Brick, with Glazes and Colors, Fire Brick and Blocks, Silica Brick, Carbon Brick, Glass Pots, Retorts, Architectural Terra-Cotta, Sewer Pipe, Drain Tile, Glazed and Unglazed Roofing Tile, Art Tile, Mosaics and Imitation of Intarsia or Inlaid Surfaces. Comprising every product of Clay employed in Architecture, Engineering and the Blast Furnace. With a Detailed Description of the Different Clays employed, the Most Modern Machinery, Tools, and Kilns used, and the Processes for Handling, Disintegrating, Tempering and Moulding the Clay into Shape, Drying, Setting and Burning. By Charles Thomas Davis. Third Edition. Revised and in great part rewritten. Illustrated by 261 engravings, 662 pages, 8vo Price, \$5.00. This volume will be sent by mail to any address in the world, or delivered by express C. O. D., freight paid, to any address in the United States for \$5.00.

A circular of eight pages, with specimens of the illustrations, showing the full Table of Contents, will be sent free to any one furnishing his address.

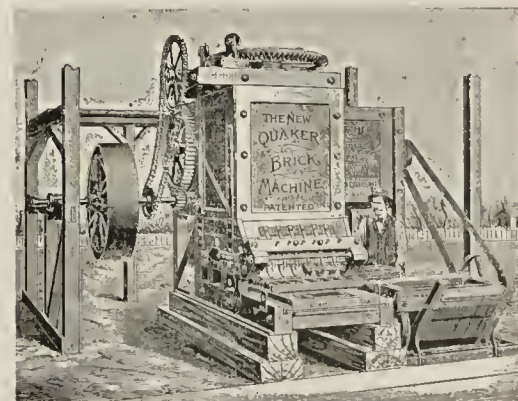
HENRY CAREY BAIRD & CO.

Industrial Publishers, Booksellers and Importers,
810 Walnut St. PHILADELPHIA, PA., U. S. A.

Soft Mud Brick Machinery

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sand-



ing Machine, capacity 40,000 or more per day. We carry in stock a full line of first-class brickyard supplies at a very reasonable price.

Send for Catalogue.

James W. Hensley,

General Agent,
Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

FAST TIME AND THROUGH SERVICE TO SOUTH BEND.

Commencing June 22, through parlor cars will be operated between Indianapolis and South Bend daily, except Sunday, on Big Four train No. 3, leaving Indianapolis at 5 p. m., making immediate connection with Vandalia line fast train at Colfax, which passes through Frankfort, Logansport, Lake Maxinkuckee and Plymouth, arriving at South Bend at 10:45 p. m. G. E. ROCKWELL, D. P. A., for details.

COLORIFIC.

For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of

WESTBROOK & WELLS,
Ogdensburg, N. Y.

A. F. TENNILLE'S

Bureau of

News and Legislative Information,

Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.

Lake Erie & Western R. R.

...ALL RAIL...

Niagara Falls EXCURSION.

Wait for the Old Reliable
Lake Erie & Western

PERSONALLY CONDUCTED

NIAGARA FALLS EXCURSION
Thursday, August 5, 1897,

...ALSO...

Sandusky. Put-in-Bay, Cleveland
and Buffalo, with side trips to

LEWISTON, TORONTO, THOUSAND IS-
LANDS, Etc.

For tickets, rate, time and pamphlet containing general information, call on any ticket agent of the above route, or address

C. F. DALY, Gen. Pass. Agt.,
Indianapolis, Ind.



GEORGE A. MOSHER,
President.

JAMES A. BUCK,
Vice-Prest. and Gen. Man.

LE ROY VERMILYEA,
Secretary and Treasurer.

The Buck Machine Company,

SOLE MANUFACTURERS OF

Champion Brick Mold Sanding Machines, COHOES, N. Y.

The above Company was duly incorporated on the 8th day of March, 1897, under the laws of the State of New York, with a capital of \$60,000, which has been fully paid in.

This company has acquired by purchase all the interests of J. A. Buck and others in the business of manufacturing Champion Brick Mold Sanding Machines heretofore conducted by him, together with all patents covering said machines.

Of these patents, No. 301,087 is the foundation patent on the feed-rack applied to a cylinder machine. Buck's title to this patent was fully sustained by the decision of the United States Circuit Court of Appeals filed December 8, 1896, which decision was affirmed January 25, 1897, and a motion for a rehearing of the case denied. From this decision there is no appeal, and the title to this patent cannot be disturbed.

Patent No. 499,206 was sustained by Judge Coxe of the United States Circuit Court in a decision filed February 6, 1897, wherein he also sustained Buck's title to said patent. This patent covers the yielding form of feed rack as used in the later Champion Sanders. On February 15, 1897, a decree of the Court was entered granting and injunction against the use of infringing machines.

A copy of these decisions will be sent by mail upon request.

Claims against users of infringing machines will be actively prosecuted.

This Company is now prepared to promptly furnish the latest and most approved style of Champion brick mold sanding machines.

These machines are guaranteed in every respect, and purchasers will be fully protected in their use.

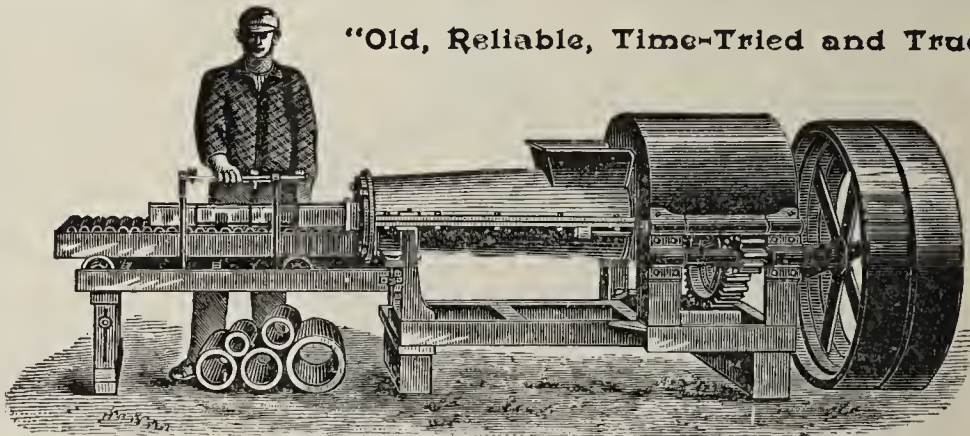
No agents should be recognized except those presenting credentials from this Company.

All communications, orders and payments should be made direct to

THE BUCK MACHINE COMPANY, Cohoes, N. Y.

KELLS & SON'S IMPROVED BRICK AND ... TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON, FARMHILL, ONTARIO,

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the NEW QUAKER BRICK MACHINE.

G. COLDEWE & CO.,

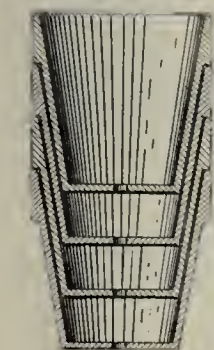
MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and... MACHINE MOULDS

We manufacture the the most substantial Moulds known, and guarantee every flould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Make Money WITH THE ONLY SUCCESSFUL Flower Pot Machine (PATENTED.)

No expert workmen required.
Capacity in 10 hours:
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "
Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

INDIANAPOLIS, IND.



CHAMPION Brick Mould SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and Serviceable.

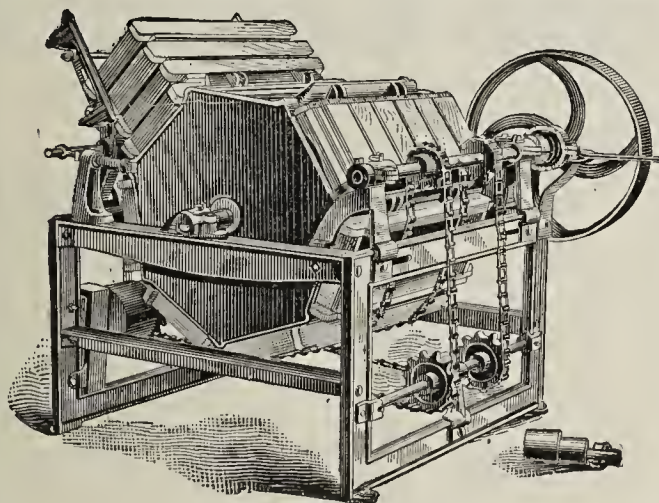
A. H. NEWTON,

Manager and Sole Agent, HAVERSTRAW, N. Y.

THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, and a suit for that purpose has been commenced against Buck and is now pending in the United States Circuit Court for the Northern District of New York.

Only one patent No. 301,087 was involved in that decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit has been commenced on these patents against Buck, and any persons purchasing from him or his agents will be prosecuted for infringing.



4000 TO 5500

(Gallons of Water per hour.)

BY HAND-POWER.

Pumps, Hand-power Pumps.

(LOUD'S PATENT.)

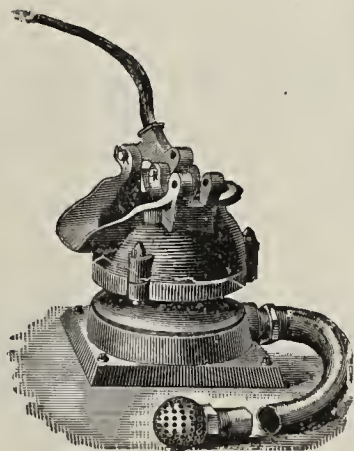
These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries or wherever it is desired to raise a large quantity of water by Hand-power. The pump has large valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



VANDUZEN STEAM PUMP
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
Always in Order, never Clogs nor freezes. Every Pump Guaranteed.
10 SIZES.
200 to 12000 Gallons per Hour.
Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, O.

GEO. S. COX'S

Ready Made Cutting Wires,

Always give Satisfaction.

EAST LIVERPOOL, OHIO.

Send for Samples and Prices.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN,
H. W. FULLER, Ass't Gen'l Pass. Agent.
Gen'l Pass. Agent, CINCINNATI, OHIO
WASHINGTON, D. C.

M. V. B. WAGONER'S

SLIP CLAY { For Glazing of Pottery } WORKS

ESTABLISHED 1845.

Clay in stock in any quantity, in barrels and bulk by the carload.

Office, 20 Ten Broeck St., ALBANY, N. Y.

STOP-LOOK LISTEN

THE POPULAR



IS THE BEST LINE TO

CHICAGO

TIME REDUCED TO 4 3/4 HOURS.

FOUR DAILY TRAINS

Leave Indianapolis	{ 7:00 a. m., 11:50 a. m. 3:35 p. m., 12:55 night
Arrive Chicago	{ 12:00 noon, 6:00 p. m. 8:20 p. m., 7:20 a. m.
Trains	{ 3:30 a. m., 7:45 a. m.
Arrive Indianapolis	{ 2:35 p. m., 4:37 p. m.

LATEST IMPROVED

VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant

PARLOR CARS AND DINERS

Local Sleeper in Indianapolis Ready at 8:30 p. m.
Leave Chicago, Returning, at 2:45 a. m.

Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: 2 West Washington St., Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.

VANDALIA LINE

The Short Line for

ST. LOUIS AND THE WEST.

LEAVE INDIANAPOLIS,	AR. TERRE HAUTE	AR. ST. LOUIS.
* 7:20 am	10:05 am	.....
* 8:10 am	10:15 am	3:15 pm
* 12:40 noon	2:35 pm	7:12 pm
* 7:00 pm	9:04 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am
*Daily.		

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46 Jackson Place and Union Station.

W. W. RICHARDSON, Dis. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS

MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns WANTING INDUSTRIES

This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

TAKE THE
BIG 4
TO
ST. LOUIS

BRICK CARS and TRUCKS

Of Any and All Kinds.
Easy Running. Light yet Strong.

Don't fail to get our prices. Catalogue free.

THE ATLAS BOLT & SCREW CO.,
Cleveland, Ohio.

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,

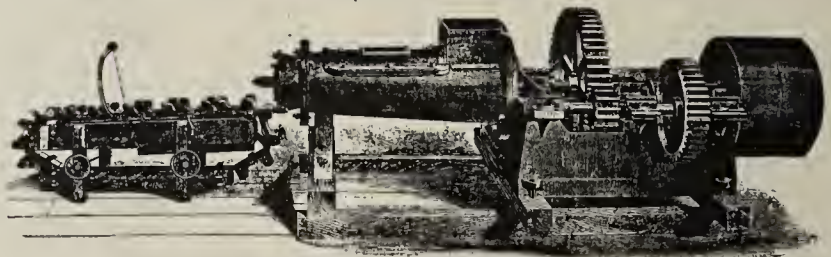
—Wellsburg, W. Va.

Fourteen (14) sold already this Season.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers
... of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequalled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

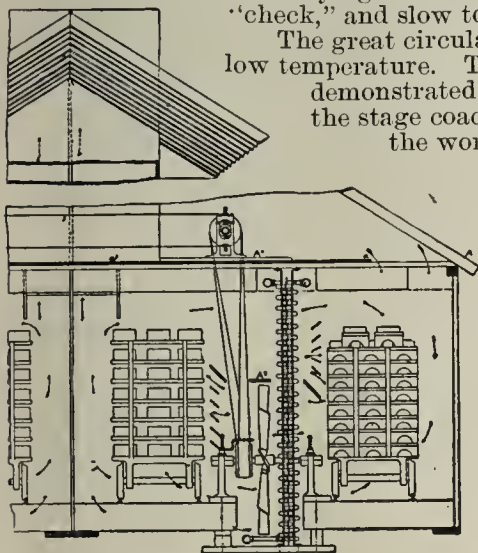
Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Mention the CLAY-WORKER,
When writing to Advertisers
Mention the CLAY-WORKER.

Still Further Testimony!

Soft Mud Brick Dried in 10 or 12 hours.



The INSIDE FAN DRYER.

U. S. Pat. Mar. 31, 1891. No. 449,170.
U. S. Pat. Mar. 31, 1891. No. 449,231.
British Pat. Mar. 31, 1891. No. 5,520.
Canadian Pat. May 30, 1892. No. 39,025.
Canadian Pat. May 30, 1892. No. 39,026.

You have the best drier in the market and I purpose in the near future to put in another two track section. Wishing you success, I am

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.
DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,

CHAMBERS BROTHERS CO.

J. H. CHAMBERS, Gen'l Mgr.

Most trying service with large brick of tough clay that is liable to "check," and slow to dry.

The great circulation of air does it, as of out of door drying, at low temperature. The correct principle, successfully adapted and demonstrated. Saves more time than the locomotive over the stage coach; with fans and machinery, inside and close to the work, that pay well and cost no trouble to run, as users attest.

The fans save in cars, pipe and enclosure to make the first cost less than half that of other dryers, and in continuous use for less than one-fourth of the fuel in using engine exhaust steam only for heating—much more of it and without back pressure.

306 Hannah St., West, Hamilton, Ont. Can. }
July 10th, 1897. }

S. G. Phillips, Esq., Rahway, N. J.

Dear Sir:—I am pleased to reply to your letter 12 feet x 54 feet, two track, drier has been in use by me since May 15th, 1897 and works remarkably well.

Our clay takes from six to eight days to dry on yard pallets and three or four days in a neighboring drier, yet the six or seven thousand large soft mud brick it holds on 16 cars are easily dried in 10 or 12 hours in a superior and most economical manner because of heating with the engine exhaust steam only.

The endless belts drive the 10x60-in. diameter (inside volume) fans easily not appearing to cost over 6 or 7 h. p. at 360 turns per minute to fairly make the wind blow.

I purpose in the near future to put in another two track section.

Yours truly,

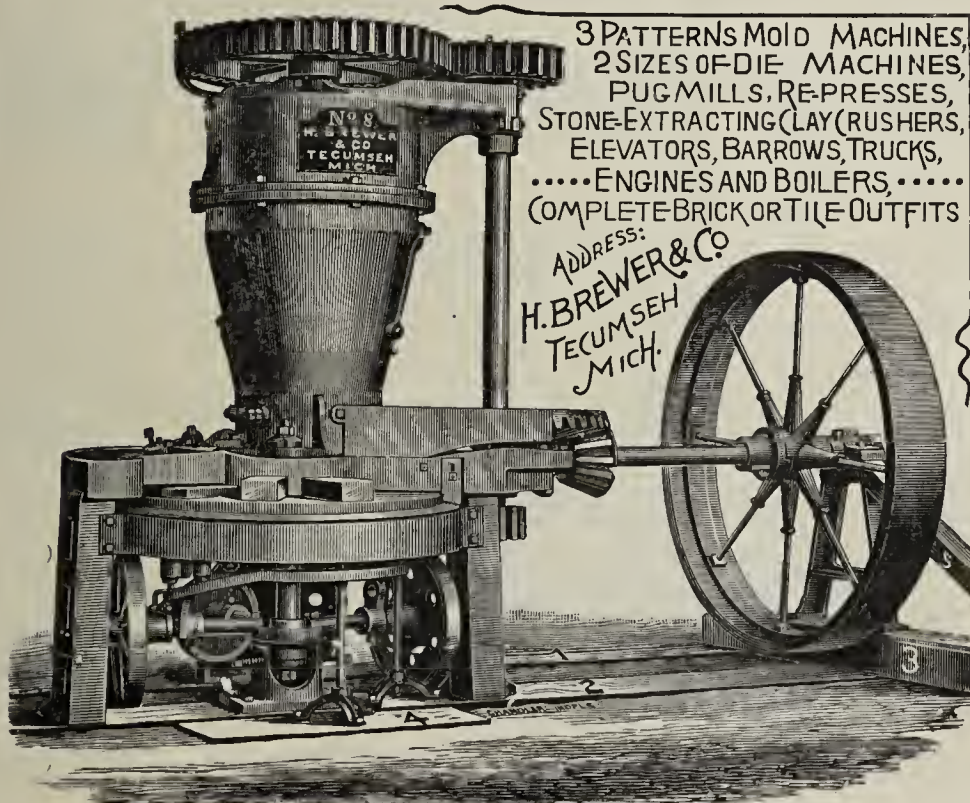
JOHN W. FRID.

S. G. PHILLIPS.

Agent and
Patentee,

161 Grand Street.

Rahway, N. J.



3 PATTERNS MOLD MACHINES,
2 SIZES OF DIE MACHINES,
PUG MILLS, RE-PRESSES,
STONE-EXTRACTING (LAY) CRUSHERS,
ELEVATORS, BARROWS, TRUCKS,
..... ENGINES AND BOILERS,
COMPLETE BRICK OR TILE OUTFITS

ADDRESS:
H. BREWER & CO
TECUMSEH
MICH.

ARCHITECTURE

Architectural & Mechanical Drawing; Marine, Stationary and Locomotive Engineering; Sheet Metal Pattern Cutting; Plumbing; Electricity; Railroad, Municipal, & Bridge Engineering; Surveying and Mapping; Book-Keeping; Shorthand; English Branches; Mining; Metal Prospecting; Machine Design. All who study

GUARANTEED SUCCESS.

Fees Moderate, Advance or Installments.

Circular Free; State subject you wish to study.

International Correspondence Schools, Box 958, Scranton, Pa.



Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD, JACKSONVILLE and HANNIBAL, MO.

Through Sleeping Cars to St. Louis, Mo., via I. D. & W. Clover Leaf Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express.....	8.15 a m
Accommodation.....	3.45 p m
Fast Express.....	11.10 p m

ARRIVE.

Fast Express.....	3.35 a m
Accommodation.....	10.40 a m
Mail and Express.....	4.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



INDIANAPOLIS AND CINCINNATI LINE

6 Trains Daily. Parlor Cars and Cafe Dining Cars on day trains; Pullman, Compartment and Standard Sleeping Cars, and Chair Cars, also Wagner Sleeping and Chair Cars on night trains. Direct Connection made at CINCINNATI without Omnibus and Transfer, for all points

SOUTH and EAST

INDIANAPOLIS, TOLEDO AND DETROIT

The Michigan Line (via Hamilton.)

5 Trains daily to Dayton.

2 Trains daily to Toledo.

2 Trains daily to Detroit.

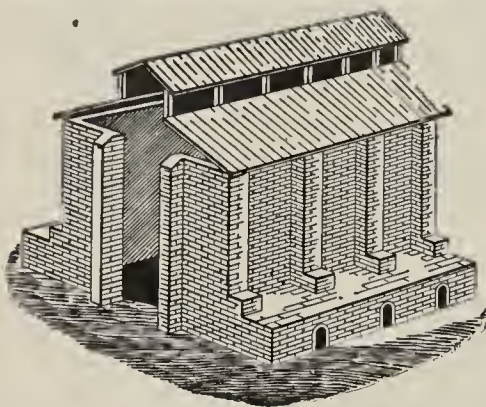
Observation, Vestibuled Coaches and Parlor Cars on Through Express Trains. Pullman and Wagner Sleeping Cars on night trains.

G. W. Hayler, D. P. A. } Indianapolis,
W. J. Nichols, T. P. A. } Ind.

D. G. EDWARDS,
Passenger Traffic Manager.



Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS,
Mention the CLAY-WORKER.



Up-Draft Kiln.

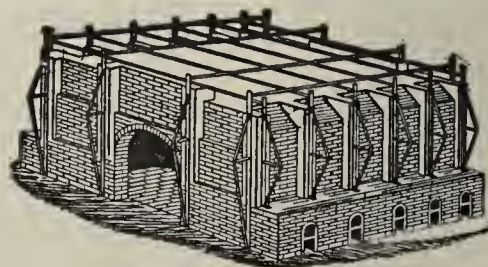
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiln.

ALSIP'S

LATEST IMPROVED DOWN and UP-DRAFT KILN.

IS SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

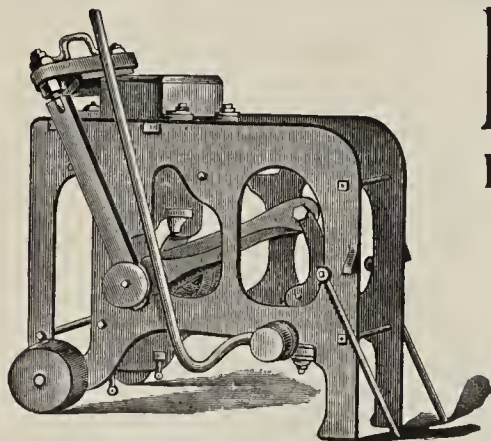
If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

Address, **S. H. ALSIP,**

Days Brick Yard.

BELLEVILLE, ILL.



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

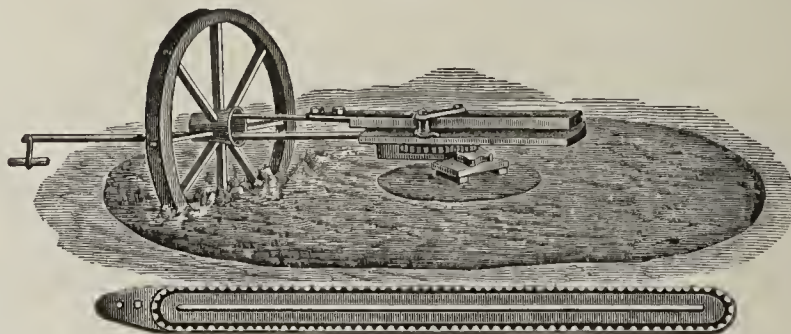
Send for Circular and Price-List.

PHILADELPHIA BRICK MACHINE WORKS

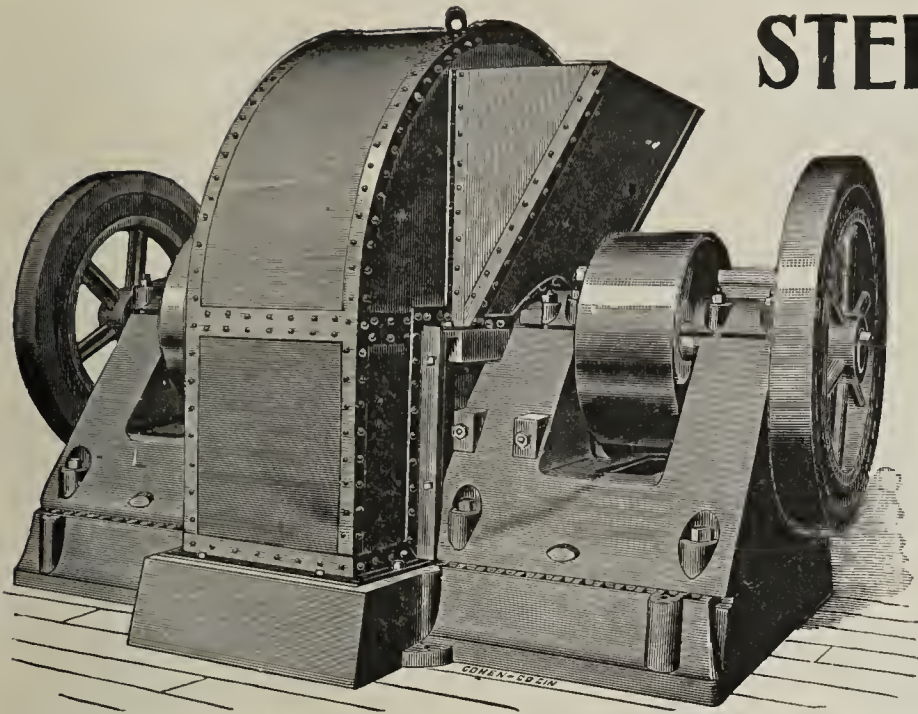
Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,
Aurora, Ind.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,
Grassy Point, Rockland Co., N. Y.

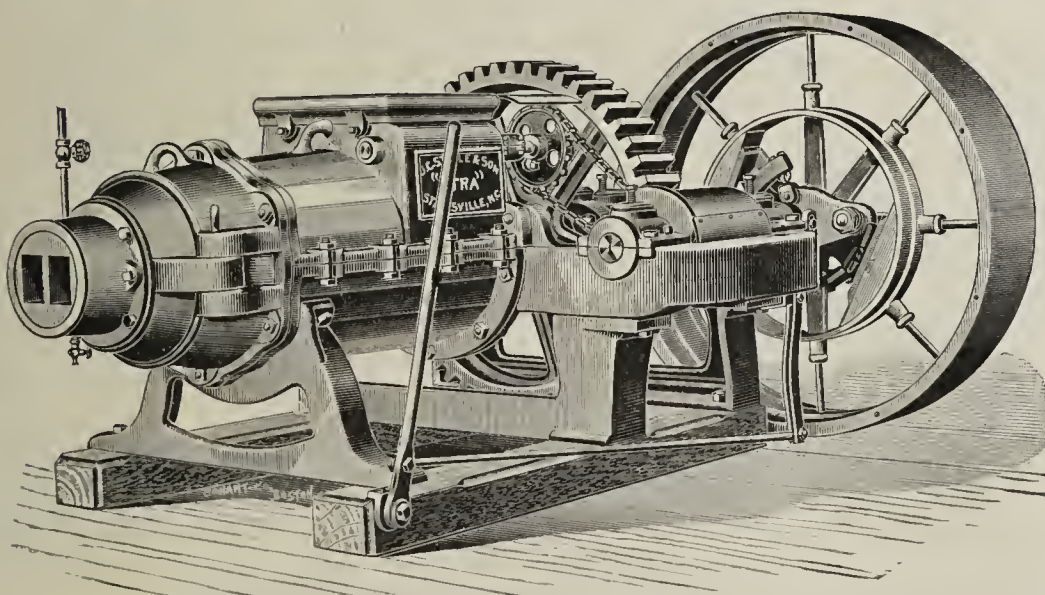
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.
[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

The New South Brick Machinery



X-tra Machine. Capacity 25,000.

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers, Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.

TACCIA, VA., June 30, 1896.
J. C. STEELE & SON, Statesville, N. C.
In answer to your enquiry will say we are using one of your latest Brick Machines shipped us about two months ago, and that it gives us pleasure to recommend it to any one wishing a good Brick Machine and one that will do all that is claimed for it. We have had it thorough tested and it turns out work perfectly satisfactory. The contractor who is building the cotton factory here says its work is of an unusually high order.

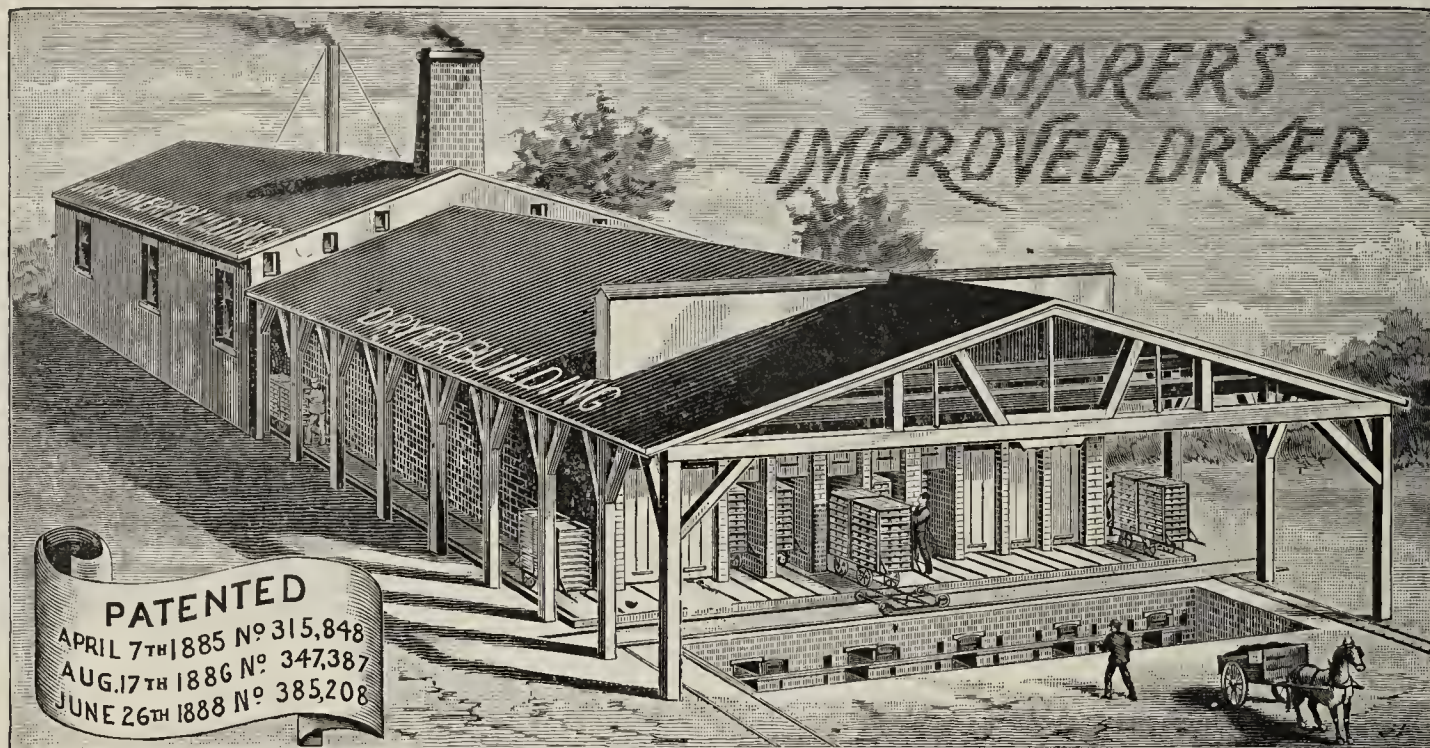
Yours respectfully,
T. A. CAPPS & CO.

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

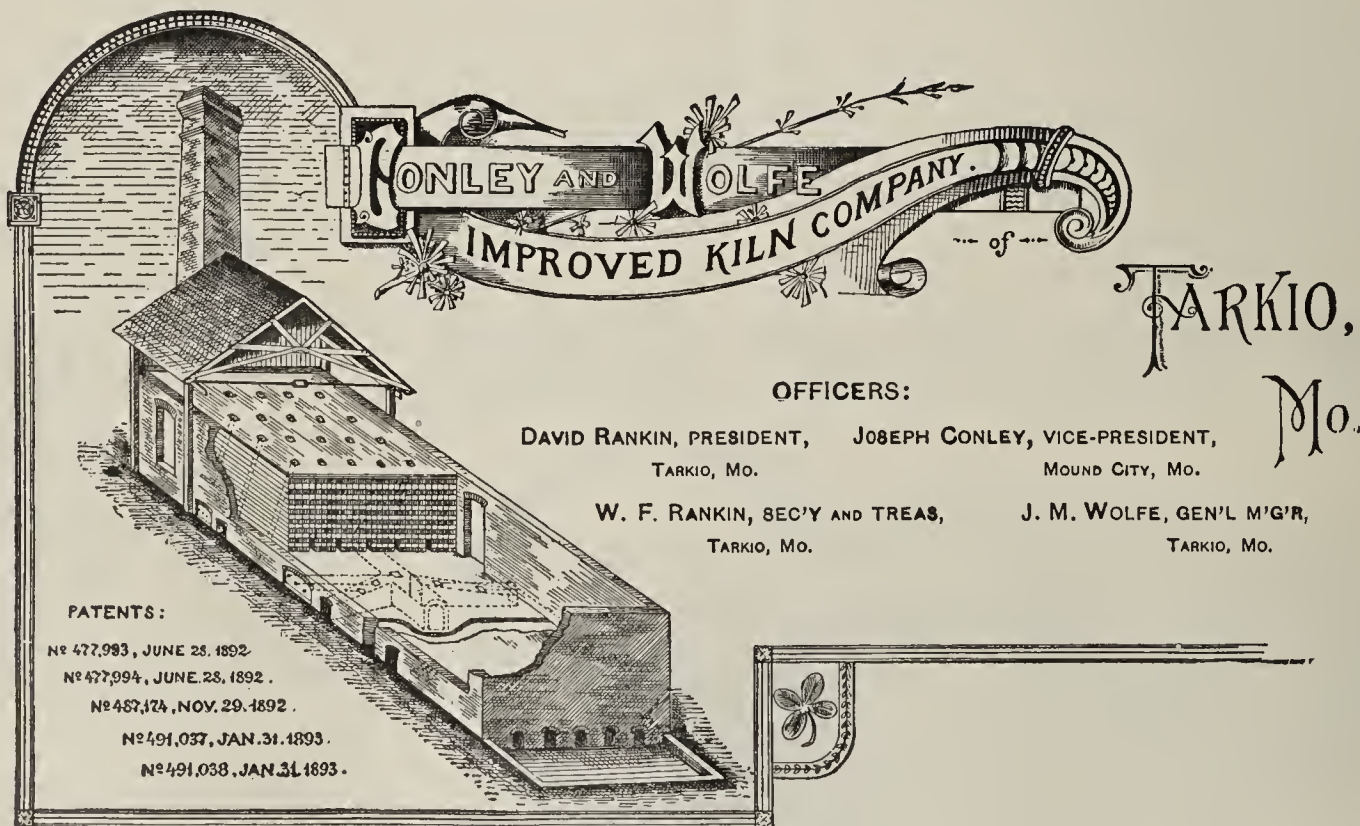
Geo. W. Sharer,

Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.



COMPLETE Dryer and Kiln outfits, and Complete Plants a specialty. Address

GEO. W. SHARER, 2224 Tioga, St. Philadelphia, Pa.



THIS KILN is cheap to construct, simple in operation and permanent in character. It has no crown to fall in and costs nothing for repairs. The dampers in the bottom give complete control of the heat and draft. It burns all brick evenly and thoroughly. It heats the brick gradually and cools the same, producing a tough and thoroughly annealed brick. It requires less than 200 lbs. slack coal per thousand to burn the very best annealed vitrified shale paving brick. It saves labor—one man can fire the largest kiln.

The Slack is converted into Gas and all the Heat Energy in the Coal is Utilized.

IT IS A SMOKE CONSUMER
AND A PROFIT PRODUCER.

✧ **YOU NEED THIS KILN.** ✧

WRITE OUR GENERAL MANAGER
FOR FULL INFORMATION.

Morrison's Latest Improved Kiln, **FOR BURNING BUILDING BRICK.**

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

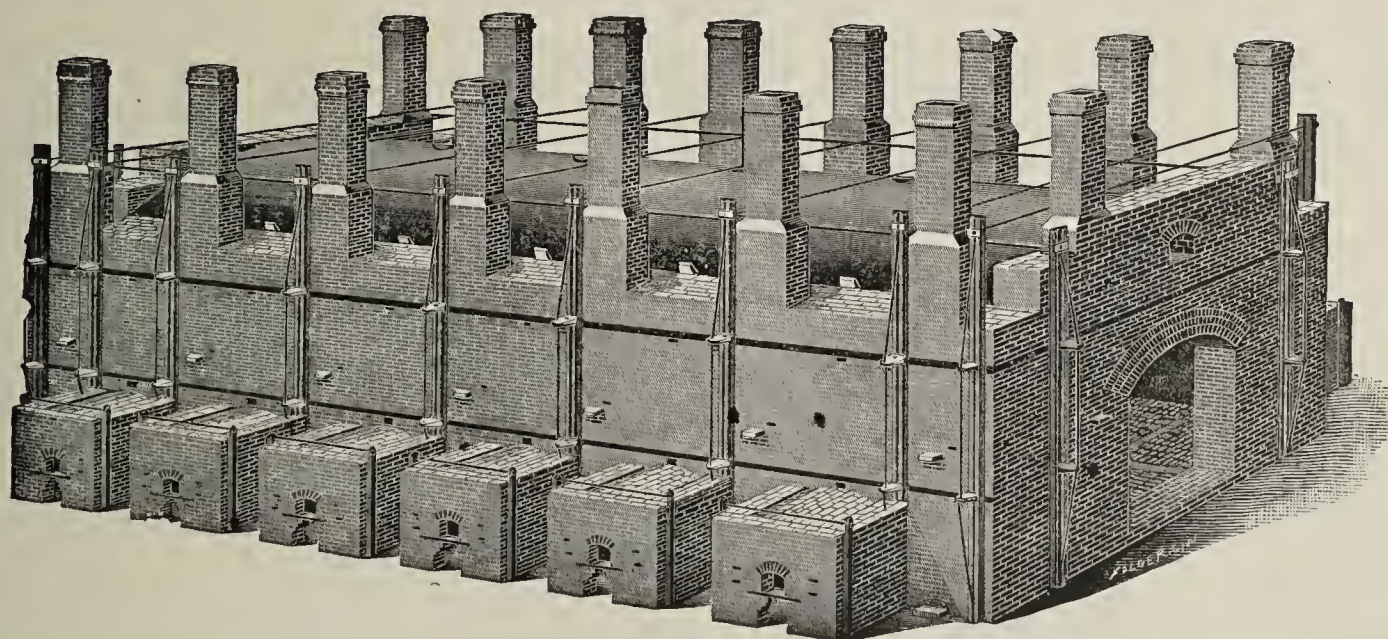
Write us for descriptive pamphlet, prices, etc., address

R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY IMPROVED — DOWN-DRAFT KILN and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially **front, ornamental and paving brick**. These Kilns have gained a reputation for burning **all hard and uniform brick**. These Kilns are easily controlled and in every way practicable and desirable.

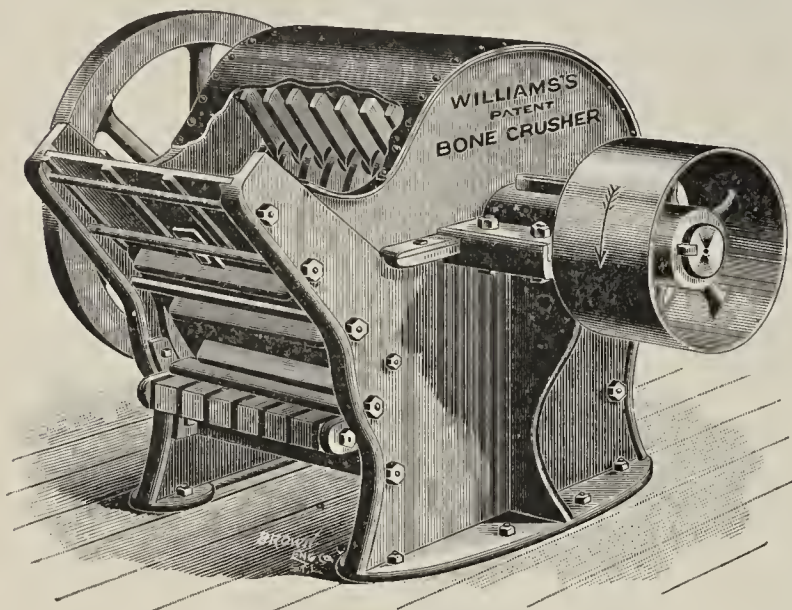
We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of **under-ground connecting tunnel flues**. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

Our Pulverizer is fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.



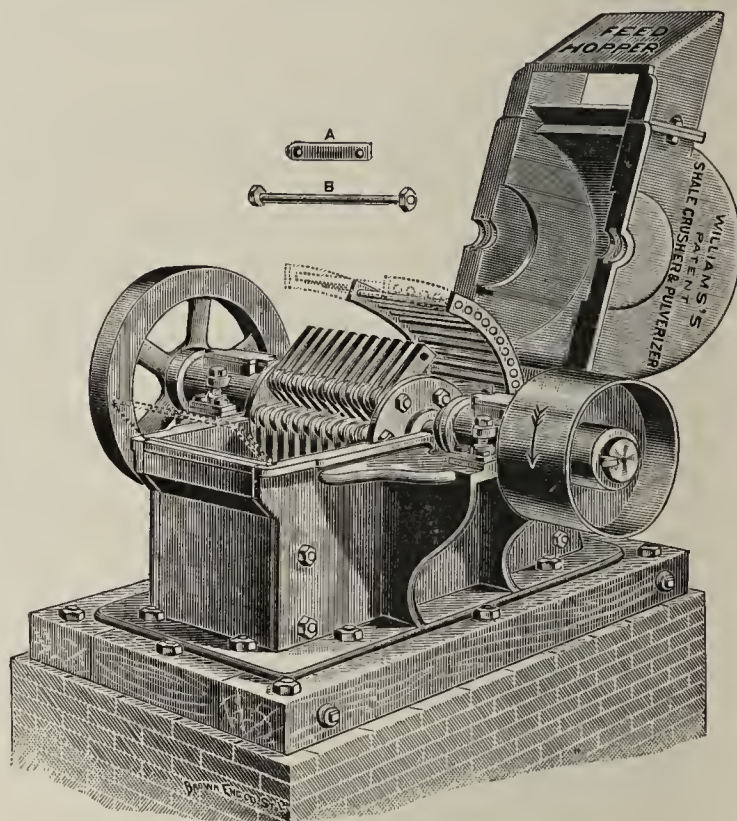
Williams's Shale Breaker.

THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

The Williams Patent Crusher and Pulverizer Co.

2705 North Broadway, - - St. Louis, Mo.



Williams's Shale and Clay Pulverizer.
With Clay Steamer Attached.

To all Whom it May Concern.

The AMERICAN CLAY-WORKING MACHINERY CO.,

Replies to the Chambers Brothers Company's Circular in Reference to Decision in Patent Suit for Infringement against J. W. Penfield & Son.

PLEASE READ CAREFULLY:

THE AMERICAN CLAY-WORKING MACHINERY COMPANY, of Bucyrus and Willoughby, Ohio, takes pleasure in informing the trade that all of their modern, best and most important brick machines are entirely unaffected by the decision in the case of Chambers Bros. Co. vs. J. W. Penfield & Son. The circular of the Chambers Brothers Company calling attention to this decision in the case is likely to deceive the unwary. Attempt was made by Chambers to have his endless belt cut-off patents Nos. 297,671 and 297,917, broadly construed to cover all revolving cut-offs. This the Court refused to do, and held that the Penfield Machine did not infringe those claims of the two earlier patents. One machine formerly made by J. W. Penfield & Son was held infringed upon patent No. 362,204, but this is an old style machine. None of that class has been built for the last three years. The American Clay-Working Machinery Co. manufactures and sells to the public Cutting Off Machines under the authority and protection of the O. W. Johnston patent No. 478,346, and the John Thompson patent, No. 496,286, which have not been attacked in the Courts by anybody. It is conceded by Chambers Bros. Co. that our primary wheel cut-off machine, manufactured under Patent No. 391,698, sometimes called the French cut-off, ante dates their patent. This machine we manufacture and are now offering to the trade. In addition to the cut off, manufactured under the Johnson patent, No. 478,436 and the Thompson patent, No. 496,286 and Frey patent No. 391,698, we manufacture the Automatic Side Cut-off, the Semi-Automatic Cut-off, the Hand Cut-off, the Combination Cut-off, the Galesburg End-cut Machine and the Frey Wheel End Cut-off Machines. Also machines so arranged as to work satisfactorily, either for end-cut or side-cut brick—none of which are claimed to infringe the Chambers patents. It is not disputed by any one that the American Clay-Working Machinery Co. owns and controls the fundamental patents on this side-cut-off class of machines. Their superiority over the end-cut machines of the Chambers class is too well known and recognized by brick manufacturers to need further comment. Our legal counsel, Messrs. Wood & Boyd, of Cincinnati, Ohio, advise us that our present machines are not infringing any of the claims involved in the Chambers suit. We believe their advice to be sound—therefore we guarantee all parties purchasing and using brick and tile cut-off machines made by us, to hold them harmless from all loss, costs or damages by reason of any alleged infringement of said Chambers patents.

The AMERICAN CLAY-WORKING MACHINERY CO., Bucyrus, Ohio.

It's Beginning to Move!



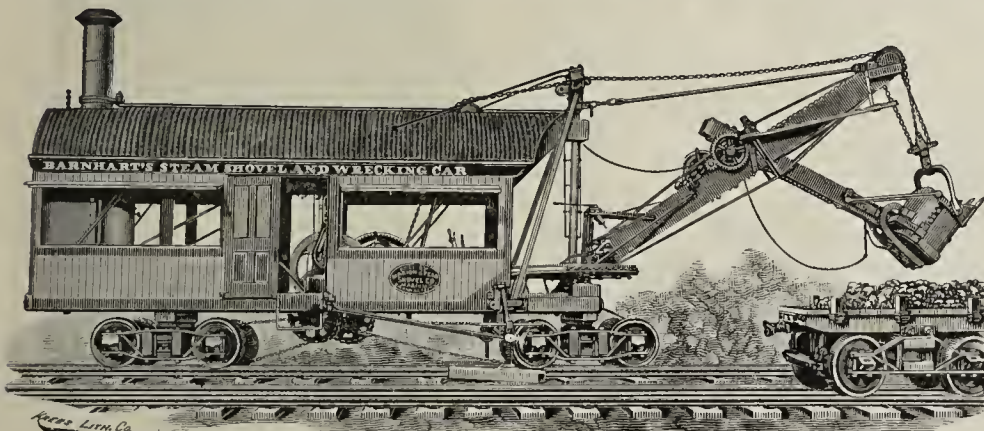
It will move slowly at first, but it has really started. Pretty soon it will roll easily and merrily along. But at present you must **help it along** all you can. If he had a lever it would move faster. Wouldn't it?

Remember, we have every appliance that will prove **a lever in your hand** to make business move along. And we are still selling them at hard times prices. Is your yard in shape to take care of rush

orders when they come? They are surely coming this time.

Chicago Brick Machinery Co. 225 Dearborn St.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.



STYLE C—¾ YD.

Do You Want

A BRICK MACHINE

..... A DRY PAN

..... A PUG MILL?

IF SO DON'T FAIL TO

Get
Our
Prices,



They
Can't
... be
Beat.

.....

WOOLLEY'S MACHINERY is built on mechanical lines and of the best material. Our "**Iron King**" is a non-breakable brick machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ability of every part.

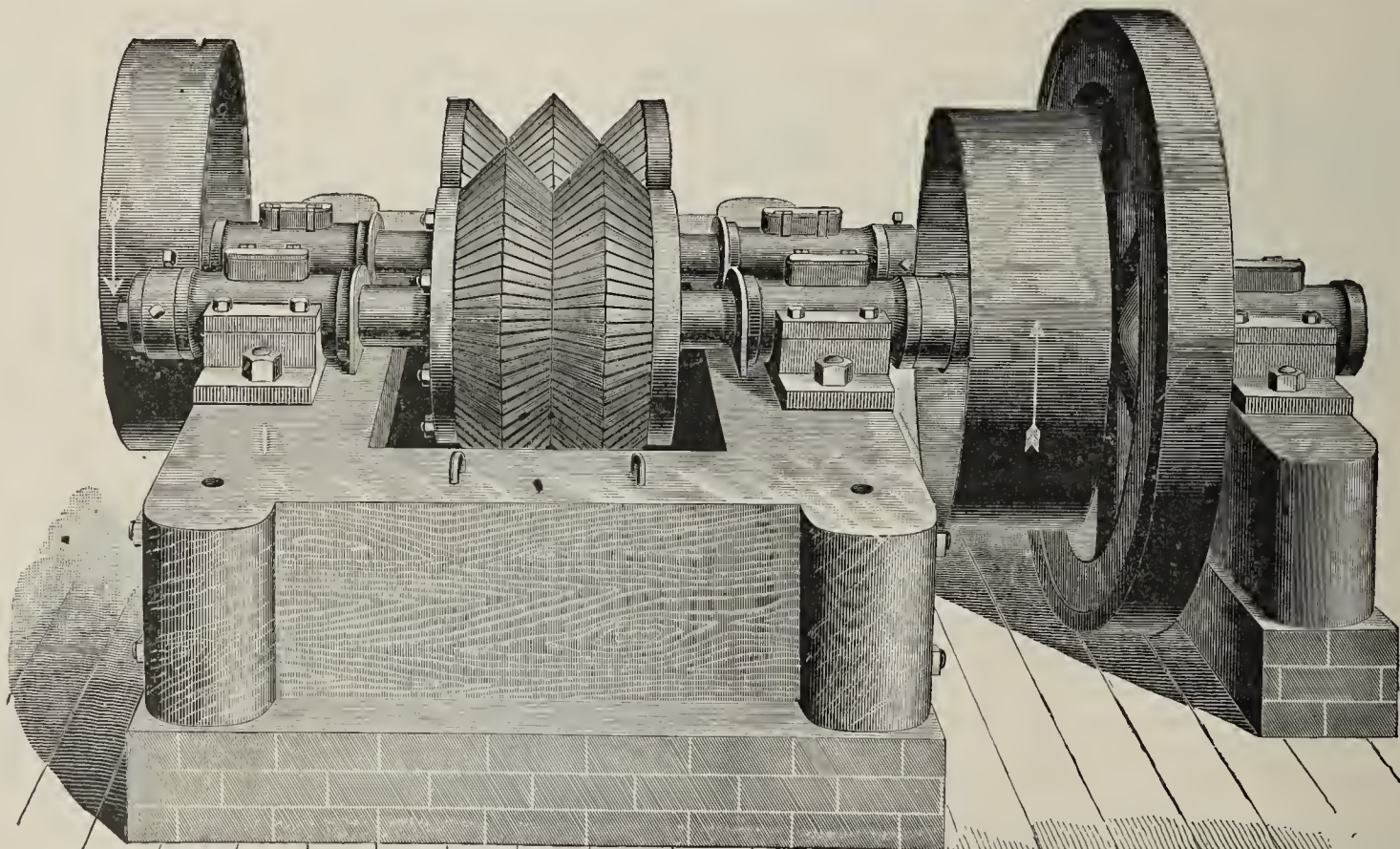
We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

It will afford us pleasure to correspond with you.

Mention the Clay-Worker

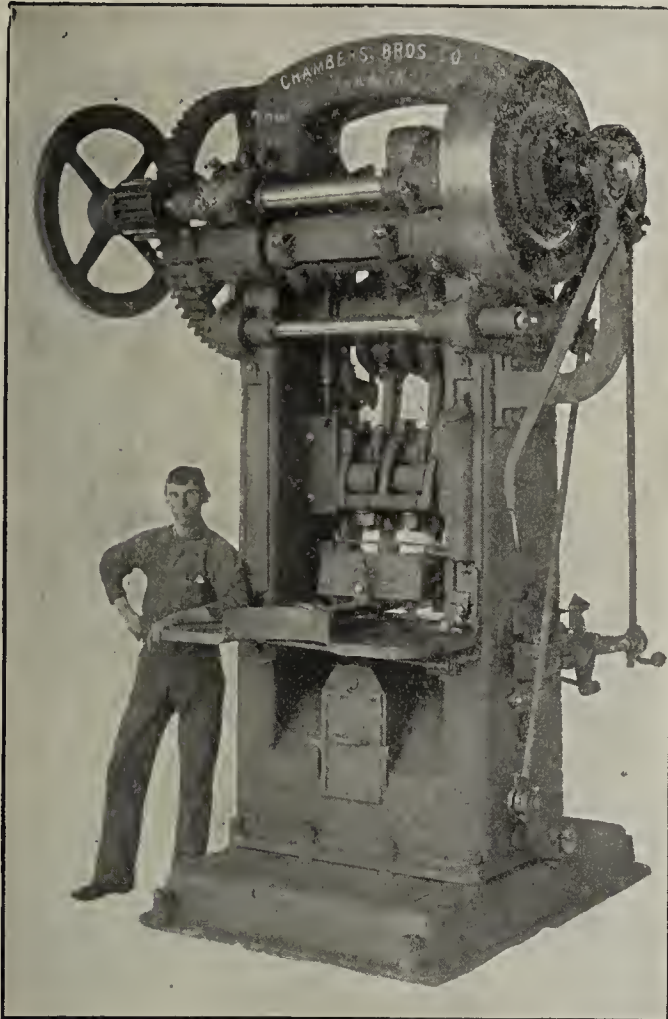
NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building
26 Cortland and 21 Dey Streets, New York, U. S. A.

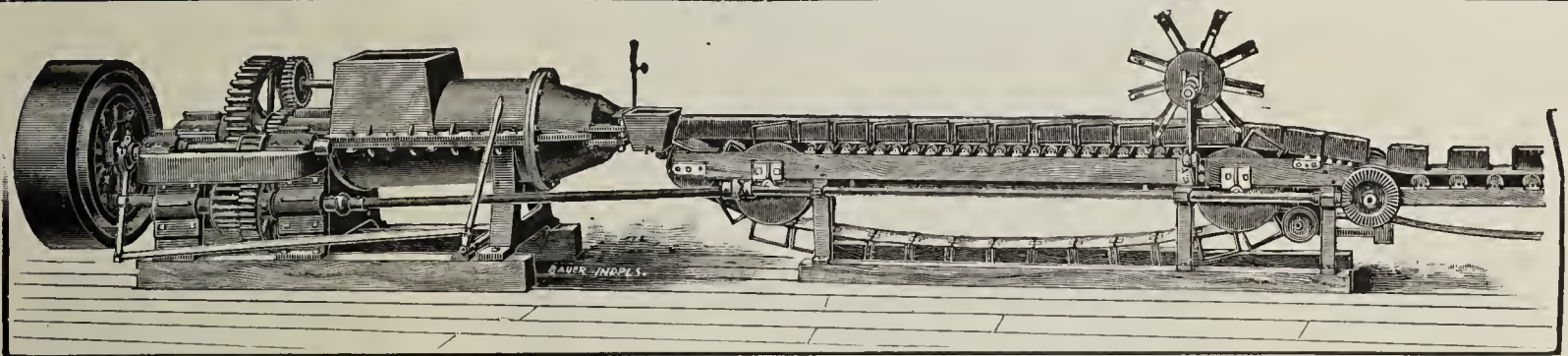


The Chambers Power Repress

...For Plastic Brick...

A STRONG, stiff, machine, with all the pressing machinery above the mould-box and away from the dirt. Steel-faced cams and hardened steel cam-rollers. Main shaft bearings made with long sleeves. Cross-head guides fitted with adjustable bronze gibs. The finished brick is delivered upon a plate, and is never touched by the incoming clot, which is placed in exact position and cannot be shaved. During the initial pressure any surplus clay in the clot is expelled, and all brick thus gauged to uniform thickness, following which all openings are closed and the finishing pressure applied in a practically tight box. The product is repressed, tempered clay brick, free from blemish arising from method of delivery, and of practically uniform density and thickness. The pressure applied to each brick can be regulated at will. Weight about 14,000 pounds.

Manufactured by **Chambers Bros.' Co.**
Fifty-Second St. Philadelphia, Pa.
Below
Lancaster Avenue. U. S. A.



DANVILLE, ILLS, August 12th, 1897.

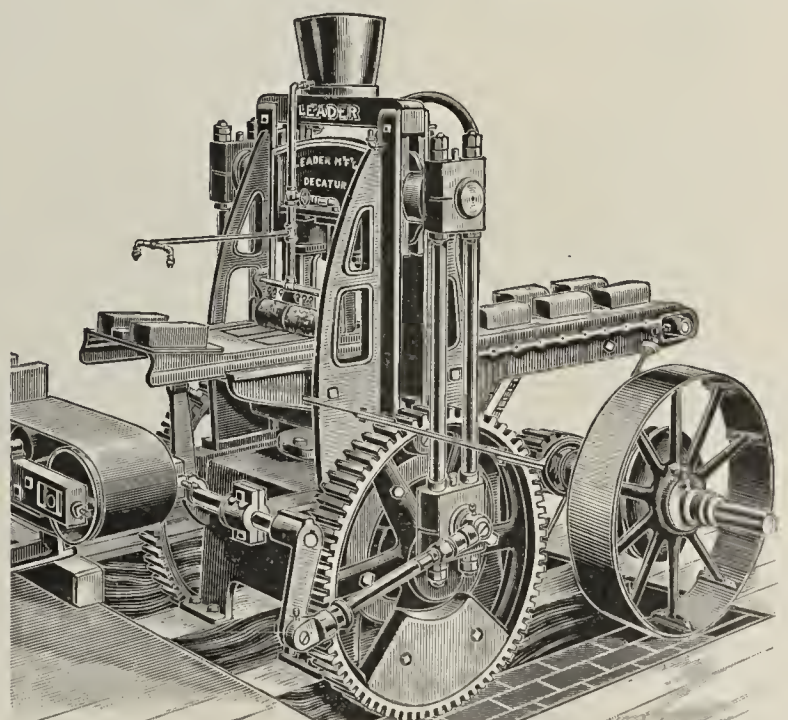
LEADER MFG. Co., Decatur, Ill.

Gentlemen:—We have been using two of your double power represses for nearly two years. Although the presses are in constant use (as we repress all of our product), we have had no trouble with them; both the quantity and quality of the work is entirely satisfactory. About three years ago we began with and used another make until we saw yours at work, when we substituted yours for the old ones, and we find we made a good investment. For strength, durability and simplicity we think THE LEADER RE-PRESS has no equal.

Yours truly, DANVILLE BRICK AND TILE Co.,
J. G. SHEA, President.

We have pleased several and can please you. Complete line of new, and bargains in second-hand machinery.

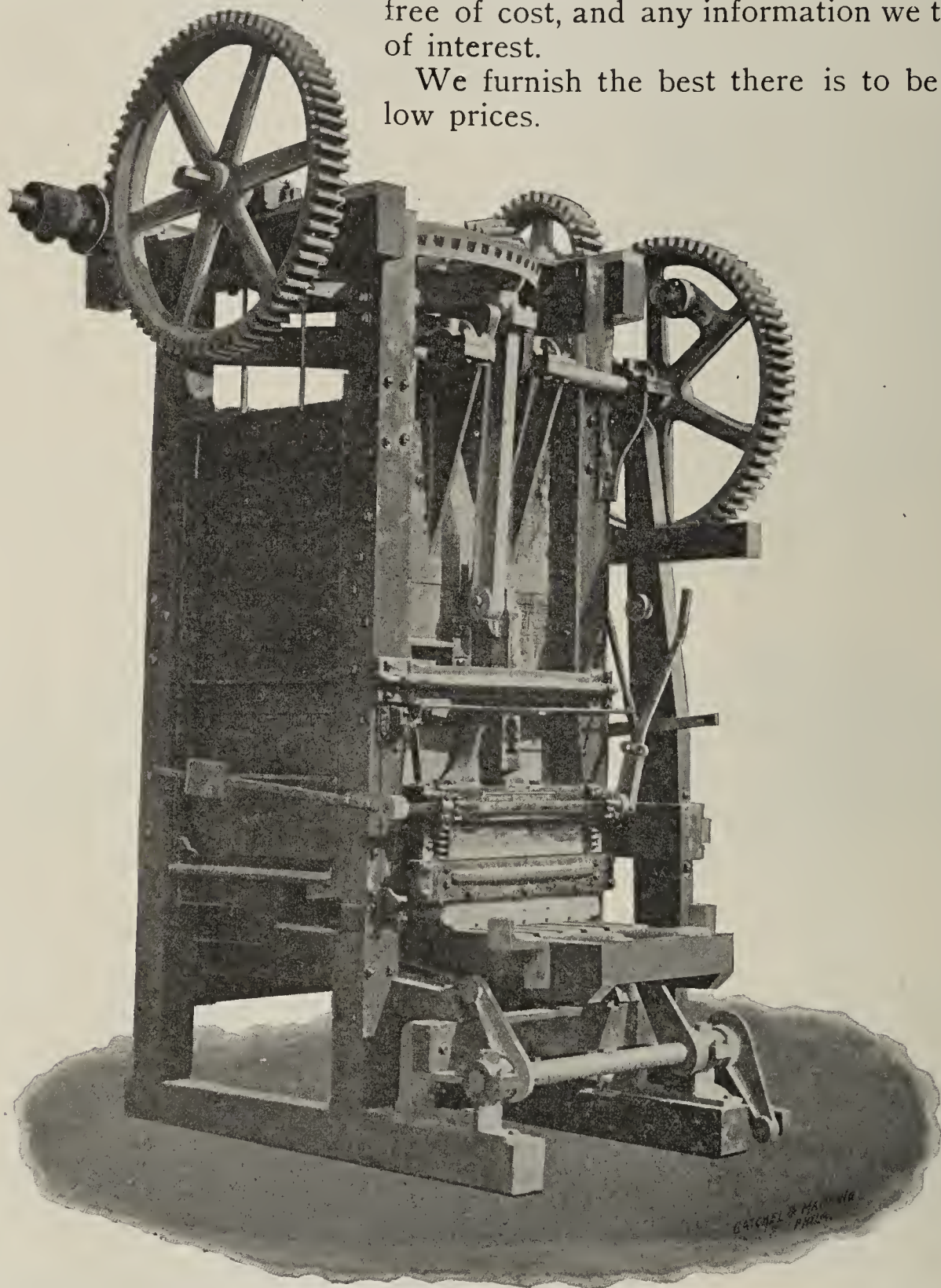
Leader Manufacturing Co.,
Decatur, Ill.



We Furnish Everything a Brickmaker Needs.

Let us furnish you with any information you want. We send plans of complete plants free of cost, and any information we think will be of interest.

We furnish the best there is to be had and at low prices.



Letter "A" Weight 10,000 Pounds.

ESTABLISHED 1857.

INCORPORATED 1887.

The Henry Martin Brick Machine Mfg. Co.,

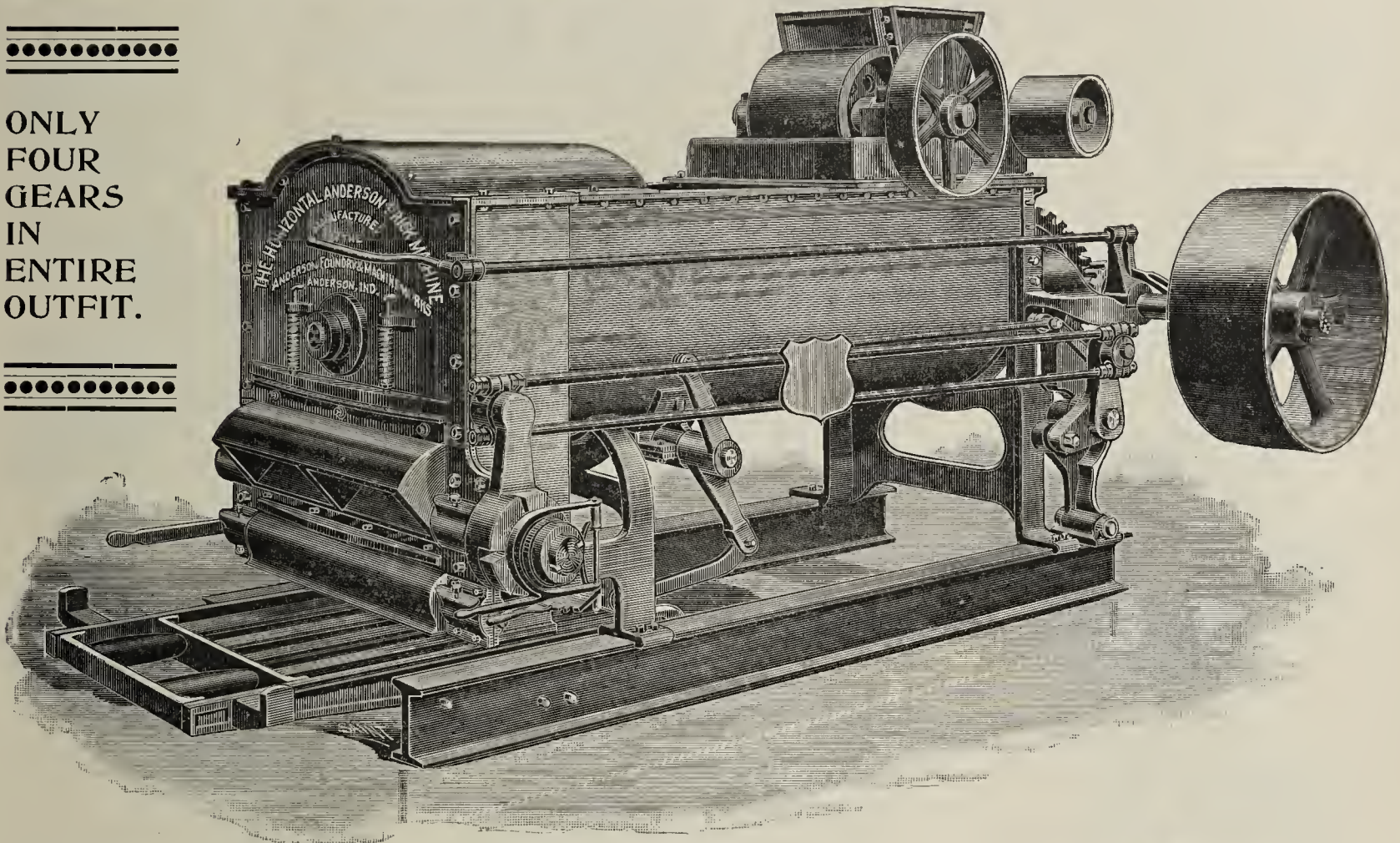
Send for our Illustrated Catalogue.

Lancaster, Penna., U. S. A.

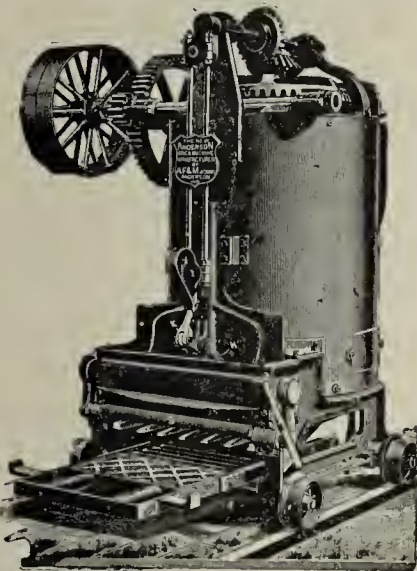
DON'T

Buy a Brick Machine until you Investigate the **HORIZONTAL ANDERSON**. The latest — the Strongest — Greatest Pressure and Pugging Capacity.

ONLY
FOUR
GEARS
IN
ENTIRE
OUTFIT.

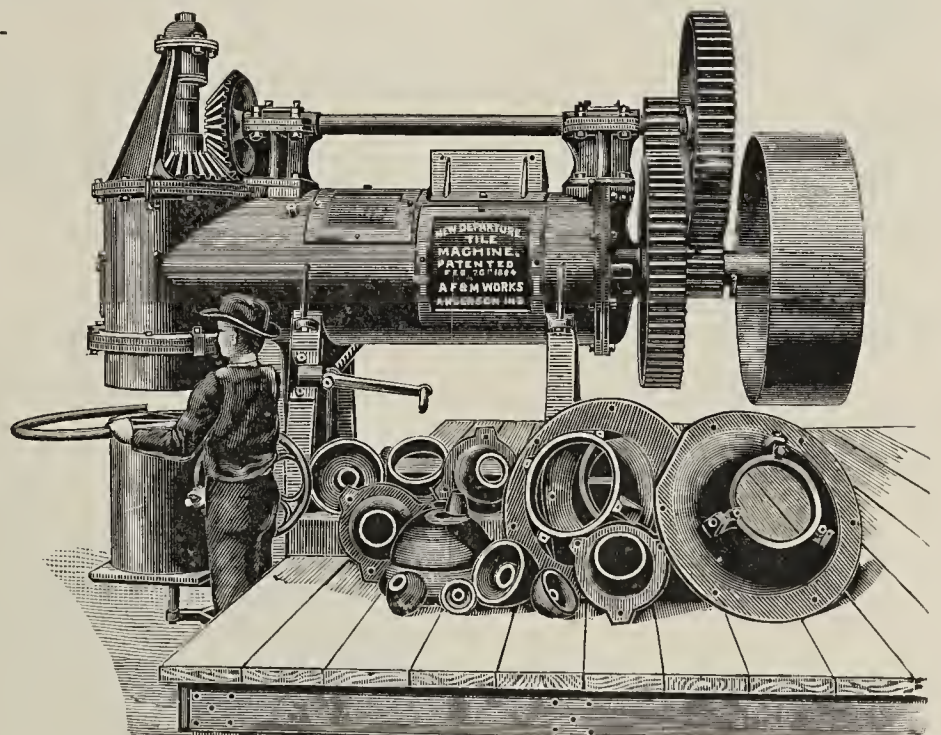


Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

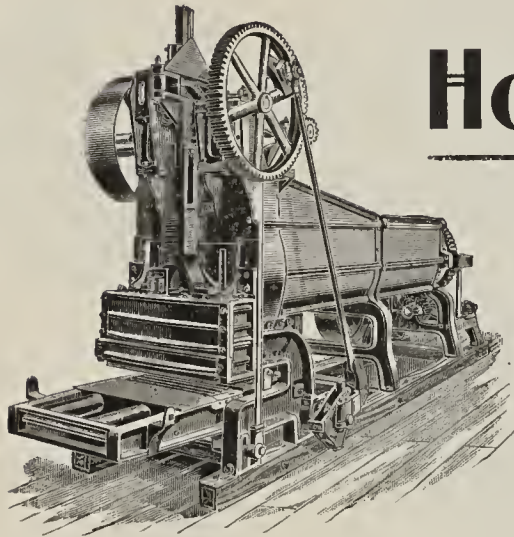
The NEW DEPARTURE TILE MILL.

The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

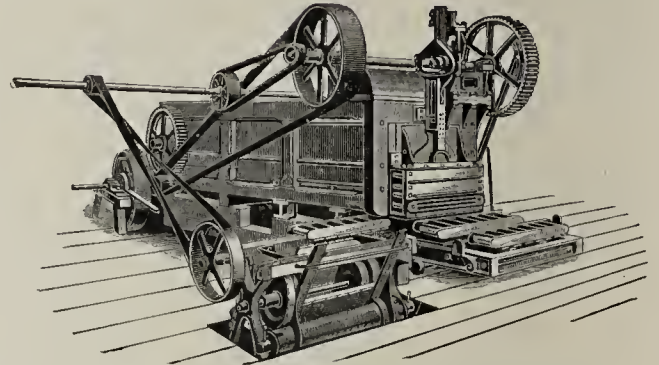
THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana

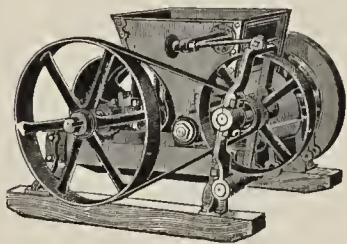
We Manufacture Anything You Need.



**Horizontal
Stock**

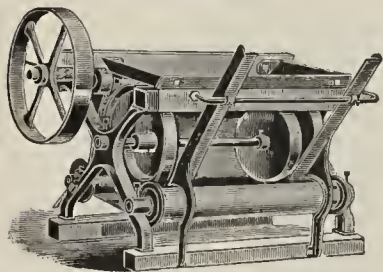


Brick Machines,



(PATENTED.)

*All Iron Vertical Machines,
Disintegrators, Mould Sanders,
Pug Mills for all purposes,
Granulators, Conveyors,
Cars, Winding Drums,*



(PATENTED.)

*Brick Moulds (machine or hand),
Trucks, Barrows,
Kiln Castings,
Pulleys and Shafting.*

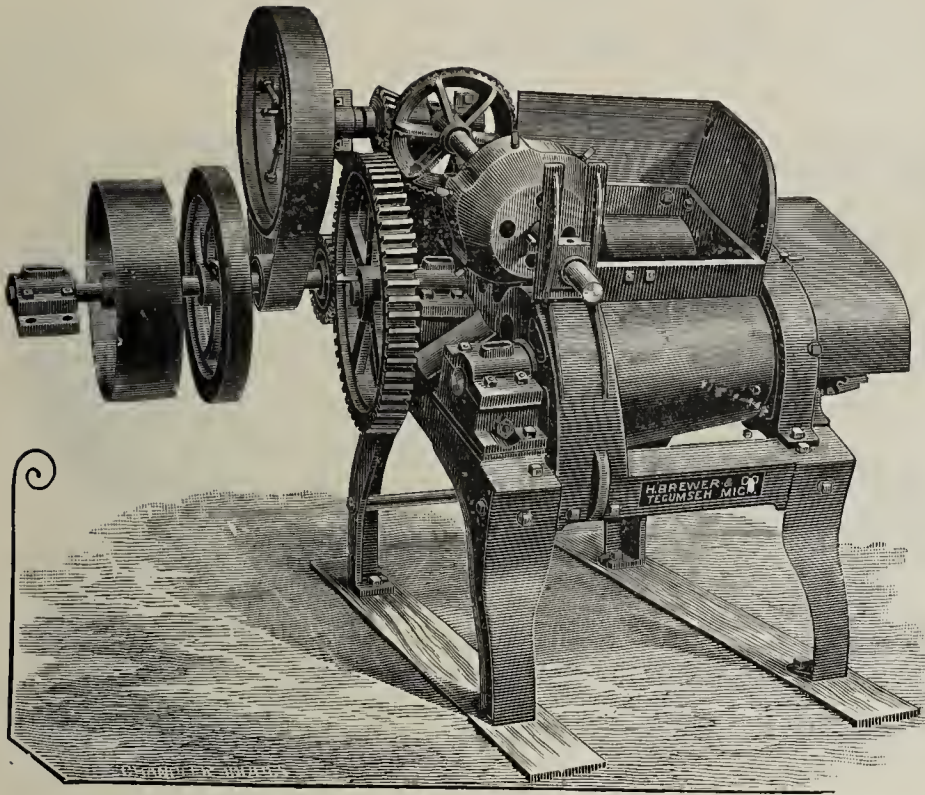
We are prepared to furnish any of the above goods promptly at prices and terms which we know will satisfy you.

If in need of any supplies or Machinery it will pay you to write for prices and terms to

C. & A. POTTS & CO.,

420-428 West Washington St.,

INDIANAPOLIS, IND.

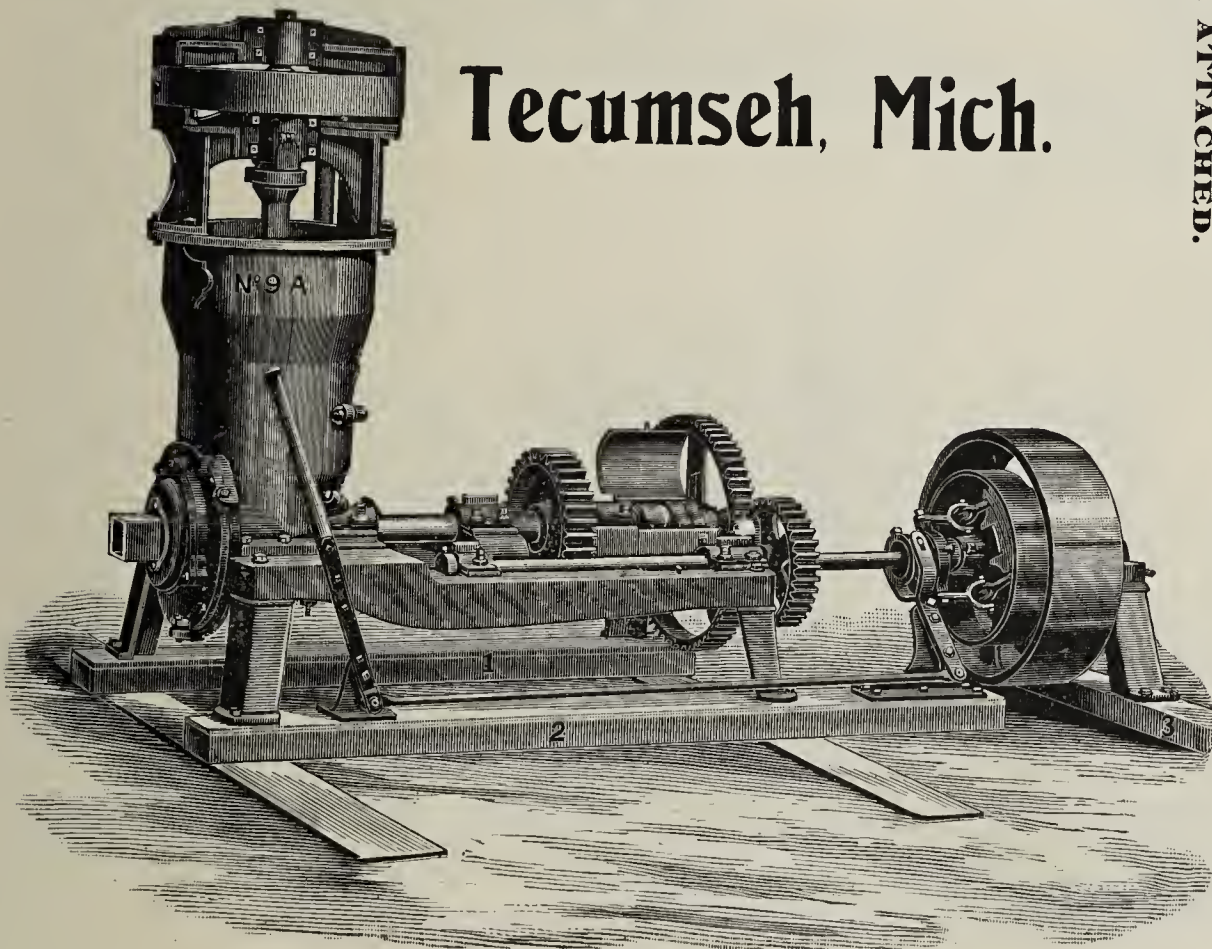


STONE EXTRACTING CLAY CRUSHER.

Manufactured by

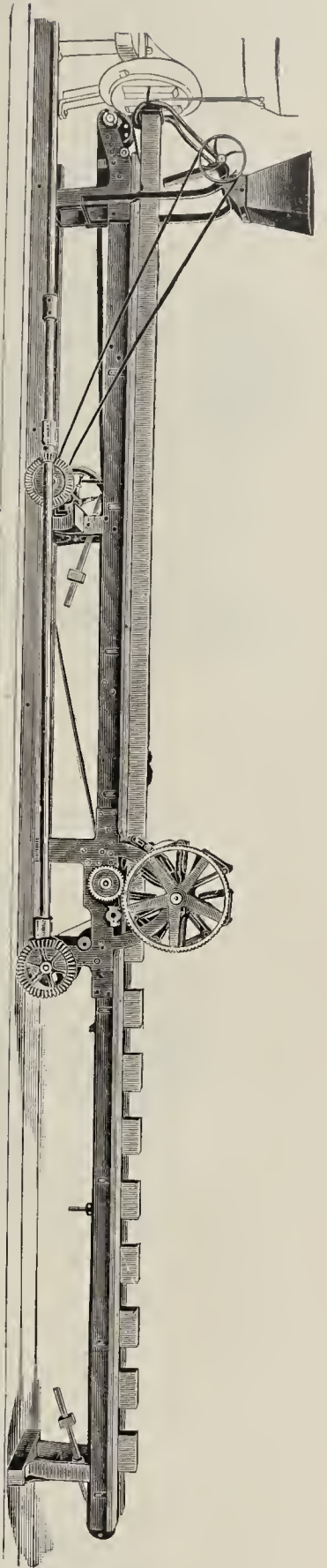
H. Brewer & Co.,

Tecumseh, Mich.

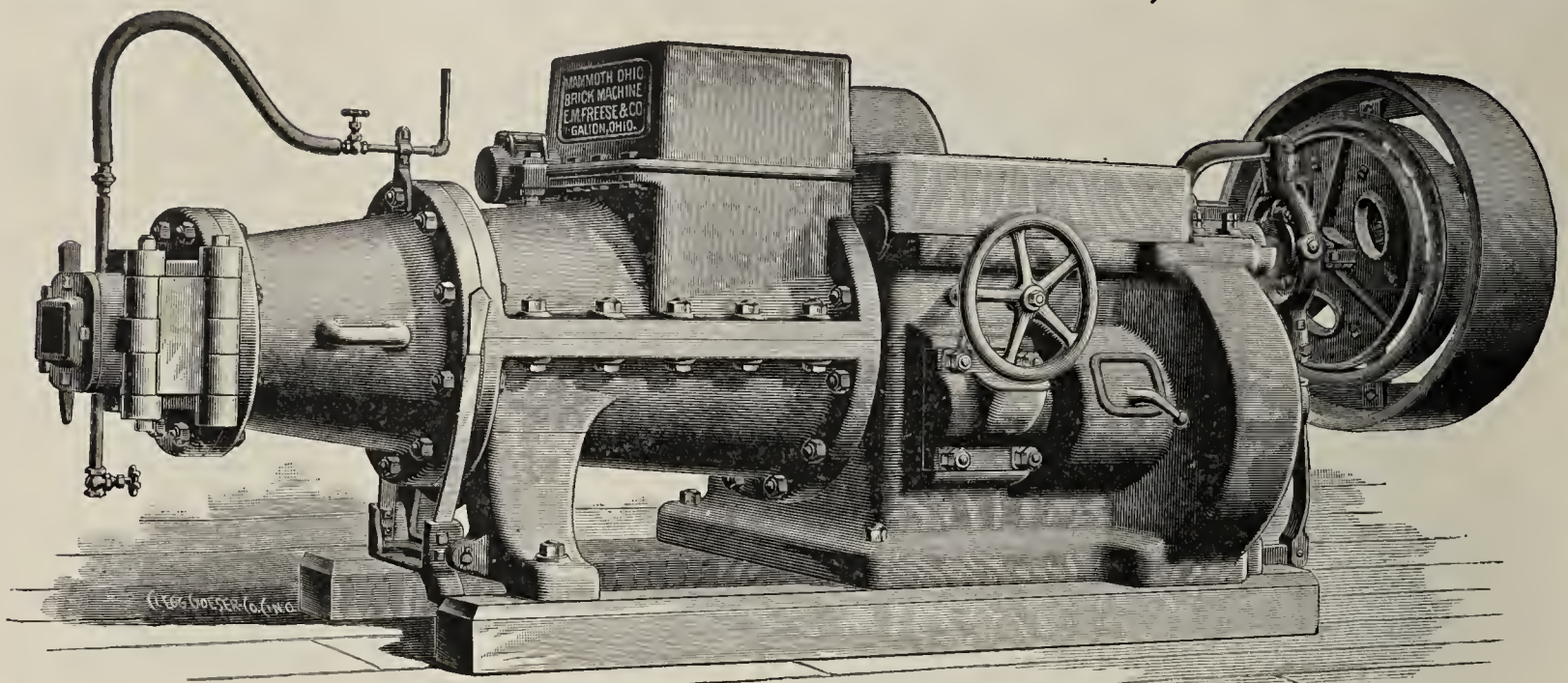


No. 9 "A" BRICK MACHINE.

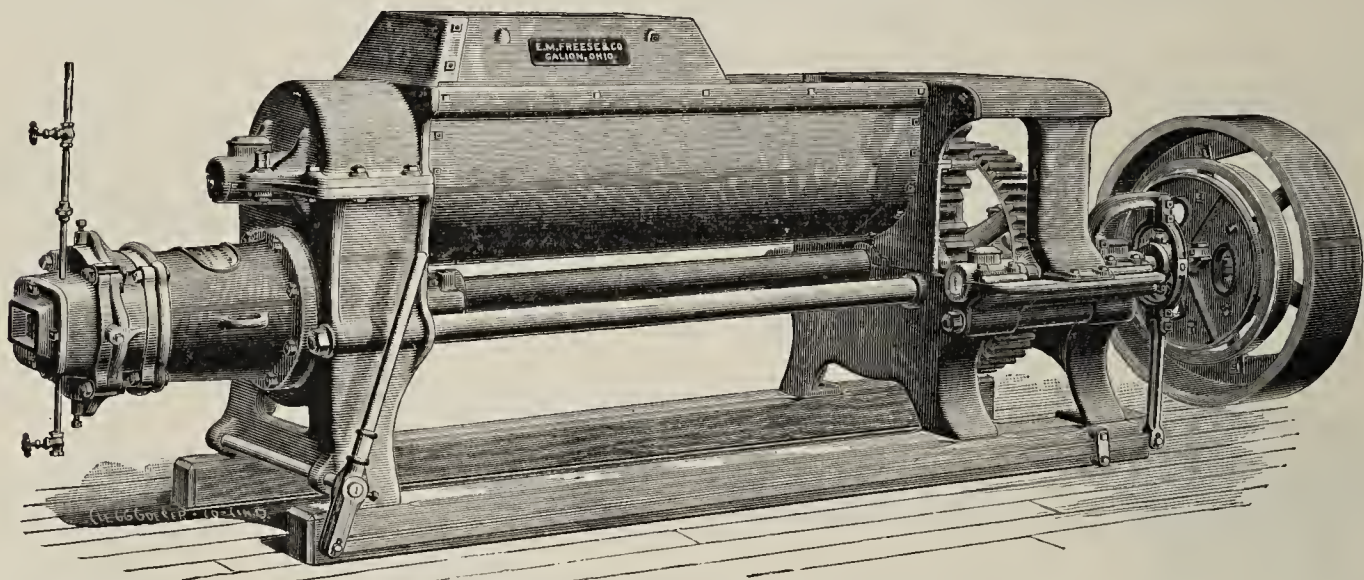
AUTOMATIC END CUT BRICK CUTTER with SANDER ATTACHED.



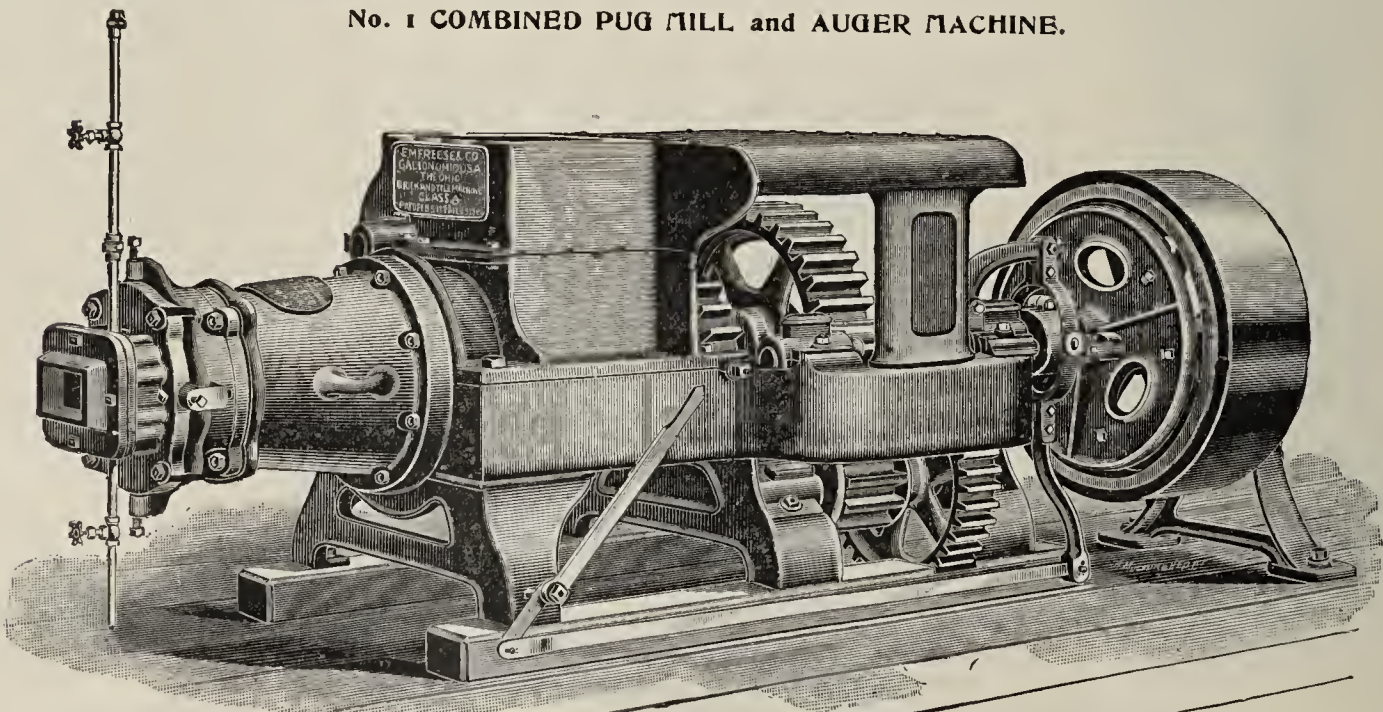
E. M. FREESE & CO., GALION, OHIO.



MAMMOTH BRICK MACHINE.



No. 1 COMBINED PUG MILL and AUGER MACHINE.



IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

Send for 136 page Catalogue.

"MADE RIGHT
and
RUN RIGHT."

• • •

Seven Successes.

GALESBURG, ILL., July 10, 1897.

AMERICAN CLAY-WORKING MACHINERY Co.,
Bucyrus, Ohio,

Gentlemen:—Replying to yours asking how we are pleased with your Re-Presses would say they are giving us *the very best of satisfaction* and I doubt if there are any re-pressing machines made *that need so little care and attention as the Eagle*. Outside of wear on mould boxes we have *no repairing*.

I do not recall a single repair we have ordered since re-presses were put in a year ago. We are repressing about one hundred and sixty thousand brick per day, one-third being 3x4x9 blocks. Yours truly

W. S. PURINGTON, Gen. M'g'r.

These people are using seven of our Eagle Re-Presses. They know them and like them. There are six other Eagles running in Galesburgh—13 in all. Our machinery is made right and runs right. We manufacture a complete line of Clayworking Machinery.

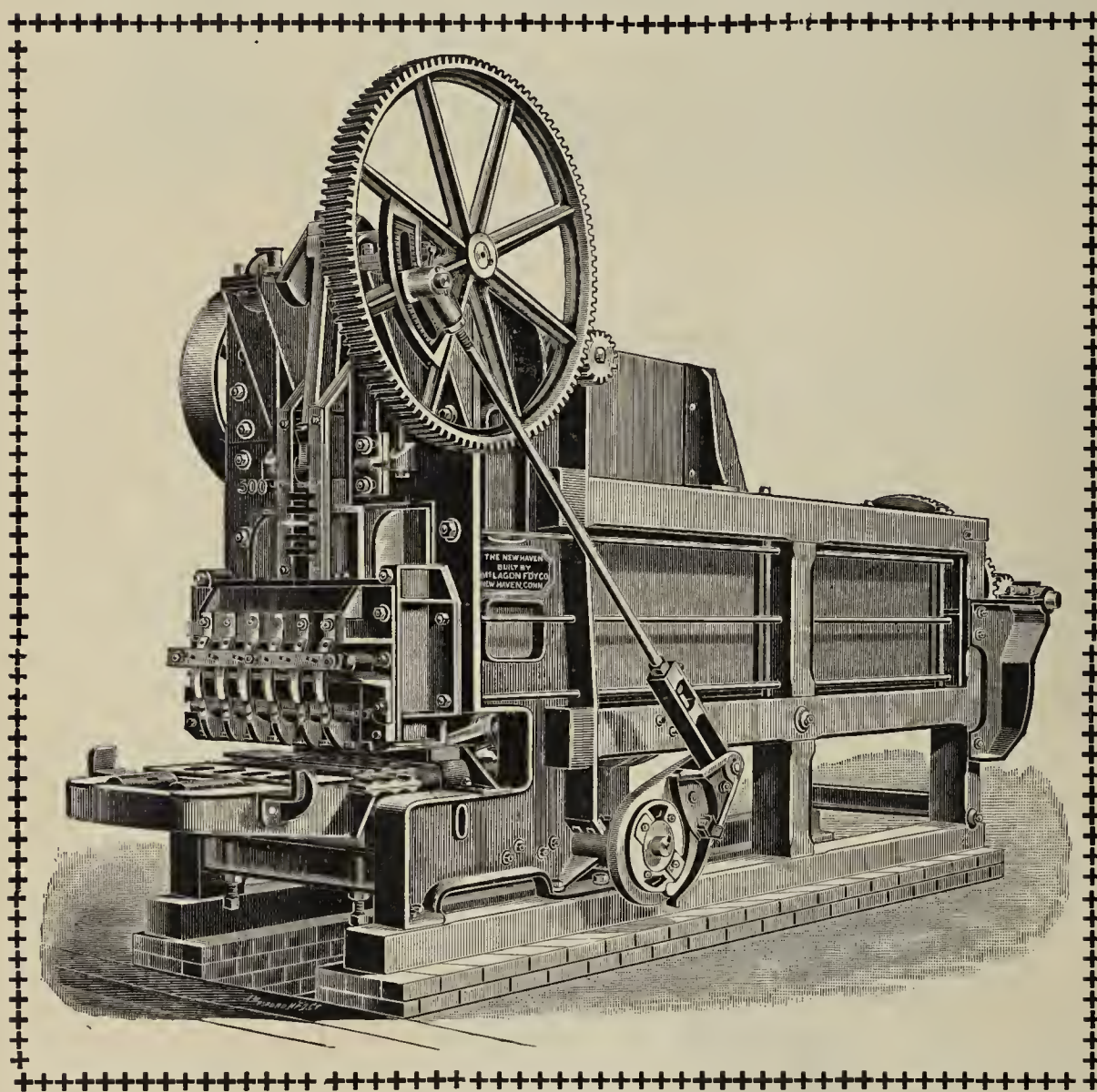
Send for Catalogue.

The American Clay-Working Machinery Co.,

Bucyrus, Ohio,
U. S. A.



“New Haven” Brick Machinery, Solid, Strong, Substantial Structures.



Soft Clay Ma-
chinery is Our
Specialty.

• •

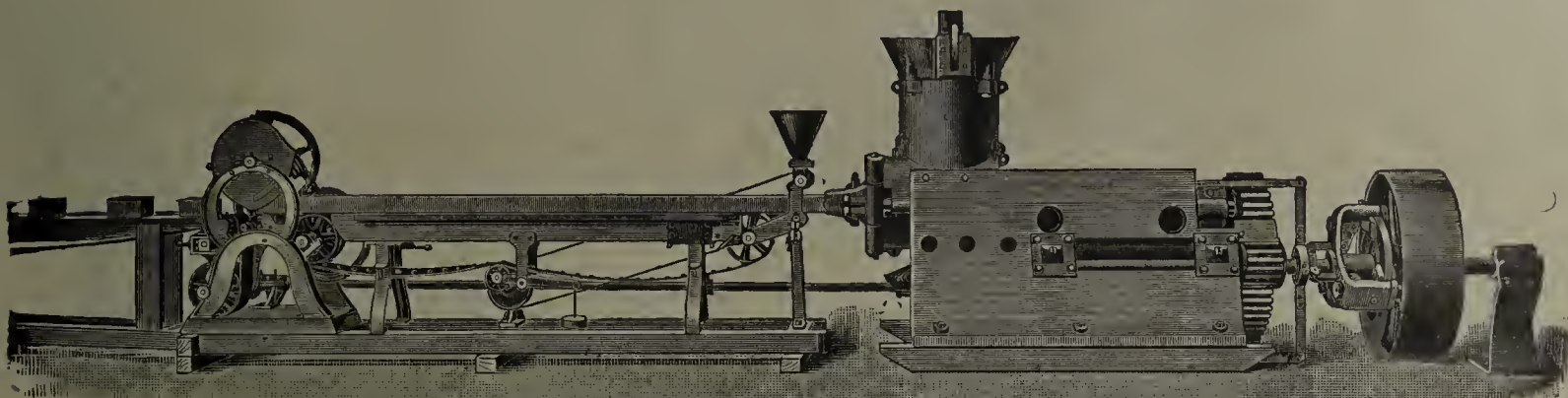
We propose to
Please each Pa-
tron.



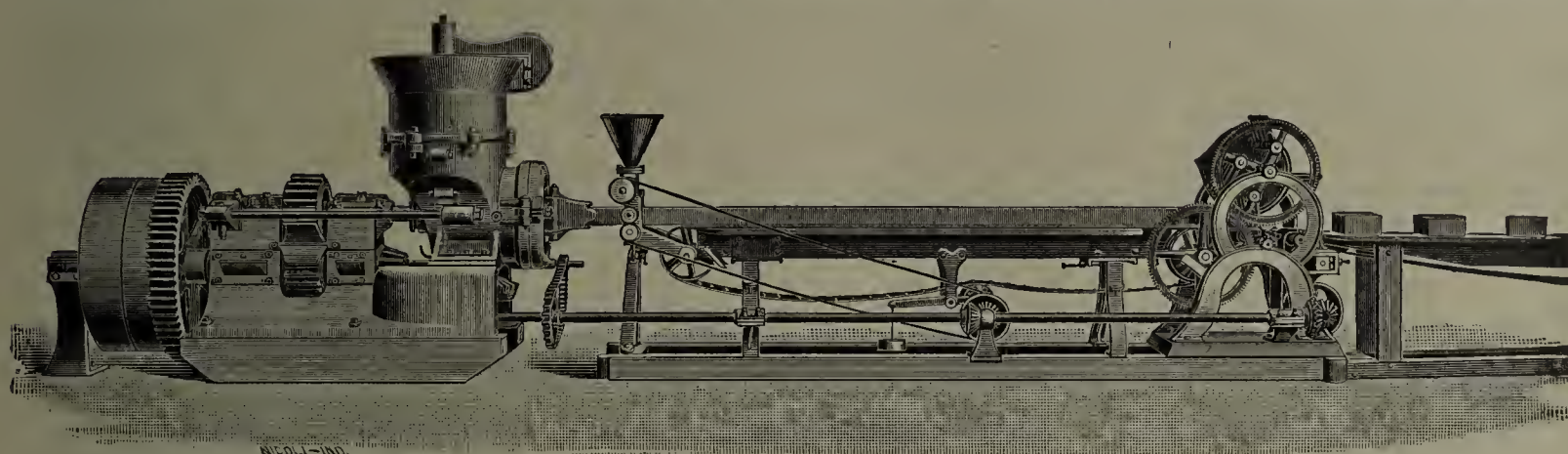
SEARCHING INQUIRY SOLICITED.

— ~ —
The Eastern Machinery Co.,
NEW HAVEN, CONN.

WONDER MACHINERY.



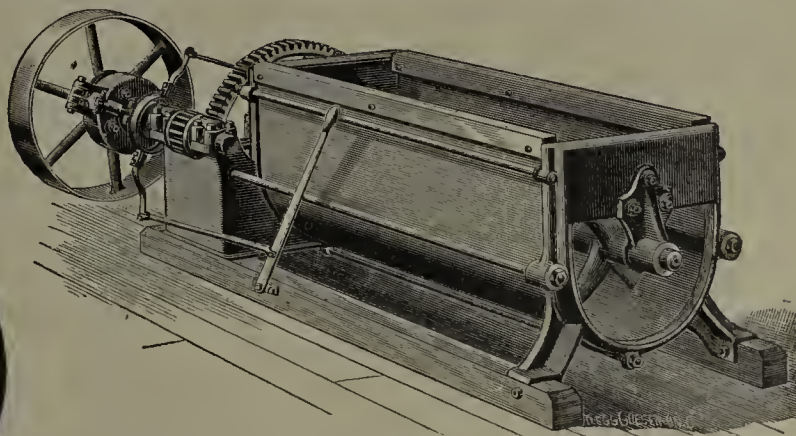
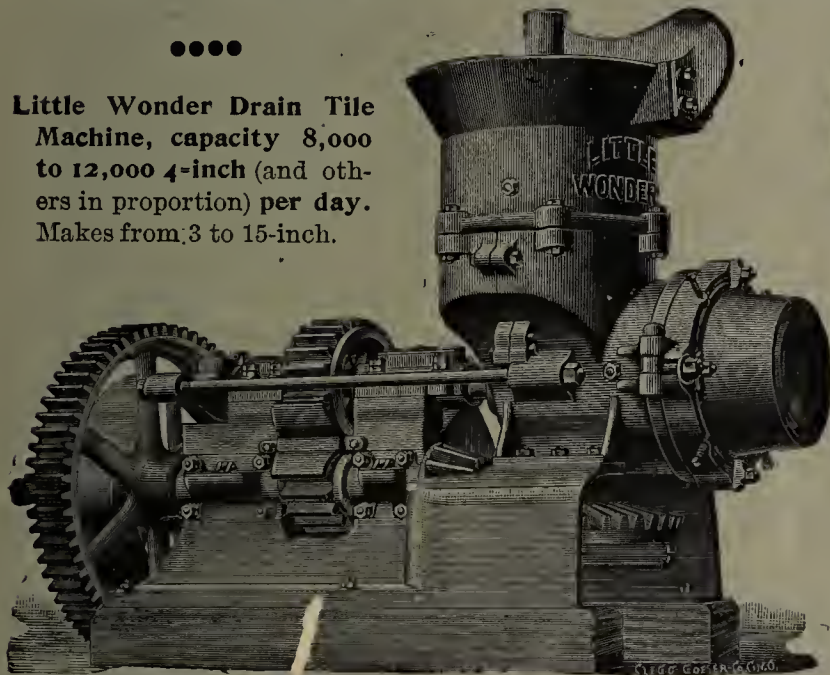
Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.



Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

••••

Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity.

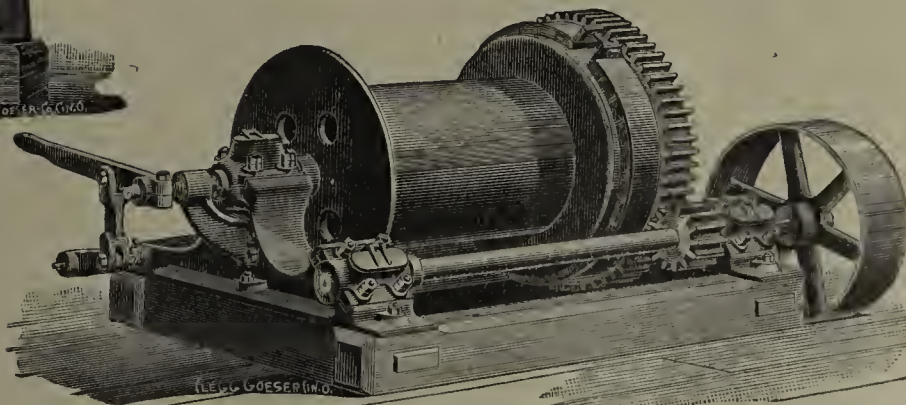
MANUFACTURED BY

The Wallace Mfg. Co.,
Frankfort, Ind.

CHICAGO AGENT:

Chicago Brick Machinery Co., Chicago, Ill.

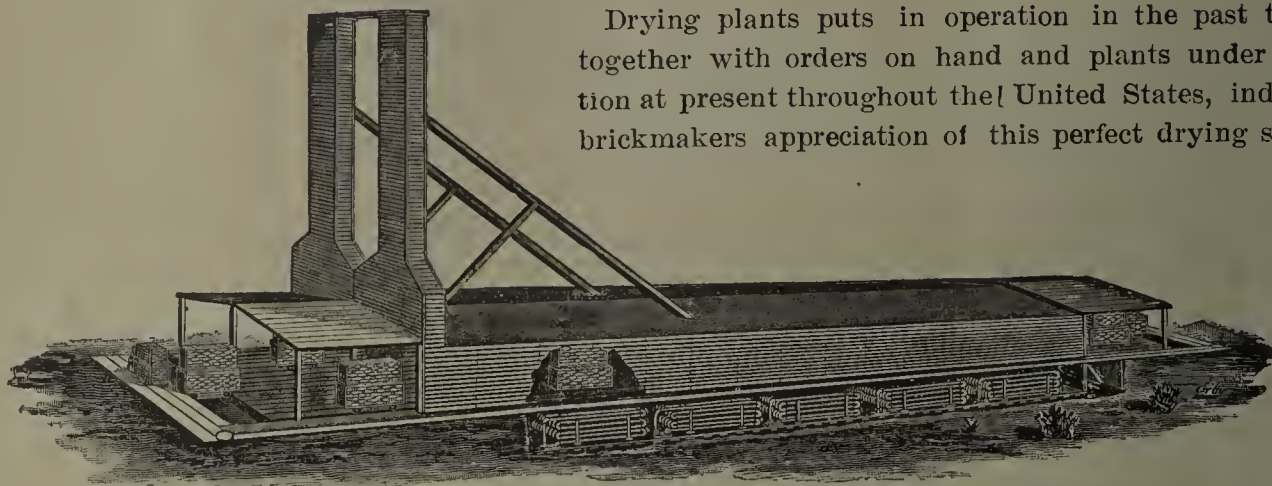
Catalogue Free.



18 x 30 Friction Geared Hoisting Drum.

Iron Clad Dryer.....IN THE LEAD

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

•SEE WHAT THEY SAY:•

WM. SANKEY, THOS. SANKEY,
WM. E. SANKEY, F. M. SANKEY,
T. H. SANKEY, J. F. SANKEY.

CAPACITY: 40,000 BRICK PER DAY.

TELEPHONES: { OFFICE, S. S. 11-3.
WORKS, S. S. 11-2.
WORKS, E. E. 589

SANKEY BROS., BRICK.

ORNAMENTAL PRESSED, SELECT STOCK, BUILDING, PAVING AND GUTTER BRICK.

SPECIAL AGENTS FOR MARTIN'S IMPROVED BRICK MACHINE.
RAILROAD SHIPPING A SPECIALTY.

OFFICE: 2101 Carson Street.

WORKS: Head of 18th Street, S. S.
Penn and Atlantic Aves., E. E.

PITTSBURGH, PA., May 3, 1897.

WOLFF DRYER CO., Chicago, Ill.

Gentlemen:—Replying to your inquiry regarding dry house at our east end plant, will say, that it is two years since we equipped that yard. We found the earthy deposit there would make the best quality of stock brick; soft mud process, but would not stand direct heat drying; such as we were accustomed to use, therefore concluded to test this brick in your dryer, resulting in our installing your system, producing results of a most satisfactory nature, proving the excellence and correctness of your system of absorbing moisture from centre to surface by drawing a volume of warm air through the brick, carrying off the moisture and leaving our brick perfect and bone dry, saving us money in burning and producing beautiful color.

Six months experience proved to us that it would pay to install your system at our South side works, which we did one year ago, with equal satisfaction. At this yard, we have shale clay manufacturing soft mud and dry-press brick and was equipped with the best kind of dry floor, heat supplied from natural gas; we sacrificed this and built an Iron-Clad under the same roof. This loss has been our gain; the quality of brick and saving in cost of drying enables us to show a fair profit, which is very pleasing, considering prevailing low prices for brick. We dry all our dry-press brick before setting in the kiln.

Respectfully yours,

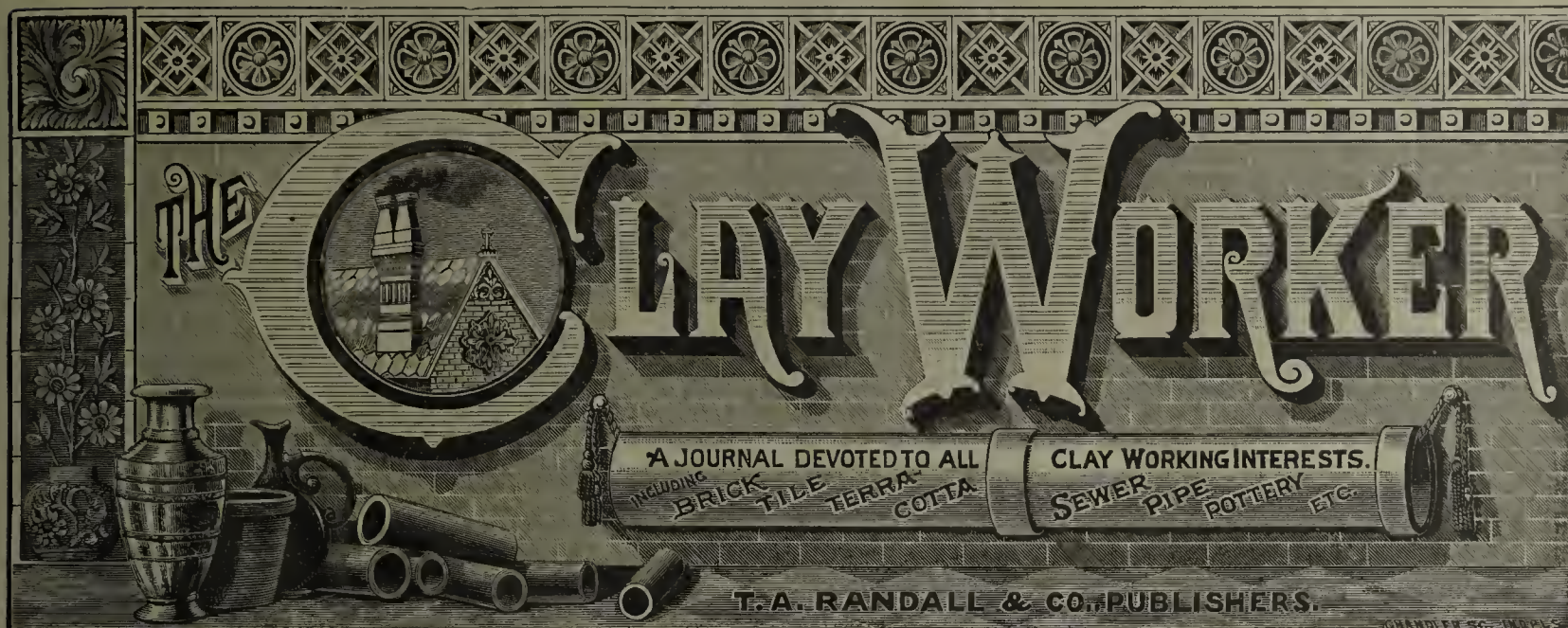
SANKEY BROTHERS.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVIII, No. 4.

INDIANAPOLIS, IND., OCTOBER, 1897.

\$2.00 a Year in Advance.

OUR SPECIALTY IS STIFF TEMPERED BRICK MAKING ...MACHINERY.

We aim to Build only the Best in its Class.

It has Paid our Customers to Buy and Use our Machines.

We Believe it would Pay You.

FOR SALE

One second-hand plain slide-valve Steam Engine, 12-24-inch cylinder, with pulley fly-wheel 8 feet in diameter by 17-inch face. Engine complete with governor and stop-valve, and by maker of good reputation. We will put in order and place f. o. b. cars Philadelphia for \$250. Address

Chambers Bros.' Co.
Philadelphia, Pa.

Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,

171 South Canal Street.

PHILADELPHIA, PA.

BRICKMEN

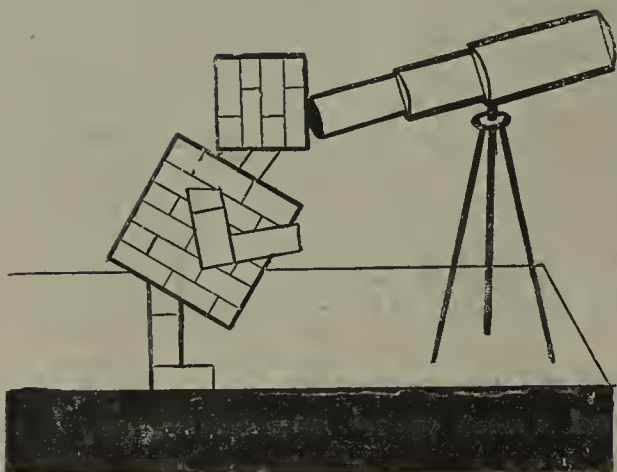
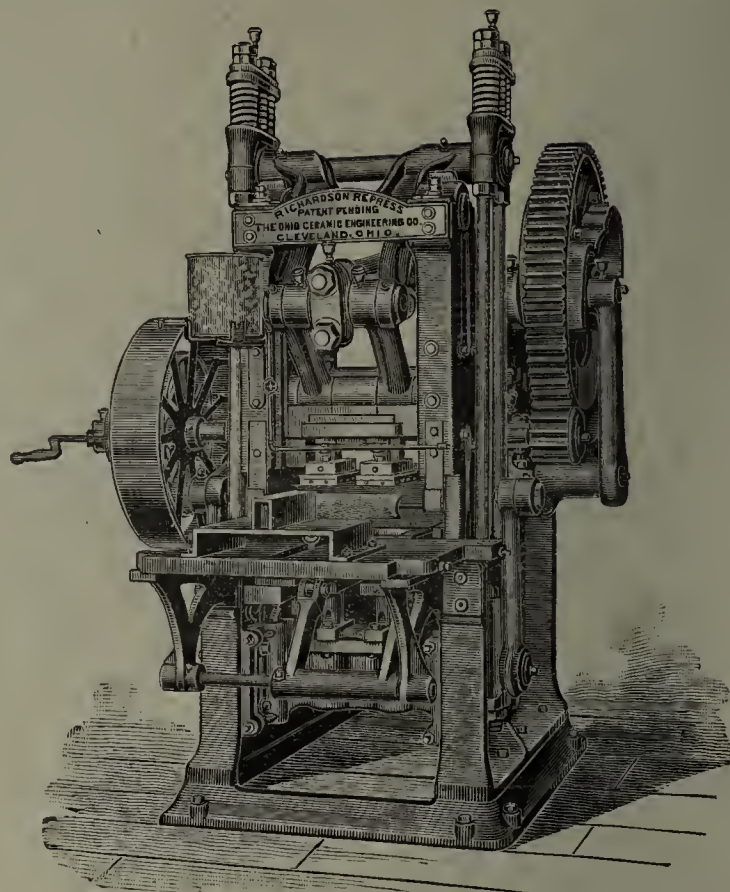
HAVE DISCOVERED THAT

"The Richardson"

IS THE BEST REPRESS
ON EARTH.

• • •

Let us Tell You About it.



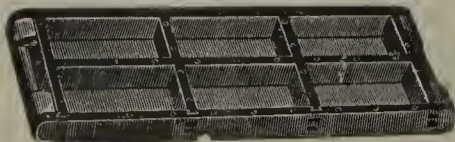
The Ohio Ceramic Engineering Co.,
Cleveland, Ohio.

Brick Moulds at a Discount.

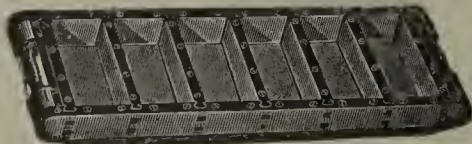
On and after June 1st, you can get 20 per cent off the list on Machine Moulds and other supplies, at reduced prices. If you have not got the LIST, send for it. Address the largest and most complete works of the kind in the world.



3 Brick Hand Mold.



6 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

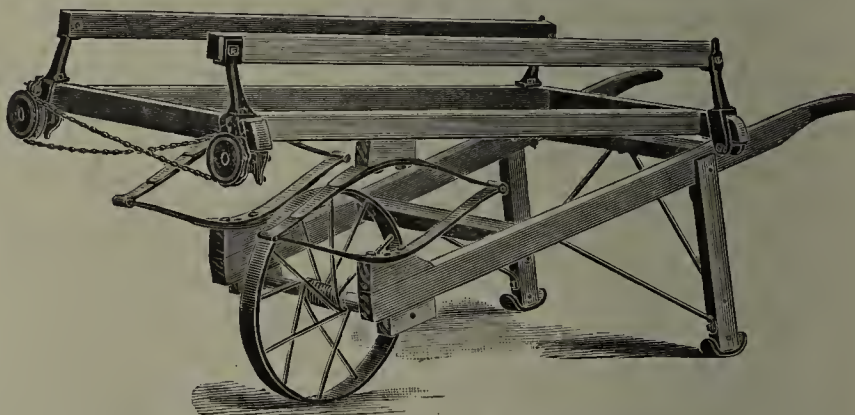
Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

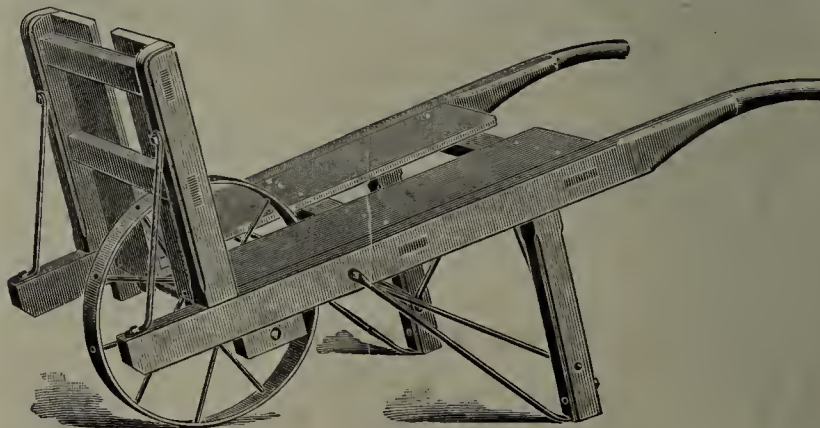
Send for catalogue and price list. Address,

D. J. C. ARNOLD, New London, Ohio.

TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market.
BARROWS, For various purposes. Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind

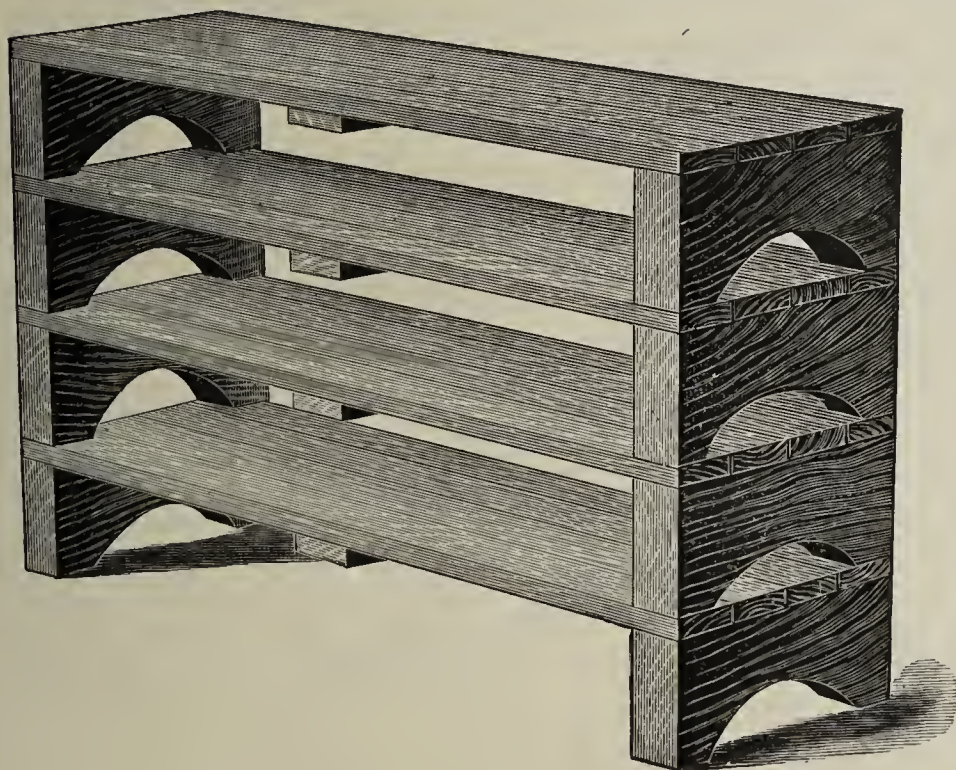


No. 4 Brick Barrow.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.



IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also *Decks for Dry Cars.*

We can ship them anywhere.

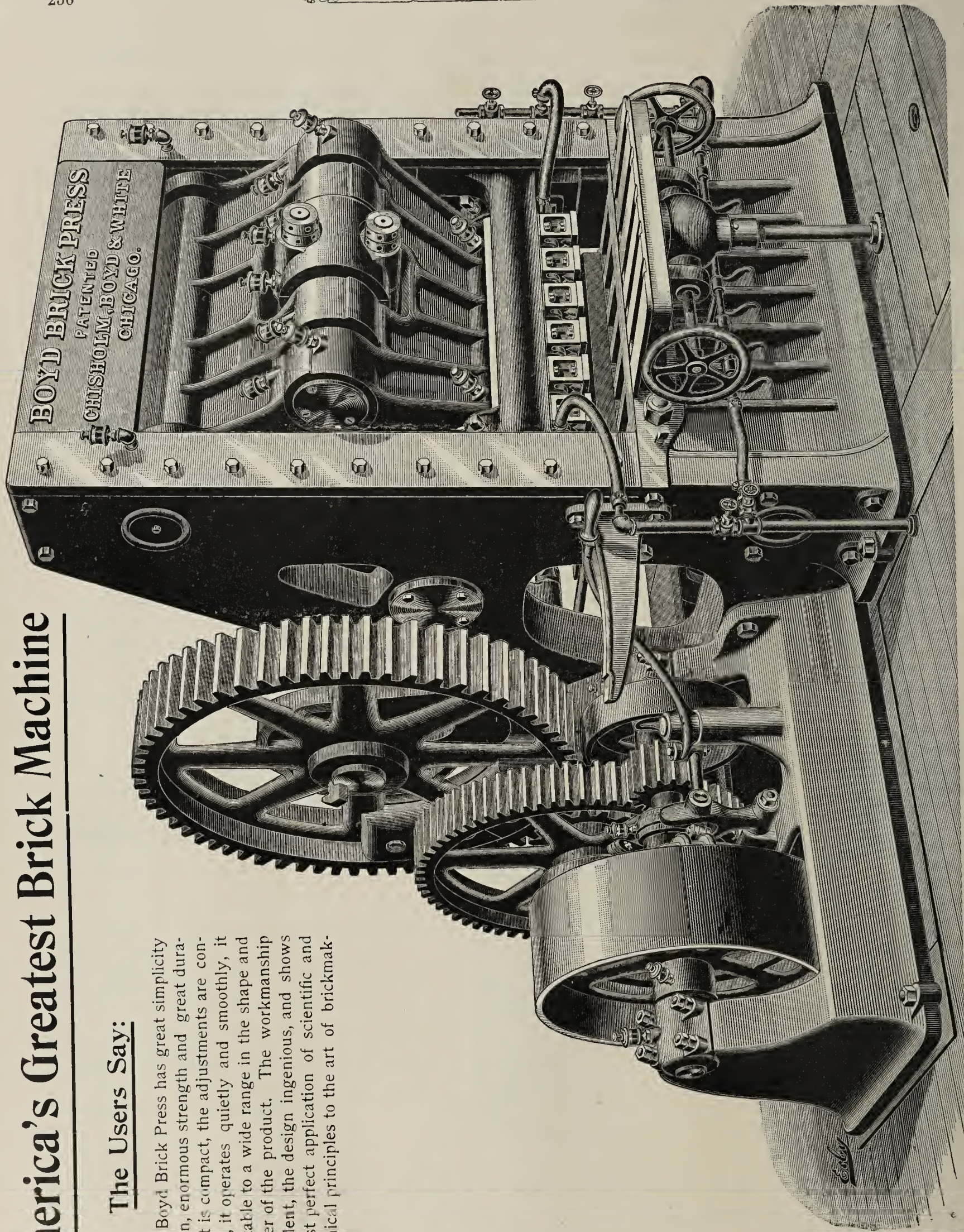
Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., - Saginaw, East Side, Mich.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

CLAY WORKING MACHINERY

The Simpson Brick Press.

The World's Standard.

Used by the most successful brickyards throughout the United States and Canada.

We manufacture a complete line of Clay-working machinery.

Do not experiment. Invest your money in a **SURE THING.**

Complete plants constructed and guaranteed. Write for catalogue.

**The Simpson
Brick Press Co.,**

Manufacturers and
Contracting Engineers,

OFFICE AND WORKS:

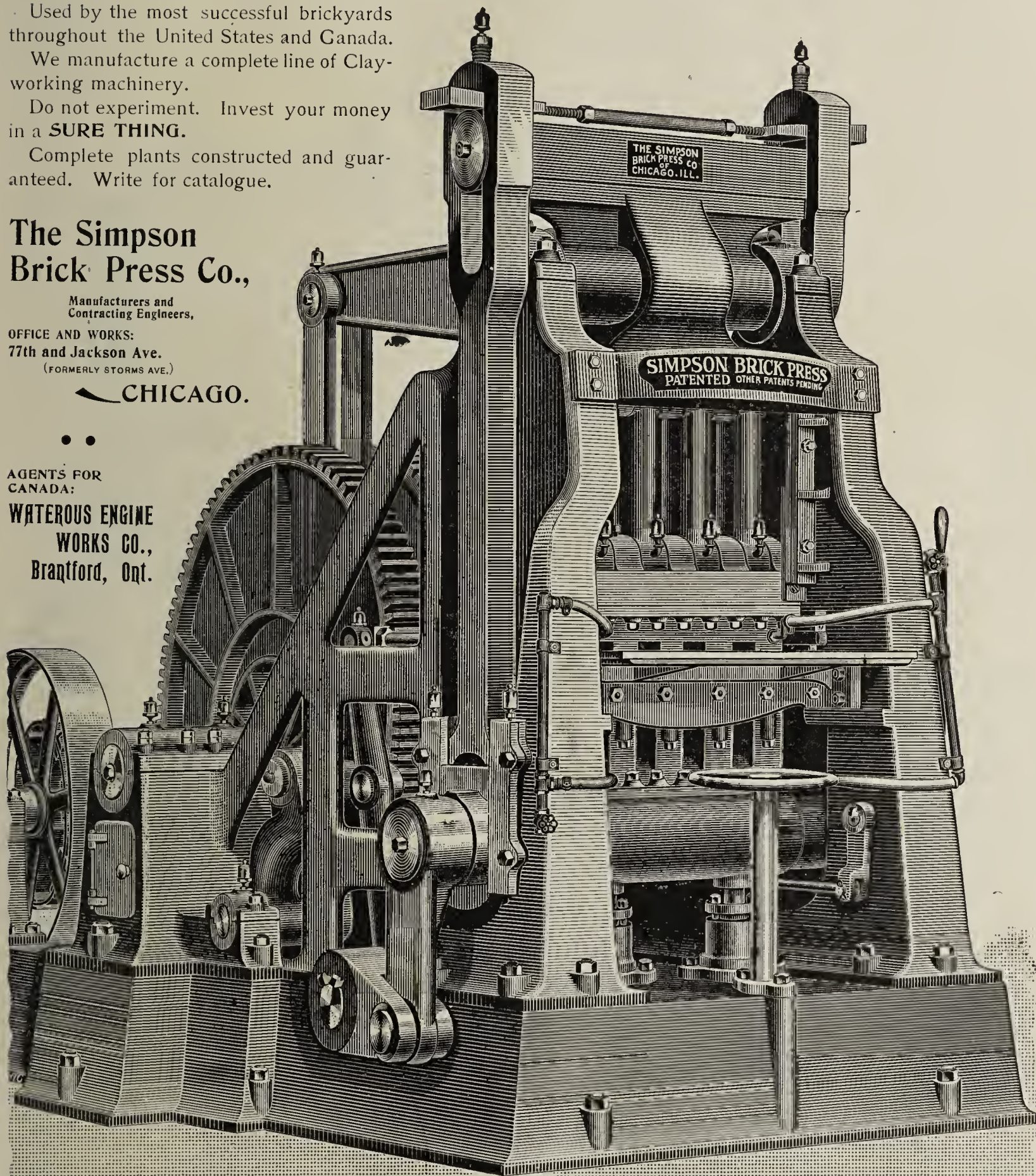
77th and Jackson Ave.

(FORMERLY STORMS AVE.)

CHICAGO.

AGENTS FOR
CANADA:

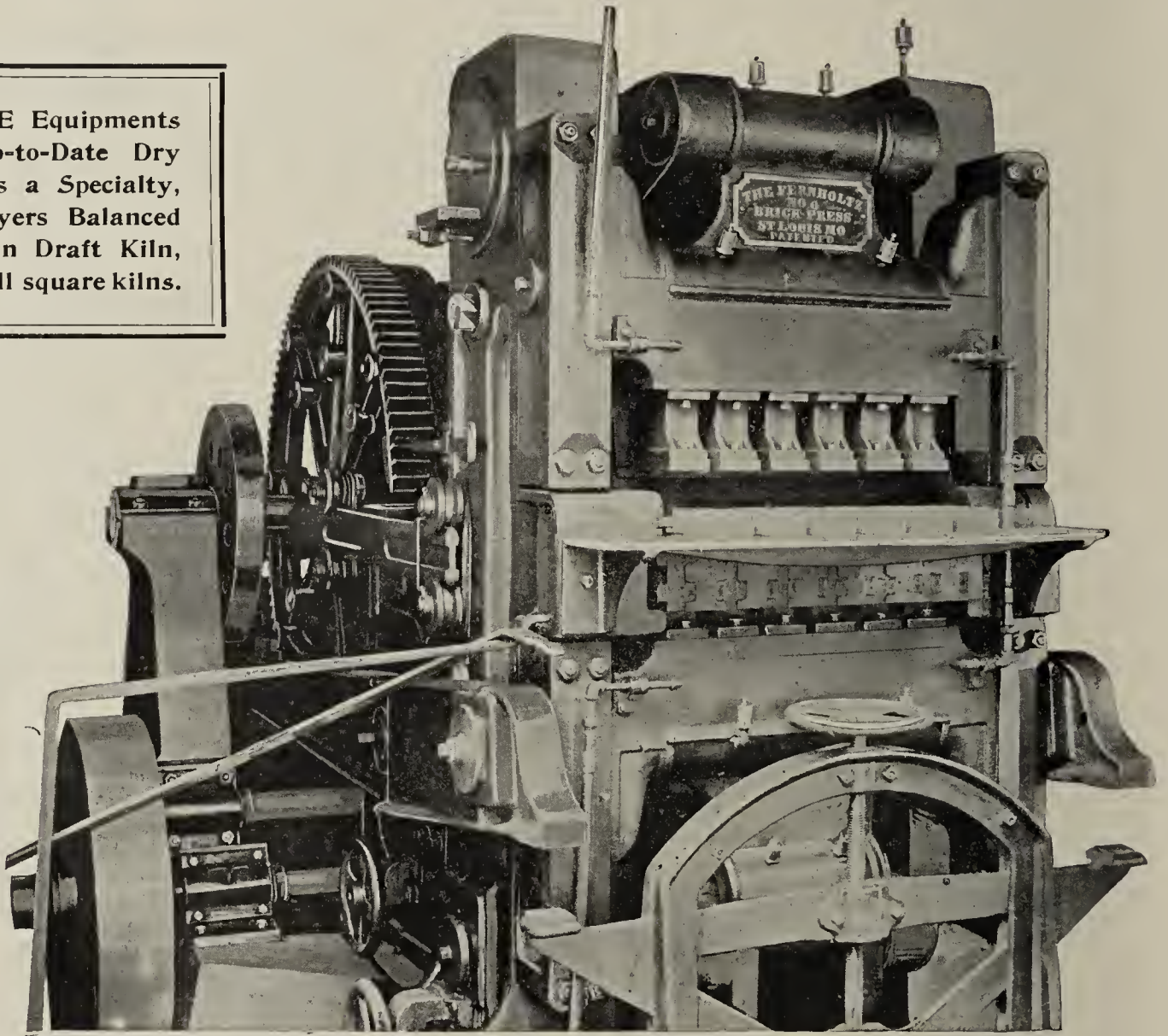
**WATEROUS ENGINE
WORKS CO.,**
Brantford, Ont.



The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMplete Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

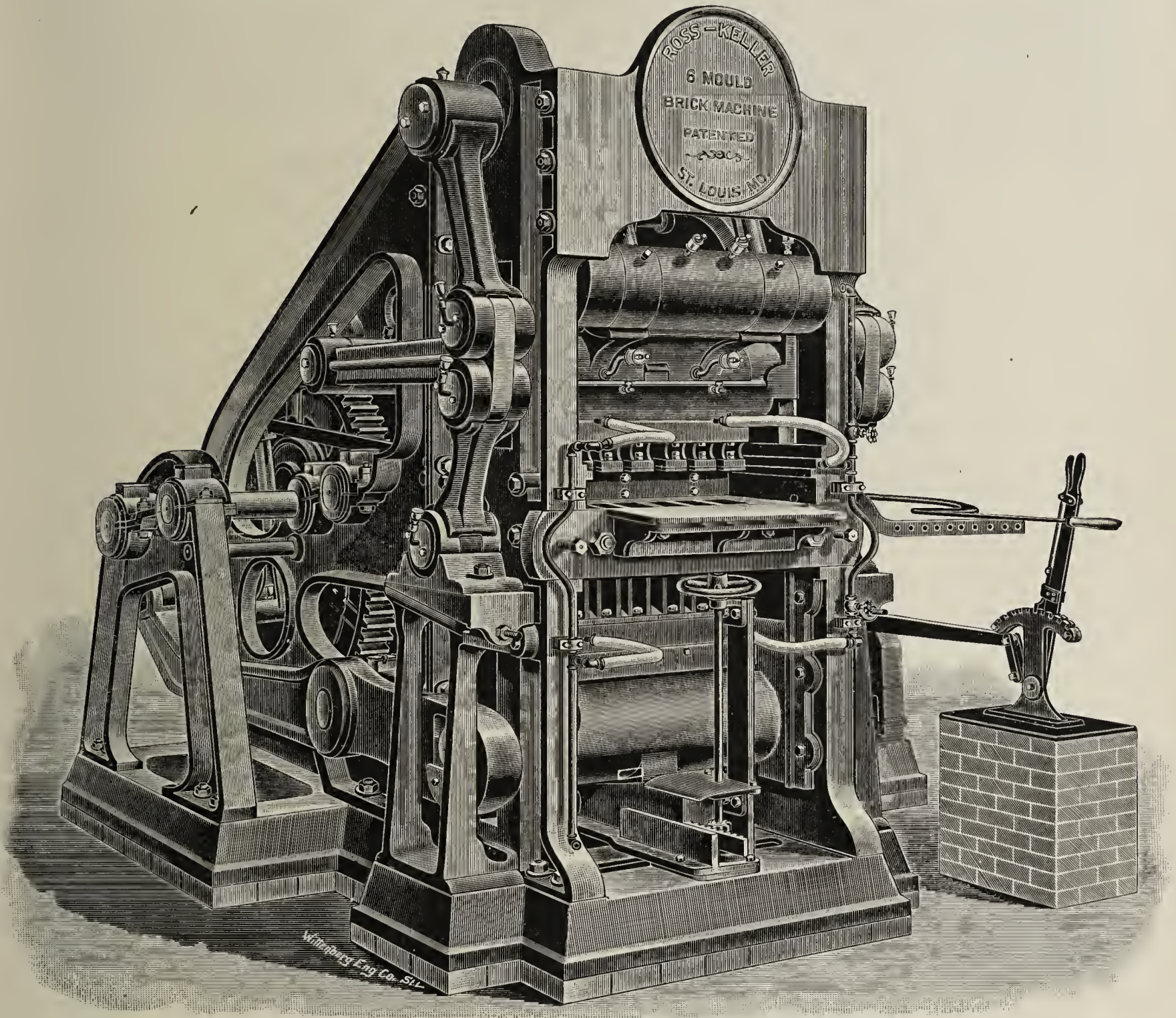
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



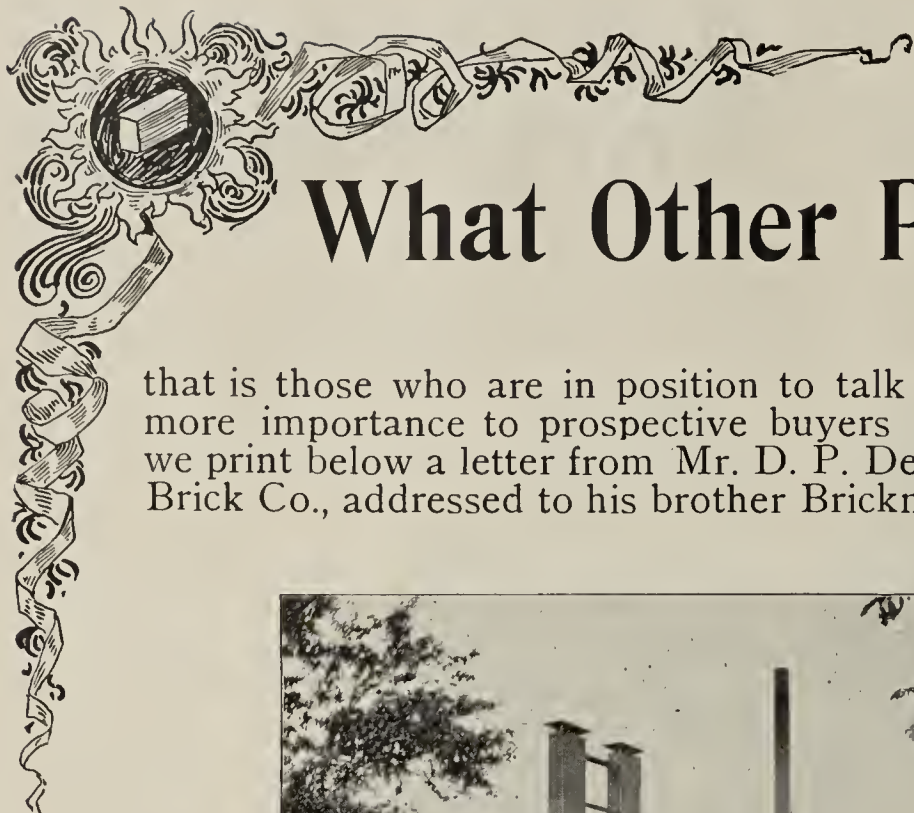
The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

ST. LOUIS, MO., U. S. A.



What Other People Say

About our DRIER, that is those who are in position to talk about it intelligently, is probably of more importance to prospective buyers than what we say ourselves. Hence we print below a letter from Mr. D. P. DeLong, Proprietor of the Glens Falls Brick Co., addressed to his brother Brickmakers under date of July 10, 1897.



Glens Falls Brick Co's Plant, Glens Falls, N. Y.

"Having made brick for nine years on an open yard, and for the past three years having studied the question of drying pretty thoroughly, I opened a correspondence with The Standard Dry Kiln Co., of Indianapolis, Ind., which resulted in my placing an order with them last October for one of their eight track Patent Natural Draft Driers to be in readiness for drying brick May 1st.

They sent one of their men to superintend its construction; he having charge of setting of boiler (as my power for making brick is water) and all other work in connection with Drier; after putting in about five miles of piping and making all connections and getting steam into Drier, there was absolutely not a leak anywhere. What stronger endorsement of workmanship and material used could be given than the above.

Now as to the Drier, it was put in under a guarantee to dry 30 M soft mud brick per day and it has been drying my brick perfectly satisfactory for two months and I see no reason why it will not continue to do so indefinitely.

As for the "Standard" people I can only add that my business relations with them have been of the pleasantest from first to last.

Brother Brickmakers of the N. B. M. A. (or otherwise) if any of you contemplate putting in a Drier, do not fail to correspond with this company."

(Signed) D. P. DeLONG, Prop.,
Glens Falls Brick Co.

The Standard is the Drier that does not disappoint. It invariably does all and a little more than is claimed for it. It pleases in every instance.

Let us send you our catalog and make you an estimate. This much won't cost you anything.

....

The Standard Dry Kiln Co.,

186 South Meridian St., INDIANAPOLIS, IND.



THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVIII.

INDIANAPOLIS, IND., OCTOBER, 1897.

No. 4.

Written for the CLAY-WORKER

AMERICAN ARCHITECTURE IN CLAY.

THE ILLUSTRATION accompanying this article gives an attractive picture of the very beautiful city residence of Mr. John F. Jelke, situated at 516 La Salle avenue, Chicago, after designs by Beers, Clay & Dutton, architects.

It will be noticed that its architecture is of the semi-colonial type, and that the designer has been very successful in his treatment of it. The building is not a large one, and is placed on a small lot of only 35 feet front on the street. The elevation is of Roman tile of "old gold" color, from the first story window sills to the coping, with trimmings of terra cotta slightly contrasting in color with the brick. The ornamentation on the terra cotta is in low relief and carefully carries out the design in detail with fine effect, giving much character to the main entrance, the mullion window and cornice, which are the ornate features of the design. The basement and stoop are of brown sand stone, with treads of Vermont granite of light shade.

This building is unique on this fashionable thoroughfare in its being built of a material which abso-

lutely refuses to absorb or retain any dirt or coal soot upon its face, and its owner and the architects have good reason to congratulate themselves upon their success in securing a brick of a beautiful and attractive color that will remain new and bright in appearance while all along the avenue structures built of other materials, either of brick or stone, are soiled and have their attractiveness marred by the soot, which is present in the atmosphere of this as well as many other portions of Chicago.

The Roman tiles used in this attractive home were furnished by the Sayre & Fisher Company, of Sayreville, N. J., and are known as their "Number 47 old gold." Of course, these brick, which are among the best made in New Jersey, and the best offered in the New York and other Eastern markets, are quite expensive in their first cost, are much more so delivered at the building site in Chicago, with freight at \$14 per thousand added. For those who desire the very best materials in their construction and can afford to pay the additional cost, the reward is manifest. Certainly it must be a source of daily gratification to Mr. Jelke and his household, as well as the architects, to see such gratifying results as the reward of their careful forethought in selecting materials for this attractive home.



A CHICAGO RESIDENCE BUILT OF JERSEY WATERLOO BRICK.

The difference in cost of these brick over those made nearer the Chicago market does not add very much to the cost of the building, and I think most people who are contemplating building are prone to think it does not matter very much what brick is used, so its a brick, and can from any standpoint be called good, while in fact there is perhaps no one portion of a structure worthy of more careful consideration. After the face of a building is laid it is practically impossible to change it, and good or bad, pleasing or the reverse in its appearance, it must stand, either a thing of beauty, a pleasing picture or a perpetual discord and disappointment—a regret to its owners and occupants, and a blot upon the beauty of its surroundings and the street that gives it a place.

This building has been finished two years and during this time has been kept as clean and bright by the washings given it by the rains as it was on the day it was finished and cleaned down by the mason builder.

The Sayre & Fisher Company have furnished several important buildings in Chicago with material from their New Jersey factory, notably the Atwood building, Clark and Madison streets, Holibird & Rooche, architects; the Kenwood Club, Forty-seventh street and Lake avenue, and many large apartment houses and residences.

FAX.

Written for the CLAY-WORKER.

BRICKMAKING IN MAINE.



IN DISCUSSING the subject of brick machinery, which has been most exhaustively and intelligently done in previous numbers of the Clay-Worker, it seems to me the great difference in even good brick clays has been somewhat ignored. The statement lately made that there is no difficulty in making good bricks with the auger machine, by inference with any clay, seems a little broad, or that changes have been made in the process by which very serious difficulties have been overcome. Of many attempts to use the auger machine within my knowledge in this State, not one has been a success.

Whether the defect has been inherent in the system, the peculiarity of our clays, or the lack of proficiency on the part of the operators, I am unable to say. Sand-striking machines have succeeded better, though there are no bricks made on the Kennebec river with these machines. The "Martin" is the only sand machine used on the Penobscot river, and that in only one yard. It does good work and lots of it, the bricks being superior to those made in the soft mud machines in everything excepting color. They are more dense in texture, and therefore stronger, more uniform in size and quality, and will bring better prices in the Boston market than the soft mud bricks; but whenever a brickmaker undertakes to start a sand machine he is sure to encounter the opposition of the whole bricklaying fraternity, partly because sand bricks do not slip into place in the mortar as readily as the mud bricks, and partly, and more largely, from the natural opposition to any innovation which is likely to change the established order of things.

In many localities where the clay is difficult to work by the soft mud process, the sand machine would do good work with a great deal better results; but the great difficulty with them seems to be that they are none of them adapted to

—Small Yards.—

By far the larger portion of the bricks made in the State are in yards of from four to six hundred thousand capacity, employing but three or four men. As machines of the Martin type require nine or ten men to run them to advantage, it will be at once seen why they cannot be used much in these parts, whatever may be their merits. Down the num in

dentations of our coast line one can visit a dozen brick yards in half a day's walk in which the entire cost of fitting up either of them would fall short of the expense of a good sand machine. So it will be seen that the item of expense is quite a factor among these small brickmakers. I have been looking for years for a sand machine that would fill this place, but have not as yet heard of one, though I can see no difficulty in its production.

The great advantage in this class of machines over the old process is their adaptability to an inferior class of laborers. While good men are desirable around any machine, they are not as absolutely essential on a sand machine as on a mud machine. The men not being obliged to go half naked in the water makes it more comfortable, and it is not so difficult to get men to work on them at a lower rate of wages. The brickmaking season can be lengthened two or three weeks on each end by making sand bricks, as they can be run out in the spring as soon as it is done freezing, and until it freezes again in the fall, and when a machine is introduced adapted to the situation, it will doubtless be substituted largely for the present system.

—Incompetent Management the Cause of Many Failures.—

In many cases—some conspicuous ones within my knowledge—machines of established reputation have been tried, and failed, through no fault of the machines at all, but simply for lack of some one of experience or judgment to operate them. I think it a great mistake for proprietors of such machines to send them into new localities without providing for their having a fair trial. The proprietors of yards likely to put in new machinery are nearly always men engaged in other business, and who have no practical knowledge of brickmaking. The chances are that they will have a foreman nearly as ignorant as themselves, and who is almost sure to be prejudiced against the introduction of anything new which is likely to call for the exercise of some ability which he is conscious he does not possess. They may have seen the machine in successful operation under favorable conditions for that particular machine, none of which conditions they can supply, or they may have been misled by the eloquent laudations of beautifully decorated circulars into expecting much more of the machine than it is able to perform, the result being failure and disappointment, and the condemnation of the machine in that section for all coming time.

There is probably no machine but is a good machine for some place; but when it is claimed any machine can do universally good work under so wide a range of conditions as the different clays in our country supply, it is claiming more than experience has demonstrated they can perform.

—A Case in Point.—

There is a brickyard within a half dozen miles of where I live which is a good example of what I have been writing. Some years ago it came into the hands of two gentlemen of means and progressive ideas. Knowing nothing of the business, they naturally looked upon the old-fashioned process as primitive and out of date. They put in steam power and an auger machine. After making two or three kilns, which nobody would buy, they threw the machine aside and put in a sand machine of established reputation. Nobody on the yard had ever seen a sand machine in operation. Taking some damp loam from the nearest bank for molding-sand, they started up. The clay went into the molds all right, but manifested such a decided tendency to stay there that the proprietors, who were witnessing the operation, became disgusted and ordered the machine dumped off the yard, and it is lying there now. The engine and boiler soon followed, and they have been making bricks by the old process ever since. Had the proprietors of the machine sent a man to set it up and show them how to run it, it would in all probability be running there to-day, and also have been the means of selling other machines in the locality.

New Conditions.—

The development of transportation facilities has been a potent factor in bringing about the great changes in all branches of trade in this State, more especially those operating along the coast and up the rivers as far as navigable. Small brick-yards by the dozen may be seen now lying idle all along the coast and up the numerous rivers and creeks, which a few years ago were all in operation, making bricks almost exclusively for the Boston market. Freights were low, as bricks were largely carried as ballast for hay, dry wood and other light articles which the country produced. But the extension of railroad facilities has changed all that. The wood has been pretty nearly exhausted, or can be more profitably shipped from other points, while bricks can be transported by rail at a distance which would have been prohibitive a few years ago. The starting of the great brickmaking plants in the suburbs of the city of Boston, the governing policy of which has always been the crushing out of the small yards, regardless of dividends, has had the effect of keeping prices down; and while not exactly killing out all the small yards, has rendered their operations of a rather intermittent character. These little brickyards, from the elasticity of the system previously described, cannot be killed out very easily, as they can be shut down and opened again at any time without much loss. Any of the brickyards along the coast now lying idle could be set to running in a few days' time with the expenditure of a few dollars; so just as soon as the big concerns think they have them pretty well squelched, and advance the price with an eye to dividends, up spring dozens of these little concerns into life and activity, and the ruinous competition is again renewed.

Most of the proprietors of these small yards are farmers, and the yards are built on some part of the farm where the bricks can be wheeled on board the vessels. If a yard is shut down, it simply means the lying idle of perhaps an acre of nearly worthless land, and tools and fixtures to the amount of a couple of hundred dollars.

—Little Yards Unable to Compete with Large Ones.—

The inland brickyards, depending on local trade for support, in late years have suffered from competition from the same causes. Yards have been closed in many locations by competition from yards forty or fifty miles away. The margin of profit has become such an unknown quantity as no algebraic formula can determine.

In whatever other respects the business of brick manufacturing may differ under the wide range of conditions in this country, there seems to be one universal law attending it—the supply is always sure to exceed the demand. The only good times for the brickmaker have been when from exceptional causes a temporary suspension of this rule has resulted. As a rule, if there is a market for a million bricks in a locality, two million will be made, thus enabling the buyer practically to set the price on them. This is a fact which can be verified by an inquiry into the condition of the business at any point from Maine to Texas.

As a late writer in the Clay-Worker pertinently remarked, lowering the price never increases the consumption, and there would be just as many bricks used at eight dollars per thousand as at four. The custom in Maine, as I judge it is elsewhere, is to rattle off as many as possible, with little regard to quality, sell a little cheaper than anybody else, and keep doing so until starvation or insolvency compels suspension, when somebody else will take it up and go through the same operation. The contractor, in this condition of things, can take work at a lower price, the builder can rent his building cheaper, the trader can sell his goods at a smaller profit, which the brickyard laborer can buy at a price which will enable him to make some more cheap bricks; but where the ultimate benefit to the community from the system comes in I will leave to some one better versed in the science of political economy than I am to decide.

MUDLARK.

AN UP-TO-DATE BRICKMAKER.

IF I REMEMBER aright there is an old adage which states that some men are born great; that some achieve greatness, and that some have greatness thrust upon them. A similar and appropriate adage might be uttered of certain individuals as saying that they were born to success; that they achieved success, and that success was wished them by every one with whom they came in contact, and to no man could these latter remarks more appropriately apply than to Mr. William G. Titcomb, of Barrington, R. I., and whose portrait we have the honor to reproduce in the columns of the Clay-Worker.

While wealth does not make the man, it certainly helps to broaden his powers and influence; and if some men are fortunate in having a millionaire ancestor to whom they are heir, Mr. Titcomb is doubly fortunate in having both his own father and the father of his accomplished wife, possessors of that amount of money.

If other men have been lucky enough after experiencing



WILLIAM GRAVES TITCOMB, Barrington, R. I.

years of the ordinary vicissitudes of business, at last to win success, Mr. Titcomb can truly say that each step in his business career has been forward and that he has yet to make one that is backward.

First as Treasurer and then as President of The New England Steam Brick Co., he has seen it grow from a concern with a capacity for a few thousand brick per day to one of the present time, which has an annual capacity of over fifty million. What much better illustrates the advancement of the business of which he is the head, is the fact that when he first became connected with the works, there were made on the yard only the commonest of building bricks, and having only a local market, while now there are produced the best of sewer brick; the hardest of paving brick and as fine a face brick as can be found anywhere, and which are being shipped to all parts of New England. Like many other men of ability and wealth Mr. Titcomb has not remained content with wrestling success from one line of business, but has lately become interested in the erection of a large brewery in the city of Boston, which

business it is almost certain will grow to large proportions while in his control.

If to a man's ability you can add wealth; if with his wealth he has generosity of nature; and if with generosity of nature you can add geniality of soul, he comes near possessing all the requirements necessary to make him the most desirable of friends and a prince of good fellows.

If any member of the N. B. M. A. has ever held doubts of Mr. Titcomb's possessing the attributes of a man as above described, let him come to New England and remain a few hours where Mr. Titcomb can let the overflow of his good nature come about him, and the downward flow of the good things of New England get within him, and we think he will go away fully convinced that the N. B. M. A. ought by all means accept the invitation of the Bostonians and hold a convention at the Hub, for there are several other brickmakers

to as china clay. This use of the term may not be justified mineralogically or linguistically, but since it has become established in the trade it is better to refer to the finished product as "china clay" and not as "kaolin," which of course leads to more or less confusion.—Exchange.

Written for the CLAY-WORKER.

MODERN TERRA COTTA CONSTRUCTION—HOW GOOD WORK IS MARRED SOMETIMES.

AFTER THE ARCHITECT has designed and developed his ideal, and the terra cotta maker has faithfully and well performed his part, and has produced the required material in an available and permanent form, there follows another process, which if improperly done, may mar or even destroy the artistic value of the terra cotta work.



THE YALE GYMNASIUM BUILDING, New Haven, Conn.

there of the same sort—jolly good fellows every one, who would make it very interesting for the visiting members of the ancient art of brickmaking.

UNCLE JONATHAN.

"KAOLIN" OR "CHINA CLAY."

There is a good deal of confusion in the use of the terms "kaolin" and "china clay," which are often employed in technical publications as if they were interchangeable. Kaolin is mineralogically a simple hydrous silicate of aluminum, which is indeed practically the composition of china clay. Kaolin is seldom found pure, however, and it is usually necessary to subject it to some kind of mechanical treatment to free it from the impurities which would be objectionable in pottery making, for which purpose by far the greater part of the production is employed. In the principal American deposits the yield of the clean material is only about 32 per cent. of that which is dug. In the industry the term *china clay* is used to designate the crude material, while the first product is called *kaolin*.

That important process is the setting of the terra cotta in its final position in the building. How to do this correctly is a very extensive subject, so in this article we will only consider one section of it, viz.: The pointing of the joints of terra cotta.

This is the last operation in the setting of terra cotta, but it is often (unfortunately) the one which first attracts the eye of the general observer, therefore it should be carefully and skillfully done in order to make a good presentation of all the other details of the terra cotta maker's workmanship.

Right here is the place to say that the terra cotta maker should not relax his watchfulness over his work until it is set in its place; he should aid the builder by his knowledge in doing what is necessary, for upon this will in a great measure rest the character of his work finally.

We have selected the Yale gymnasium building at New Haven, Conn., as an illustration of this matter, and have gone over and carefully examined it in order to be exact, so that we might help all clayworkers who may be confronted with this difficulty.

If the reader will carefully examine the four semi-circular panels over the second-story windows in this illustration, he will observe that they represent four popular modern sports (not "Grecian sports"). Beginning at the left hand we find base ball, next dumb-bells and Indian clubs, then rowing and lastly foot-ball.

We are indebted to the courtesy of Mr. Walter Geer, President of the New York Architectural Terra Cotta Company (who made these terra cotta panels), for the photographs from which these illustrations are made to illustrate this subject.

The plate of the panel shown is the one to which we wish to draw special attention. It represents the work at the exact point where the terra cotta maker's operations terminate. It has been modelled, moulded, dried, burned, and finally fitted and joined together ready for delivery at the building to be set in place.

All well regulated terra cotta works make photographs at this stage of their work, because it provides a proof that the work is complete, correctly fitted, and capable of being set in

avoided? First, the defaced panels were probably pointed by a careless workman (perhaps color blind), who may have used the white bedding mortar for the pointing of his work, and who also paid no regard to the irregular surfaces made by the sculptor for effect upon the background of the panels. Second, he made his joints long, straight and smooth surfaces, which refract the light more than a roughened surface, and therefore make the joints appear much whiter than they really are, when seen at closer range than from the ground or street.

The workman who pointed the rowing and the foot-ball panels knew better. He was an artisan. He had an eye for form and color, and made use of it. He saw and recognized the sculptor's treatment of the surface of the terra cotta, and with a skillful hand imitated it upon the surface of his joints. Thus the unity of intent between the sculptor and the workman produced the uniformity which made the work of both a success and a monument of good workmanship. From this we conclude that there are two requisites to insure good work in setting terra cotta: First, a proper material; second, an intel-



TYMPANUM, in Facade of New Gymnasium, Yale College

place in such a manner as to be a good job if the setting is done by skillful workmen and properly pointed.

This plate shows the several separate pieces fitted and set together in their relative places, without any mortar, wedges of wood being used to regulate the thickness of the mortar joints, which have been provided for in the fitting.

When it is considered that these panels are fourteen feet on the base line or diameter, it will be seen that the joints are not very large or conspicuous, even without any pointing. All of these four panels were fitted in like manner and with equally good results.

If we look back to the general view of the building, beginning at the right-hand or football panel, it will be seen that the joints are almost invisible; certainly they do not obtrude upon one's attention. The next, or the rowing panel, is also an example of good setting and skillful pointing of joints.

But when we look at the dumb-bell and Indian club panel, we find that the joints are so obtrusive as to in a measure detract from the effect of the sculptor's design, and the last or base-ball panel is nearly as bad. Why is there this difference? It was no fault of the terra cotta maker. Our illustration shows that the work did fit and could have been set as well as any of the others. The fault is entirely and only due to the imperfect pointing of the joints. How can this fault be

ligent and skilled workman. The selection of the latter belongs to the builder. We can help provide the former.

Terra Cotta, of whatever color, should have the joints pointed with a mortar made of terra cotta dust, lime mortar, and enough Portland cement to make it set (say about one-sixth in bulk). The terra cotta dust must, of course, be of same color as the terra cotta work. It will be furnished freely by the terra cotta maker (if not actually offered by him). The lime mortar gives it bond, and the Portland cement gives it hardness. The terra cotta dust gives it color. Experience derived from long practice has taught us that if the terra cotta maker would have his work properly set, and a credit to his works, he must co-operate with the builder and aid him voluntarily until the building is completed. His legal responsibility may end with the safe delivery at the building, but his actual responsibility will not cease until he has retired from the business of selling terra cotta.

JAMES TAYLOR.

BRICK EFFLORESCENCE.

Professor Gunther, in a recent address at the University of Rostock, Germany, said that brick efflorescence or incrustation could be prevented by long exposure of the clay, by adding barium salts before burning, or, in continuous kilns, by preventing the oxydization of sulphur by limiting the air supply.

Written for the CLAY-WORKER.

HISTORICAL SKETCH OF THE PHOENIXVILLE (PA.) POTTERY. Second Paper.

BY EDWIN ATLEE BARBER.



ON MAY 20th, 1880, Mr. William Hill withdrew from the firm of Griffen, Smith & Hill, after which date the firm became Griffen, Smith & Co. Until about 1882 the principal product of the pottery was C. C. ware, but experiments had been made in so-called Majolica ware, which was, in reality, a good grade of the same body covered with colored glazes. For some years this variety of pottery was extensively manufactured here, under the name of "Etruscan Majolica," and this was of such excellent quality and modeling, in its class, that through its introduction the establishment soon became widely known throughout the Eastern States. At no other pottery in the Union was similar ware made of such merit, either in composition, glaze, modeling or coloring. Many of the designs were prepared by an English artist of the name of Bourne, and among them we can detect a remarkable resemblance to the Irish "Belleek" forms, marine animals, shells, corals and algae being lavishly employed as decorative motives. To carry the resemblance still further, the Phoenixville majolica was frequently quite thin, and was often lined with tinted, pearly glazes which characterize the real Belleek porcelains. Yet these points of similarity are claimed to have been entirely accidental. The illustrated catalogue of these majolica patterns shows an abundance of shapes and designs, such as entire tea sets, flower pots, cuspidors, fancy

plates with raised or etched designs, jugs, baskets, mugs, vases, jewel trays, sardine boxes, covered cheese dishes, paper weights, jars and numerous other objects, ornamental and useful. Leaf-shaped plates and dishes, for pickles, olives, pin trays and what not were produced in an abundance of shapes and sizes, modeled and colored after nature.

Among the plates were many incised outline designs of classical subjects, animals, birds and a series of simple drawings illustrating the story of Rip Van Winkle, done by W. H. Edge,



BALL GAME PITCHER, (Majolica) Phoenixville Pottery.

illustrating the story of Rip Van Winkle, done by W. H. Edge, a decorator who was at one time connected with the establishment. The green, flesh-colored, terra-cotta and yellow glazes are particularly good on these table plates.

Among the more pretentious designs in majolica are some comports or fruit stands supported on stems that have been modeled in the form of three intertwining dolphins. Among table furnishings some salad or ice cream patterns with shell and coral decorations—pink and cream-colored, are particularly dainty and pleasing in this class of ware. A series of special designs for majolica and porcelain were prepared for the New Orleans Exhibition, among which were a jug and a vase with body in the shape of a revolutionary canteen, bearing on the sides the raised representation of the arms of the United States, the lip of the jug being formed of the head and three-cornered hat of a Continental soldier. A jug with raised figures, representing foot ball and base ball players, was also produced in this so-called majolica body, and the same moulds were used in the production of thin porcelain pieces, an example of which may be seen in the collection of the Pennsylvania Museum, Philadelphia, which possesses a solid pink ground and white figures.

The majolica ware of the Phoenixville pottery bears the stamp of the monogram, G. S. H. (Griffen, Smith & Hill. Sometimes these letters are used alone, though usually they occur in the center of a circle surrounded by the words "ETRUSCAN MAJOLICA."

As early as 1882 experiments were begun in the manufacture of white granite, semi-porcelain and hard porcelain, and for about eight years a large line of decorated goods were made in table and toilet services. Mr. David Smith withdrew from the firm on May 22, 1889, when Mr. J. Stewart Love was admitted, the firm name becoming Griffen, Love & Co.

A portion of the pottery buildings were destroyed by fire on December 3, 1890, and the pottery was closed for a time, but on April 7, 1891, a reorganization was effected, under the title of the Griffen China Co., all creditors of the company becoming stockholders.

In 1886 the business of the establishment had grown to such proportions that fifty decorators were employed, twenty of whom were engaged in decorating majolica ware. Among the better known artists who modeled and painted here about this time was Mr. Thomas Scott Callowhill, now of Trenton, N. J., and at one time connected with the Worcester Royal Porcelain Works, and the Doulton Works at Burslem, England.

Between the years 1877 and 1891 a considerable variety of wares was produced experimentally, such as bone (soft) china, true hard porcelain, and jet ware, the latter being characterized by a brilliant black glaze with gold decorations, several examples of which are still preserved, notably a tea set owned by Mr. Henry R. Griffen. Among other curiosities of this pottery that are still preserved are a large parisian jug with raised design of the American eagle, and one of the ball-game jugs, in English bisque or bone china, bodily stained with cobalt blue, which, by reason of having too much of the color in



PIN TRAY, (Majolica) Phoenixville Pottery.



CHEESE DISH, (Majolica) Phoenixville Pottery.

the clay, shows a slightly bluish tint by reflected light and a brilliant rose tint by transmitted light.

The Griffen China Co. operated the plant for only a short time; the factory was closed in 1892 and so remained until 1894. On June 1st of that year a limited partnership was formed by Messrs. E. L. Buckwalter and H. I. Brownback,

styled the Chester Pottery Co. of Pennsylvania, the plant being leased by them for five years from that date. All of the operators from the beginning have been lessees from the original company.

The present manager of the works is Mr. V. Shaffer Yarnall.



POTTERY STAMPS FOR MARKING MAJOLICA WARE.
Phoenixville Pottery.

The products of the pottery under the recent management are "block stamped semi-granite ware," plain white and decorated; also colored glazed ware in nine colors, in toilet, table and other useful articles.

Among the later productions of this establishment are pitchers and plates bearing printed portraits of McKinley and Hobart, made for the presidential campaign of the autumn of 1896. These were printed both over and under the glaze. The pottery is making progress in the manufacture of commercial wares, but, at present, little of an artistic nature is being attempted.

I have been thus explicit in describing the various products of the Phoenixville works in order to place on record the various steps of development of one of the most important potteries in the State of Pennsylvania. Let us hope that these published historical facts may derive greater value and importance hereafter, by reason of constant improvement in the artistic, as well as the commercial qualities of the wares that may originate here. When the reputation of a pottery has become firmly established for the artistic excellence and originality of its fabrications, its early history becomes a matter of general interest.

Written for the CLAY-WORKER.

RELIABLE INFORMATION.



UNDER THE ABOVE title Brother Waplington in the August number of the Clay-Worker gives some interesting information on various topics. I always endeavor to follow this able writer wherever he goeth. Sometimes, however, when he launches out into the deep to sound the pathless depths of chemistry, I am compelled to tarry near shore and patiently await his return to the regions of practical thought. Then I gladly accompany him until he again sails beyond my depth. Bro. Waplington is not at fault; the trouble is all with me.

"Little boats must keep near shore,
Large ships may venture more."

Referring to my article on fire proof construction in April and May numbers of the Clay-Worker, readers are warned "not to base conclusions on the structures laid on the subject by the writer," as my point of view was almost wholly from the brick yard, and biased by self interest. My point of view for nearly thirty years has been from the brick yard, regardless of what I may be viewing. What little I have seen has been from the brick yard, therefore I must admit the truth of his assertion.

It is hardly necessary to add that I do not claim to be an expert or scientific builder. In these articles I have laid down some truths that will bear inspection. The standpoint of the

writer has nothing to do with undisputed facts. I would be pleased to have Bro. Waplington discuss the propositions set forth in these articles and refute any errors that may appear in them; then the reader can decide for himself. I wrote those articles as I write all the others—from the brickmaker's standpoint. Let the architectural iron and steel manufacturers take care of their interests. I have not the time, even if I had the ability and inclination, to view this subject from their standpoint, and offer arguments to prove that steel construction was better than clay construction. Those fire proof steel buildings in Pittsburg went down before the fire king. There was sufficient combustible material within the walls to expand the steel frame and wreck the building.

I still hold that a brick wall outside, of proper thickness, and all partition walls of brick, will withstand heat that will destroy a steel frame structure. If that be biased, make the most of it. Bro. Waplington volunteers the opinion that the writer will be endorsed by 99 per cent. of the brickmakers through sympathy of interests. If this be true, I am perfectly satisfied. That is as good endorsement as I could possibly wish.

Now, if my distinguished friend can tell us just where we can look for the reliable information he refers to, he will confer a great favor. I judge from what he says of future punishment, he does not consider the Bible reliable authority. His view of that subject is a comforting one for brickmakers, and I have no doubt he would be indorsed in this view by a large majority of brickmakers, provided they view this like the other fire proof subject, from a standpoint of self interest. When it comes to matters of research, so far as the subject of durable and fire proof structures is concerned, we have the history of forty centuries behind us to prove beyond the shadow of a doubt that brick as a building material is more durable and nearer fire proof than any other. These are established facts, with the stamp of antiquity upon their face. Let the steel builders bring forward their theories and probabilities. We place facts and history against theory and prophecy.

My friend, Oldtimer, refers to an office building on Broadway, N. Y., in course of construction, which when completed will be thirty stories high, the first tier for the foundation being sixty feet below the surface. He says, "What a picnic it would be for brickmakers if all the walls were of brick."



REVOLUTIONARY CANTEN PITCHER, Phoenixville Pottery.

This means much to the brickmaker, and it behooves him to do all he can to get before builders the advantages of brick as a building material. Do this from a brickmaker's standpoint.

That is the only sensible standpoint for a brickmaker, as I see it.

Some say such tall buildings can not be built of brick. Smoke stacks have been built of brick four hundred feet in height. A sufficient foundation and good brick is all that is needed to satisfy New York or Chicago builders. Only last week a ware house took fire. It was a one-story building, its outer walls of brick enclosing a space of about one hundred feet square. It was full of baled hay and straw and other combustible material. The fire burst through the roof and the flames leaped forty feet above the building. A half dozen streams were soon playing on the hissing mass. The flaming billows beat in vain against the brick wall, but rolled back without affecting it. This seething mass of flame was confined within the limits of those invincible burned clay walls that stood between the surrounding buildings and destruction, until the fire was under control. No wall of steel or iron could have withstood that test of fire. I thought as I looked upon this scene, ah, grand old brick walls; what a saving factor



MODELED CAKE STAND MADE IN PORCELAIN AND MAJOLICA, Phoenixville Pottery.—See page 266.

they are when the fire fiend seeks to destroy everything within its reach. There was an explosion, no perceptible expansion. Here fire met a master more powerful even than water.

Now, Bro. Waplington, do not seek a flaw in the armor of the champions of clay construction, but rather cast a javelin at the scaly coat of mail that hides the foe. Brick walls for our houses and brickmakers for brick, at all times.

R. B. MORRISON.

GERMAN NOTES.

THE "KERAMISCHE RUNDSCHAU," in a recent number, discusses the causes of "shivering" of glazes on biscuit bodies. Shivering is the scaling off of glazes from the body. The writer thinks that this phenomenon may be caused:

1. By a too plastic body not containing nonplastic materials like quartz, grog, etc., in sufficient quantities.
2. By a lack of cohesion on the part of the glaze itself. In this case the defect appears in the first stage of the burn. The trouble may be remedied by adding burnt and raw kaolin, boiled dextrin, starch and potash. Better yet is the addition of burnt quartz, clay or any other materials which decrease the shrinkage of the glaze.
3. By the accumulation of fine dust in the pores of the biscuit body. Fine particles of coal may likewise cause the same result, especially if the biscuit is exposed to dense coal smoke for some time. In either case the glaze can not get a firm hold on the body.

4. By too high temperature used in the burning of the biscuit, so that the body is too dense and cannot absorb the glaze deep enough. If the biscuit is burned too hard differences in the co-efficients of expansion between the body and glaze will arise. The body, during the glaze burn, would shrink very little, while the glaze would experience considerable shrinkage. This might be remedied either by adding to the glaze .5 to 1.5 per cent. of good potash, or by burning the biscuit at a proper temperature. The latter way is the better. The body composition might be altered some.

5. By sulphur salts or chlorides, which form a coating between the body and glaze.

6. By a body too rich in quartz or having the latter in too fine a condition. The remedy in this case is, of course, the addition of plastic clay and grog to the body and coarser grinding of the quartz.

A press has been patented for making plates by the dry press process. The machine is a screw press in which the movable upper plunger forces the clay against a bottom plunger, which is stationary during the movement of the former. As soon as the screw plunger has descended as far as it will go, the latter plunger is raised by means of an eccentric, worked by a long lever. The last movement is, of course, very small, but helps to produce a very uniform dense body, which will warp very little.

BUTTON-HOLE TALKS.

"WHAT'S YOUR OPINION of Stevenson's hide?" Coming upon me suddenly as this did as I was sneaking through the hotel corridor, tired and worn with repeated button-hole assaults, this inquiry somewhat startled me, but I braced up and, smiling, weakly answered, that on general principles in these times I would gamble that Stevenson's hide was tough, but apart from that I hardly knew what to think of his hide for I wasn't sure that I knew Stevenson, anyway—where was his yard?

"His yard? Why, man, I mean Stevenson the novelist. Don't you remember his Hyde—Dr. Jekyll and Mr. Hyde. Got it now? Mighty interesting story, too, and just too full of real life, I tell you. Why actual life is just chock full of that kind of thing, only they don't have to take medicine to get it and then it takes more than medicine to get over it. Folks just start in giving way to their 'Hyde' nature and every time it is harder to get back to Dr. Jekyll and easier again to slip back to Hyde. Why, you can see it everywhere and all the time. Boys are slick as grease to other fellow's sisters and crosser than Turks to their own. Girls are just too sweet to last to other girl's brothers and then worry their own into perspiration and profanity. Wives that are altogether too nice and kind to other women's husbands and then go home and scold and hammer at their own husbands until they think Hell can't be much punishment anyway. Husbands that—, well you and I need not tell each other anything about them. The least we say the better on that score, only we know that the husbands do their part of the Dr. Jekyll-Hyde act.

"Sometimes the attacks are not very frequent. Victims will be Jekyll for a long time. Live straight and proper. Good husbands, kind fathers, Sunday-school superintendent, like enough. Then he will take a little slip over to Hyde and dodge back to Jekyll again quick, with a scared sensation and a hurt in his heart, resolving that this will be a lesson to him and that he will never do it again. Bye and bye, however, he drops again to Hyde and the trip is easier, lasts longer and is harder to get back from. So it goes on getting all the time to be more Hyde and less Jekyll until it comes to be all Hyde and no Jekyll, as the tender spot in his conscience which is the missing ingredient in the remedy, disappears. Shun it as you would shun poison or opium; one little lapse may not do so very much harm in itself, but repetition brings misery unutterable."

Having concluded thus, he led me to my room, pushed me in and locked the door, saying he might need me again and would know where to get me.

GATES.

CLAYWORKING IN THE FAR NORTHWEST.

The Newberg (Ore.) Pressed Brick and Terra Cotta Co.

THIS COMPANY was organized in 1892 by Messrs. Jesse and C. J. Edwards, of Newberg, and J. M. Wetherall, of Philadelphia, Pa., as incorporators, and commenced the erection of their plant during the summer of 1892 in the forests of Oregon.

They now have their plant equipped with a four-mold Boyd brick press, six-foot dry pan, with inclined screens, the manufacture of dry pressed brick being their method of brickmaking. A 120-horse-power engine, with two 60-horse-power boilers, supply them with power. They dry their brick in a tunnel drier and burn them in a Flood down-draft kiln of 150,000 capacity, a round draft kiln of 50,000 and a small square kiln of 30,000 capacity. The last two kilns are of their own pattern.

They burn their brick entirely with firwood, which makes a very good fuel. Railroad companies use it on their engines in this section of the country. They burn a light and dark red brick, also buff, white and chocolate. The clay for their buff

experienced in the business, it is always best to keep him.

How many failures have been made all owing to the lack of interest. It is generally the man who is always tired and sitting down instead of looking after the different details of the work who is unsuccessful. Attention must be paid to all the details to insure good brick. The first thing to be looked after is the machinery. See that it is in good order and keep it in that condition and in charge of a good engineer who is competent to run it, but not the kind of an engineer who leaves his engine to inform the boss that the steam is down to forty pounds.

Let us go to the clay bank frequently and see what is going on there. Is not the presence of the foreman required there? Would it not save a valuable horse or forward your work to some degree if he knew just what was going on? From the bank to the pit is where care should be taken in preparing the clay. Then look to the molding of the brick; see that the molds are properly sanded, and the sand is kept clean and plenty of it, the molds clean, the yard kept level and smooth and the brick are dumped square, spitting, edging and backing them so they will dry.

Now to the kiln shed; here is where skill and experience is required more than in any other place on the plant. Care and



WORKS OF THE NEWBERG PRESSED BRICK AND TERRA COTTA CO.

and white they ship about fifty and thirty-five miles, respectively. These clay banks are owned by the company. The clay from which they make their white brick has been used for pottery with success.

The company has both river and railroad transportation, Portland being their principal market, which is about twenty-six miles distant. Since the first year the plant has been owned by Jesse Edwards & Sons, still retaining the company's organization. Prospects for the coming year are better than for several years past, for which necessary preparations are being made.

BRICKYARD EXPERIENCE.

I WILL TRY to interest the readers of the Clay-Worker, and if I fail, will be no further off than the engineer who had an automatic stop valve governor on his engine. His governor belt got slack, dropped the valve and stopped the engine. He turned the throttle off and on to no purpose. He called the yard hands to turn the balance wheel over; still the engine would not start. He then called the foreman to find the trouble. On arrival of the foreman, the engineer made the remark, "Gall darn the thing; it won't go." Brickmakers do not want that kind of an engineer. When you have a foreman who takes an interest in your business and who is not afraid to work after hours in case of necessity and one thoroughly

attention must be taken to produce good results. The brick must be dry before they are set in the kiln; they must be set level and a proper distance apart in the arches. Three on three over two arches gives a free draft and a proper combustion in the kiln. The burning of the brick—it makes no difference how well they are made, if they are not well burned they are no good. All is centered on the good burner; if he turns you out a number one burn it makes you feel cheerful and jolly, like the boy with a new knife, before he cuts his finger.

G. O. WRIGHT.

HIGHER PRICES MEAN BETTER TIMES.

The editor was standing at a grocery counter the other day waiting for a lady to finish her purchases.

"Send me a small sack of that flour," she said.

There were tears in the voice of the grocer as he replied, "I'm very sorry, madam, but flour has risen. I must charge you five cents more than I did last time."

"I'm so glad of that," was her answer. "It seems almost like good times again."

She was, if one could judge by her dress, by no means—probably the wife of a laboring man. But by some means she had gotten it through her head that "dollar wheat" and the price of flour, it puts the machinery of industry to work in a way that raises the price of labor also. We recommend her sentiments to the gentlemen who are figuring out so much calamity from dearer bread.—Exchange.

Written for the CLAY-WORKER.

AN IDYLL(ER) IN TERRA COTTA.



OF THE SUMMER TOURISTS who flock by the thousand from the hot and noisy streets of Chicago to the cool and delightful lake regions of Wisconsin and Northern Illinois, a few days of absolute quiet and rest seem always the first requisite. To eat three meals per diem, and to spend the remainder of the day in the hammock, seems to be the needed tonic for many city-jaded mortals. But, though this state of *dolce, far niente* seems at first to leave nothing to be desired, the returning energies of the typical American soon begin to assert themselves and demand some more active outlet. And then the real pleasures of the vacation begin to be experienced, and regret begins to fill the mind for the days lost in the hammock or over a novel on the hotel porches.

The whole region in question is a veritable park of nature's own modeling. In the language of the geologists, it is a vast "terminal moraine." By this they mean that the surface of the earth has been fashioned and molded by the agency of a vast ice-bed or glacier, which, at a geologically-recent time, has covered this whole district, and as it has retreated northward, has left along its receding margins vast mounds of earth, stores and rock debris gathered from the rugged mountain



ACROSS THE LAKE TO GATES'S FACTORY.

country to the north, and which it drops as strangers and waifs on the smooth and stratified limestones which are the natural surface of this part of the State.

To the eye of anyone, be he only a lover of nature, the lovely swell and wave of this beautiful pastoral district are attractive enough to bring him out from the lazy pleasures of the summer hotel on foot, or a-wheel, or by conveyance, as the case may be. As one roams over the country, meeting everywhere comfortable farms, great dairies with their herds of contented cattle, fields rippling with the ripening crops, the look of prosperity and fertile beauty is enough to justify all the hours spent in drinking it in. But how much more delight it means if one can picture in every hill and valley and stunted boulder of black and fire-seamed rock the frowning city of a past which has made this present smiling beauty possible. Or one may give his imagination play in tracing the ice and branches of those great tongues of stone-laden ice which filled our valleys, and whose margins made the smooth, level gravel hills of to-day. It is hard to imagine at first that Northern Illinois has but lately rivaled the climatic severity of the Klondike, but such is surely the case.

On a quiet and sequestered road, leading from Fox Lake Chicago-wards, many tourists, as they dip down a sharp decline and round a corner of the road, come all at once upon a scene which offers a novel contrast to the farmyards and dairies one naturally expects to see.

Nothing less than a large and well-ordered factory, full of busy workmen, and surrounded with kilns and offices, and surmounted by "Old Glory" waving in the breeze, meets the



THE BANKS OF THE FOX RIVER--MORaine HILLS IN THE DISTANCE.

surprised gaze of the passer-by; and many a one, still under the effects of this unexpected reminder of busy city life, has alighted to inquire what it is and how it came there.

Many of these travelers, the unfailing courtesy and the careful explanations of the superintendent and his assistants have still left but little enlightened, though greatly pleased. But to the readers of the Clay-Worker nothing that would be said by these gentlemen would fall unappreciated, for this factory is none other than the American Terra Cotta and Ceramic Company, and its head is none other than our own genial Gates, he of the dress suit and laughing eye, who



"WHOSE PLACID WATERS ARE FRAMED BY WILLOWS AND RUSHES."

makes fun of us and for us, and tries to convince us that it is we who are funny, in one and the same breath.

A residence of two months in this delightful vicinity, and

an almost daily visit to the plant, have left me so far from exhausting its pleasures that I cannot forbear trying to give some faint idea of how it has impressed me.

The first question which a tourist or one of the readers of the Clay-Worker would want to ask on entering the plant is, "Why has this location been chosen, away from the city and off from the railroad line, tucked in out of sight and sound among the moraines and lakelets and dairy farms?" And the answer comes readily enough. Those same glaciers which so beautifully modeled the hills, with the gravel and boulder-covered slopes, also fashioned the valleys as by a plow, scooping out great furrows in the original earth and cutting their way down

First, a brickyard; then a drain-tile factory, whose machinery was driven by water-power. And then the first terra cotta plant, whose destruction by fire only presaged, Phoenix-like, the rising of the new and present structure from its ashes.

Some one has said, "All industries ought to start small and grow by their own natural inertia." If this is so, then this plant is well anchored and established.

And now, while the original clay which first attracted attention, and which brought the first success to the infant industry, has become but one of the many clays which present conditions require, still the factory goes on growing around this nucleus, and increasing in its facilities and its power to



INTERIOR VIEWS OF THE WORKS OF THE AMERICAN TERRA COTTA AND CERAMIC CO.

to bed rock, which they left smoothed and polished as by a giant planer or grindstone. And in these valleys and excavations the floods have filled in the finer, softer sediments, little by little, until we now have great beds of rich alluvial clays and beds of clean, pure sand. And in one of these alluvial beds, in response to currents now gone and in lakelets now vanished, a bed of clay was then laid down which attracted the eye of Mr. Gates as one day he wandered over his fields (this was when he was a farmer). He took a sample of this clay and fashioned it in his own way into a vase, and burned it in an improvised kiln, and to the success of this first crude test all that follows must be ascribed.

It is the old story. By slow steps the industry has grown.

minister to the demands of the "rapacious" architect.

The modern terra cotta maker represents the highest phase of the constructive clayworker, just as the art-potter represents the summit in the other great branch of the ceramic art. He must be able to "be all things to all architects." In other words, he must be quick to catch the idea, resolute to overcome the difficulties that arise in its execution, and absolutely unable to admit that the finished ware is anything but just what the architect needs to make his work acceptable to the owner. He must be able to make constructive clay ware of any size, any shape and any color, and any kind of a surface. He must copy any clayware or natural stone which may be sent in as a sample with sufficient fidelity to deceive anyone at

a few paces distance. These are some of the demands which he must meet.

These demands cannot be met except by the united effort of a good many men with a wide range of knowledge. There

must be draftsmen, artists, chemists, mold-makers, decorators and fitters, besides all of the various departments which belong to the preparation, pressing, drying and burning of the clay. And, above all, there must be the master mind, always active, striving to use and assimilate and direct the energies and knowledge of all of these various specialists.

To properly house and equip so many separate and distinct lines of work is no small matter, as a glance at the accompanying views will readily prepare one to admit. The plaster shop is always one of the most fascinating spots to the visitor. Here one sees a great room, studded with rows of white tables, each of which is a slab of pure white marble, dressed as true as a hair, square on corners and edges, and plane on top. They cost a pretty penny, no doubt, but no other satisfactory material could be substituted for them at less cost, nevertheless. The walls of the room are white, the ceiling is white, the floor is white, and the workmen themselves are in white overalls and clothes. The place is a symphony in white, so to speak. In the corners and unoccupied niches of the room stand old models of especially difficult and beautiful pieces which have long since been executed in clay and are now gracing some stately building. On the tables there are models and molds in all stages of completion, over which the workers are bending, busily engaged.

Just now, on the floor may be seen the models of two giant vases, the molds for which have been made, and which are now nearing completion in clay in the other part of the establishment.

Above the plaster shop is the roomy and well-lighted loft in which the artist and modeler reigns supreme. Now, you can cramp men's bodies in dark, forbidding surroundings if you will, and still exact from their muscles a fair share of work. But where the service which you buy from them is the product of their minds and artistic feelings, their exterior circumstances become of the greatest importance. The modeler's room at Terra Cotta overlooks on one side a lovely little lake, whose placid waters are framed in willows and rushes and covered with lily pads. On the other a wooded, park-like slope, covered from spring till fall with the flowers of the season, stretches away to the west. If he lacks inspiration for a difficult design, two minutes' walk will put him in the heart of nature, out of sight or sound of men, where he can drink in beauty and refresh his mind.

Connecting with this building by bridges on both floors is the main building or press shop. Three great floors are filled with the pressers' and finishers' benches, and the floors are covered with the newly made wares in all stages of drying. Beyond, again, is the dry house, where every day a crop of dry ware is removed from the coils and is replaced by the fresh stock from the press house. Beyond this to the slipping room, where the finely finished surface is prepared for its fiery baptism.

Surrounding the factory on three sides are located the kilns, which are set and drawn from elevated platforms and runways, all covered, and with storage at convenient intervals for kiln slabs, wicket brick, mortar, and all the numberless odds and ends that the burner and kiln crew need. The kilns are all muffle kilns, and are all fired by oil, sprayed either by steam or air, as the case may demand. Connecting with the kiln platform, and on a level with it, is the fitting room, a roomy, single-story structure, in which the ware is placed direct from the kilns, and in which it is inspected, laid out and measured, chipped and ground and made perfect in every respect.

No better proof of the excellence of the ware is needed than to see the fitters at work on a piece of ware which has to be reduced in size. They pound and chisel and cut it with the same freedom that they would sandstone, and it rings like a great bell under the vibration of their blows. The burning seems to be excellent, there being but little variation from top to bottom of the kilns and in the color of the output.



THE POTTERY DEPARTMENT OF "GATES'S" WORKS. THE CHEMIST AND HIS "DEN." THE "TALENT" AT TERRA COTTA.

It cannot but affect a clayworker with surprise to go into a kiln which is in process of drawing and to see the variety of colors which are burnt side by side,—red, buff, grays of all tints, browns, whites, even glazed wares and enameled wares, side by side with the others. It gives a shock to one who is used to thinking that every clay demands its own special conditions, and that a glaze is a sacred thing not to be handled except by the initiated and with fear and trembling.

How can these things be, you ask? Very easily, when you know how. The whole technical side of the business is under chemical control. The problems, when seen from the outside, seem insuperable; when viewed from the inside, they are simplified most amazingly. The body mixtures are those which long experience has demonstrated are a satisfactory basis for producing a wide range of effects. Substantially, they are a red body and a buff body which perfect themselves at the same heat, and which shrink alike. On this, as a foundation, every effect is produced by the use of clay slips, which are colored in any way to suit the requirements of the case. Sometimes the body itself is tinted to assist in the production of some elusive effect which cannot be gotten by merely surface treatment. Sometimes two or more slips are used to imitate the blending of colors of some coarse-grained granite rock.



A GLAZED VASE SEVEN FEET HIGH.

All of these colored slips must be made to mature at the same heat as the body on which they are used, of course.

Similarly, the glazes must be always adjusted so that they will mature when the rest of the ware is perfect. No one kind of ware is allowed to require a temperature or kiln treatment different from the rest. Hence, any sudden order to replace some broken piece, or some extra which comes in late, can always find a place in the first kiln set, and that without risk of damage to its appearance.

From what has been said, it will be plain that the technical features of this plant are by no means small, and that they require some one to cope with them who knows the principles of chemistry, as well as the working of clay. And it is with pardonable pride that I call attention to the fact that the present incumbent of this position, Mr. E. E. Gorton, got his training at the Department of Ceramics of the Ohio State University, and that, with no other training whatever, he has taken hold of this position and filled it to the entire satisfaction of the company from the first. In the accompanying view Mr.

Gorton may be seen in his laboratory. He does not look very pretty; overalls and whitewashed shoes are the daily program with him. But he is too busy and too interested in his work to think of exteriors; he puts his thought on the decoration of the wares, not himself.

It is plain that a factory which is capable of turning out such various wares as I have hastily described is capable of doing more if it wishes. And, under Mr. Gates's management, one successful attempt always leads to another. Just now, the entire force is agog with excitement over the production of the two mammoth vases mentioned before. To produce a vase seven feet high and weighing a thousand pounds, glazed and decorated, in one burn, and in a kiln filled with terra cotta, is a feat which a potter would hardly like to try. But such an event is now in process at Terra Cotta.

One could continue almost indefinitely to describe features of interest and novelty in this interesting plant. It is to a large extent a spontaneous growth. Sequestered among the hills and valleys of a dairy district, it has developed along original lines and in ways which the typical city plant could hardly emulate. Far from following the conventional lines, it has worked upward and forward in its own way, and its product bears the stamp of evolution.

Originality and fearless attack of technical obstacles have constantly characterized the labors of all who have built up this industry. Without these faculties, the life of the terra cotta maker would be a burden. With them, even when backed up by technical training, friend Gates says life is not always a happy dream.

EDWARD ORTON, JR.

IN THE LAND OF PROMISE.

It is not for nations to command prosperity; but we have done more—we have deserved it. We have prepared ourselves to take advantage of it, and our foresight is having its reward. Prosperity is here. "One swallow does not make a summer," but many swallows are a proof that summer is come. The arrival of prosperity is marked by many infallible signs. The channels of business are no longer dry; the volume of business has increased and is increasing; the railroads have more business; freight trains are heavier, they run oftener, and there are more of them. The freight earnings have been largely increased. This is an infallible sign of the return of prosperity. Increased freight means increased trade, and increased trade means prosperity.

Banks are not in politics—they are in business; and when their returns show greater clearings, we have witnesses that will not lie that prosperity is here! The farmer is prosperous, and with his prosperity the nation prospers. Agriculture is the foundation of the nation's wealth, and no prosperity is solid or enduring which does not include the farmer. Wheat has touched, at least for an hour, the magic dollar mark. The dreams of years have thus been realized; the long heart-breaking burden of the mortgage is being lifted; farming districts are overflowing with money. The calamity howler has no material with which to work; confidence has been restored, and for a time we shall hear the croaker no more. The silverite and populist may go out of business. Prosperity certainly does not prosper their cause.

Prosperity is never forced upon a nation, and can not grow where the roots of uncertainty are. It is true that the procession of the seasons and the fruitfulness of the soil are not affected by any political policy. It was not our doing which caused the crops in Europe to fail. It was not our doing that blessed the broad harvest fields of America. But it was our doing that we were able to take advantage when opportunity offered, and that business confidence was restored by the passage of certain bills. It was our doing that the long night of business uncertainty and exposure to unscrupulous competition came to an end. National prosperity is the best measure of currency reform; it stops the "endless chain."—Power and Transmission.

BUCKEYE PLANTS—A GREAT SEWER PIPE AND FIRE PROOFING MANUFACTORY.



THIRTEEN MILES south of Akron, on the line of the Cleveland Terminal & Valley Railway, is a quiet little village called Greentown, the birthplace of Cornelius Aultman and Lewis Miller, of mower and reaper fame, and of many other men who have built from a small beginning most successful business careers. While in early life most of these men left the home of their childhood to engage in business elsewhere, others have since invested thousands of dollars in that place. The American Cereal Company own and operate a large grain elevator there, where thousands of bushels of grain is bought and finds its way through the regular channels to the markets of the world.

Several years ago Mr. Horace B. Camp, an old and experienced manufacturer of clay products, appreciating the fact that there was at this place an unbounded supply of rich clay deposits, purchased a parcel of land containing about thirteen acres and located just south of Greentown station and on the east side of the "Valley" tracks. The H. B. Camp Company was at once organized, with Mr. H. B. Camp President and General Manager and Mr. William H. Weaver Secretary and Treasurer. The company leased 180 acres of land adjoining their own, from which their clay is mined. A modern and commodious plant was erected, which at the time they supposed would satisfy the demands of their business for some years to come. Contrary to their expectations, it was but a little while till they found themselves handicapped and crowded for room, and as a result a second plant was built, larger than the first, and to-day there stands on this place two separate and distinct shops, which we will hereafter designate as the "old shop" and the "new shop," the product of each consisting of sewer pipe, hollow building blocks, fireproofing and vitrified interior conduiting.

The two shops are located about six hundred feet apart, and are both constructed of hollow building blocks of the company's manufacture. The "old shop" is run by a Hamilton Corliss engine of 250 horse-power, fed by a 250 horse-power Stirling boiler manufactured by the company of that name of Barberton, Ohio. Here the clay comes from a deep closed mine, probably three hundred feet from the works, and which

being loaded with clay, are conveyed up an incline direct to the shop by a winding drum propelled by steam. From here the clay goes to the dry pans, three in number, and from them it is conveyed by elevators to the third floor, where it enters a tempering drum or mixing machine constructed by Mr. Camp



AT THE CLAY BANK, H. B. Camp & Co., Akron, Ohio.

himself. From here it is carried to the first floor again, direct to the presses, one a horizontal and the other a vertical, the latter of the Turner, Vaughn & Taylor make at Cuyahoga Falls, Ohio. Emerging from the press, molded into all conceivable sizes and shapes, it is placed on cars and carried to the dryers, which are located on all of the four stories of the building, and together contain fifty-six tracks, each one hundred feet long and capable of holding sixteen cars each. After the drying process is completed the ware is then ready for the kilns, where it goes through the regular process of burning, after which it is put on the market.

At the "new shop" the clay comes from an "open mine," and is hauled some three or four hundred feet by horses to the door of the works, where it is unloaded and carried to the basement direct to the dry pan, a large one, manufactured by the Frey-Sheckler Company, of Bucyrus. From here it is elevated fifty feet to the extreme top of the building, where it runs over an inclined and revolving screen, set on an angle of forty-five degrees, thence into hoppers and to the floors below. Here again are to be found two tempering drums, which have a daily capacity of eighty tons of clay. From here the clay goes to the press as in the old shop. The drying system here is somewhat different from that in the "old shop." It consists of over 22,000 feet of one-inch steam pipes into which during the day all exhaust steam is turned, and into which at night all steam from the boilers finds its way through. There is also a 120-inch Buffalo forge fan, run by a 12 horse-power engine. This causes the warm air to circulate, and makes an even temperature throughout the dryer. This shop is run by a 125 horse-power high-speed engine and a J. C. McNeil Company vertical boiler of 200 horse-power. Eighteen boilers are almost constantly kept burning to get the output of these two shops ready for the market.

Altogether 125 men are employed at reasonable wages. During August the company shipped on an average of from thirteen to fifteen carloads of fireproofing and interior conduiting a day.

The coal strike had little if any effect on this plant, as they



A PORTION OF THE WORKS AND WORKMEN OF THE H. B. CAMP & Co.

is probably fifty feet below the surface of the ground. In this mine there are numerous rooms, one being about eighty feet from the entrance of the mine, another over two hundred feet. From these rooms three others branch off in different directions. Into these different rooms the cars are run, and, after

had access to the mine of Smith Brothers, but a few feet from their own property, where they procured all coal necessary to keep them running.

The company operate, in connection with their plant, their own machine, carpenter and blacksmith shops, where they build all their own cars, sharpen tools, and do all the repair work incident to their business.

Aside from the Greentown plant, the Camp Company own and operate a plant at Shreve, Ohio, on the Pittsburg, Fort Wayne & Chicago Railroad, where thirty men are kept busy making fireproofing and building brick.

BOHEMIAN.

THE REVIVAL OF THE POTTER'S ART.

BY WILLIAM D. GATES.



FROM REMOTEST TIMES, among all nations and in the uttermost parts of the earth, the subject of ceramics has been of vital importance. Artistic triumphs of the potter come fresh to-day to the home of the millionaire, while the student of the past finds in the broken fragments of pottery all that is left to tell of the nations that have passed into oblivion.

First the necessity of some food receptacle that would stand extremes of temperature, and then one that could be easily and effectually cleaned, led to progress in the art from the first and crudest ware manufactured, up to the artistic triumphs of to-day. From time to time, or more properly all the time, improvements in quality, and taste as well, have been made. The desire for beauty has found in the pottery a field nowhere surpassed in breadth of scope or in richness of opportunity.

In remote corners of the globe men were laboring in the same line, knowing nothing of each other's existence or of each other's efforts, and yet finding out the same principles. Unknown one to another they wrought their wares on identical

beautiful curves, which are recognized among all nations as standards of artistic shape.

In France, in England, and notably in China, they found excellence not only in shape, but in texture, body and glaze as well. They brought, also, artistic effort into the field of decoration, until the work that has been wrought by men whose bones have long since crumbled, is to-day cherished and treasured by cultured people, who, in it, see the artistic soul of its maker.

Through all these times this effort was in a very great measure individual. Each was dependent on himself alone. When his life came to a close he might give his knowledge, in a measure only, to his son or successor, who, the same conditions continuing, might successfully manufacture, but who was very likely to fail whenever the conditions changed, be the change ever so little. Besides, we know how often a competent father is succeeded by an incompetent son and how easily this would break the chain.

When the crude, soft-burned pottery of the earlier period, had been superseded by vitrified ware, and this in turn by glazed, (thus achieving a maximum of cleanliness and of beauty as well), one might have thought that perfection had been reached, and that no further effort was necessary.

Not so, however, with the true disciples of the art. Their confidence in the future of their art was unbounded. So they went on, these devotees, reaching out and trying, through thousands and thousands of experiments, to improve their ware. Seeking by color and dainty shape, a more perfect body and a better-fitting glaze, or a more artistic handling, to realize or approach their ideal, until one conquest has followed another to the present day. And now more men and abler men than ever before, are working early and late to bring the art still higher.

In this country with its bustle and hurry and amid its wild rush for wealth, we have been inclined to think that these arts of the potter were in a measure "lost" arts, or arts available only in remote countries. Such is not the case. Wide awake Americans have been studying these subjects with a love and



SEWER PIPE AND HOLLOW BLOCK FACTORY OF H. B. CAMP & Co., Greentown, Ohio.

devotion that has never been surpassed by the men who have made the history of ceramics in foreign lands. Not only have these men had this love and a fixed ambition to surpass, but they have brought Yankee energy and ingenuity to bear and have gone on their way irresistibly.

They have, in a great measure, quit reaching out in the dark and feeling blindly for results, as did their predecessors, but have brought science to their aid, so that the progress they have made is progress indeed, for they know why and wherefore for everything they have attained, and can therefore cope with new conditions where their predecessors could not.

To-day, high among the finest clay products of the globe are those of the United States, which, indeed, is necessitated by our severe climatic conditions, as well as the artistic requirements of the people.

Written for the CLAY-WORKER.

THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Fifth Paper.

BY E. G. DURANT.



EXPERIENCES IN ORNAMENTING, coloring and finishing block faces were given in the last paper, and before leaving the details of manufacturing it may be well to refer to some other experiences.

Methods of cutting blocks to length which were at the outset adopted, and which are still largely adhered to, were very crude, and resulted from the fact that no special provisions had been made to improve the character of hollow building blocks beyond the improvements noted in forming dies and ornamenting and finishing rolls.

Experiences in ornamenting, coloring and finishing block faces were given in the last paper, and before leaving the details of manufacturing it may be well to refer to some other experiences.

Methods of cutting blocks to length which were at the outset adopted, and which are still largely adhered to, were very crude, and resulted from the fact that no special provisions had been made to improve the character of hollow building blocks beyond the improvements noted in forming dies and ornamenting and finishing rolls.

Auger machines, devised originally for the production of brick and drain tile, have, without any change being made in them to adapt them to block work, continued to do duty, and the simplest form of cutting table known to the craft, one that is listed by the manufacturers under the name of "combination" table, having bent pipe cutting frame, with collars strung thereon carrying the wires, adjustable and fixed at any desired point, has been and is most largely used to date. This cutting outfit answered very well so long as only simple forms of right angle blocks were made and the character of the ornament applied to them permitted the block to be cut at any point, as in a rock-faced block having no margins. One or two blocks were cut at a stroke, and at each cutting a longer or shorter end of the clay column was cut as waste and thrown back into the hopper of the machine, this waste averaging one-tenth or more of the output.

Just here permit the observation that such and other similar methods of working, common in the manufacture of clay wares, would not be tolerated in other lines of business. It is, perhaps, the outgrowth of two facts: First, that the material is not lost, but is immediately worked over again; second, that few of the men about an ordinary brickmaking or tile manufacturing establishment—as these establishments run—are skilled mechanics, and are without training to insure system or method; but when such wastes are footed up a deduction of not less than 10 per cent. from what might and should have constituted a day's product may be recorded. What other business will bear a 10-per-cent. waste at one point in the process of

manufacture? And yet such waste may be found current in almost every tile and fire-proofing establishment in the country where auger or plunger machines are used.

When it came to manufacturing blocks having a complete design which should enter into the length of a block, and no more or less, and the cutting of which at any point one-eighth of an inch either way would do violence to the design, it will be evident that any waste must mean no less than the waste of a whole block.

But another difficulty appeared. As we have before stated, the ornamenting rolls are, or were, operated by the moving clay mass. These rolls, it was found, when it came to the production of wares having a set figure, dragged on the plastic clay, and imperceptibly the figure was thereby elongated, more or less, depending upon the exact tempering of the clay. This, of course, had been the case in all goods previously manufactured, but was not noticed until it became a serious obstacle in the production of what is to constitute the major portion of the ornamental block product.

Of course, it became necessary to cut blocks singly—that is, with a single wire—and a very skillful hand and eye were found necessary in cutting with accuracy blocks from a moving column, which, when cut, were, even in their best estate, most unsatisfactory to the user. The testimony of a contractor on this point that a good man had been employed, and kept constantly busy, in assorting blocks for two or three who were laying them, in order to save cutting in laying between angles and openings in the wall, indicated the necessity of reform.

In laying brick the unit is so small that any little disparity in the size of the brick is taken up by a thicker or thinner mortar joint, and, when needed to fill out, a broken or chipped brick is easily had. The larger bulk of the block, it must be conceded, demands the same accuracy that is required in cut stone work, and just here it was seen that

—Perfected Machinery,—

Devised and adapted to the special purpose of block manufacture, must be supplied to the manufacturer, or the industry could not be made to assume any importance.

It was found by experiment that power applied directly to the operating of the rolls could be made to overcome the drag of the roll and the consequent elongation of the block, and this, with a ready and sensitive adjustment of the speed, would largely cure the difficulty, but the method of cutting would still remain unsatisfactory, first, for lack of perfect accuracy either in length or in cutting, and, second, because the return of the wire through the cut made tended to leave an imperfect, or, at least, a roughened, edge. Other difficulties also appeared. When two sides of a block were to be ornamented, as a corner block, in consequence of one embossing roll standing vertical it could not be treated with powdered material or color to secure a result uniform with the other face. Again, it was desired to make columns figured or fluted, requiring treatment on all sides, and these could not, of course, be produced on a horizontal machine, and, further, it was found that in practice the travel of heavy blocks on rolls and lifting them from their sides to set on end, even with the best facilities for ending up, had a tendency to injure the perfect form of the block, and occasioned more or less of loss, besides a sensible deterioration of the product generally.

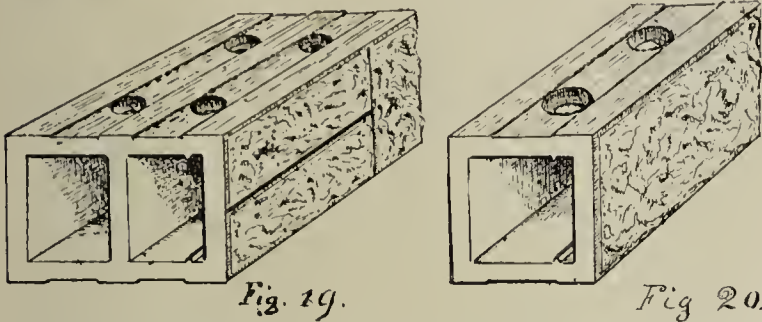
Further, it was desired to incorporate a new feature in block manufacture, both in the interest of economy in production as well as the giving of an added value to the blocks themselves. It was deemed that a block wall should have both

—Horizontal and Vertical Passages,—

And for several reasons: First, as affording still more perfect protection against heat, cold and dampness; second, in the interest of both ventilation and heating, and, third, as facilitating electric wiring and piping for gas or water.

The method of securing such results it was deemed could best be accomplished by cutting openings in the top and bottom of the blocks in such manner that when laid in the wall such

openings should register with each other, making continuous passages from foundation to roof, if desired. It was also decided that two openings should be made in each chamber of a block, equidistant from its longitudinal center, and equidistant from each end, also. Such blocks are shown in the accompanying sketches, 19 and 20.



Incidentally, it was found that such perforations would effect the saving of about four tons of material in a day's work on the double chambered block, and about five tons on the single chambered, the openings being, respectively, $2\frac{1}{2}$ and $3\frac{1}{2}$ inches. It would also be a great convenience to the mason in laying, and would also be of value in bolting on wall plates, and, if desired, in running bolts from foundation to rafters where needed as security against cyclone or earthquake in places where such considerations weigh, as in Kansas, Charleston and San Francisco.

—In Devising a New Machine—

That should in the best manner, while of the simplest form of construction, embody the various improvements referred to, and be easily operated—one from which the product could be the easiest handled, and one requiring the least power—it was decided that a vertical machine was essential to blocks having more than one ornamented face, and desirable because blocks could be delivered in more perfect form, and be handled—especially the larger blocks—with the least labor, and because the weight of the clay and the auger and shaft—aggregating one and a half tons or more—would relieve the machine and lessen the power required to work it. Besides, the automatic perforating and cutting mechanism, as well as the embossing rolls, could be placed over head, where they would not interfere with the handling of the product.

In the cut and description which follow we attempt to make clear to those who may be interested the working of this machine.

—Description of Machine and Its Working.—

Fig. 1. Front elevation.

Fig. 2. Side elevation.

Fig. 3. Plan showing punching, ornamenting and cut-off mechanism.

Fig. 4. Plan of tables for receiving and carrying off blocks.

Fig. 5. Vertical cross-section of dies and rolls.

Fig. 6. Section view of hub of cut-off device.

The mechanism shown is all automatic, except the delivery table, which is shown to be operated by a crank, but which will also be operated by power automatically, so that the party attending the machine may be free from any demands upon his time save that of seeing that each part of the mechanism is in perfect running order to perform its work.

In the drawings "A" is a sectional view of the auger machine, "B" the forming die, "C" the finishing die, "D" the ornamenting roll, "E" perforating mechanism, "F" section of the cut-off bow, "G" receiving table, "H" delivery table, "I" yoke supporting weights, counterbalancing the receiving table.

It will be seen that all the parts except "A" are supported by and adjustable upon the shafts, "J," of which there are four, more plainly seen in Figs. 3 and 4.

In operation the clay is delivered directly from the pug mill into machine, "A," or by elevator from the wet pan, as the case may be.

The starting lever, "F," is in easy reach of the operator. A pile of board pallets, "W," are placed on the delivery table, "H,"

and in the outset one is also placed on the receiving table, "G."

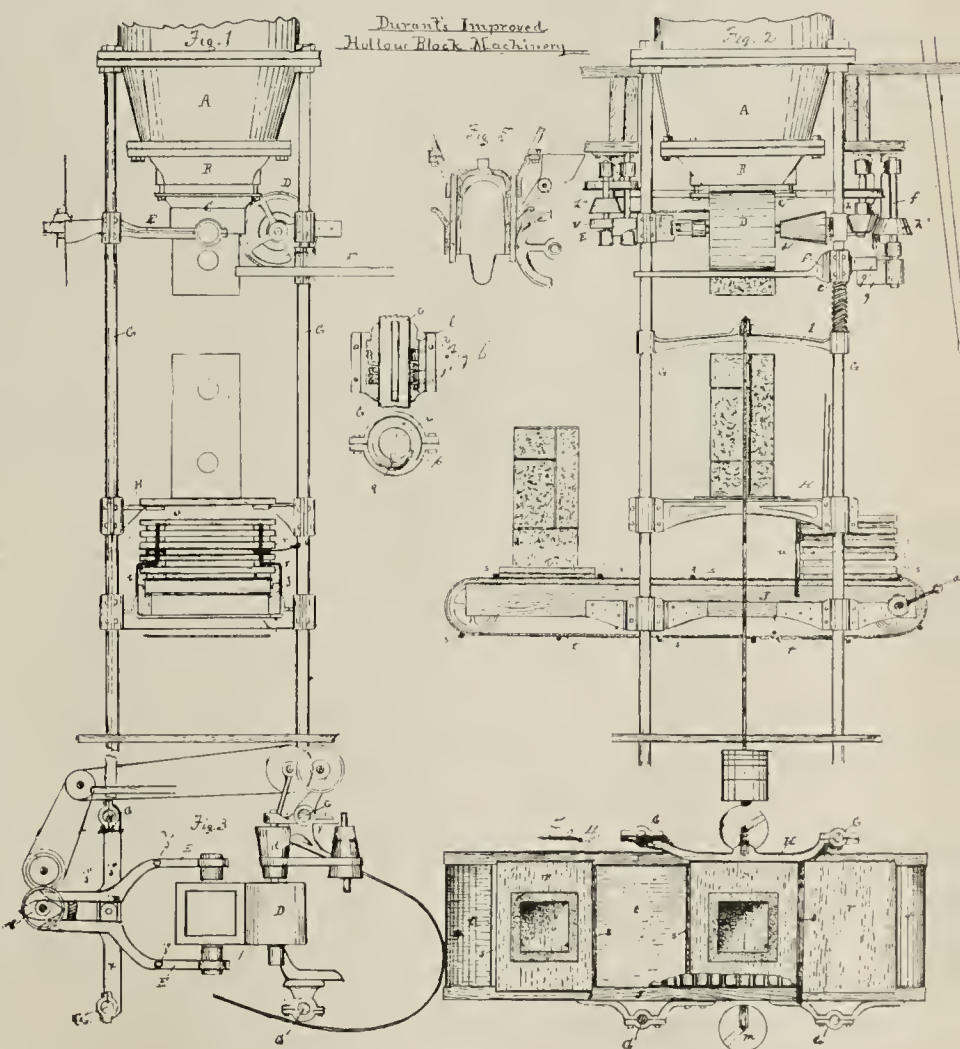
The table "G" being properly counterbalanced for the work it is to perform, and the cut-off and perforating mechanisms being properly adjusted for their work, the machine is set in motion.

The descending stream of clay, when it reaches the table "G," rests upon and carries it downward, and when the required length of block is run out the automatic cut-off performs its work, making a shearing cut from face to rear. Meantime the perforating apparatus has performed its function in accordance with the setting of the trip.

Immediately the cut-off is performed the receiving table descends with its load at an accelerated speed, carrying the cut-off mechanism—which has been descending in unison with it—until a point is reached where the cut-off wire can be returned to position for its next stroke, without interfering with the clay column. The receiving table continues to descend until its load rests upon the delivery table, when it receives another pallet and ascends to receive the next block.

The delivery table, as shown in the cut, is operated by the attendant, who gives the crank, "A," a half turn. This forces the bottom pallet in the pile shown on the table forward, which, in turn, forces the loaded pallet on the receiving table forward to a point where it clears the receiving table, which, lightened of its load, at once returns to receive the next block. (As has been before stated, this hand crank movement will be dispensed with and power movement take its place.)

It will be evident to men intelligent in such matters that the machine here shown will be very useful in the production of a high-grade of fire-proofing blocks, drain tile, pipe and other



hollow wares (leaving off the ornamenting and perforating apparatus), especially so for larger sizes, on account of its end delivery on pallets and its cut-off mechanism. When sills, lintels, flue linings, doorsteps and other long wares are being made the delivery table can be dropped to a point flush with the floor, permitting lengths up to six feet being made. Hoppers for

storing and delivering, coloring matter and powder for surfacing may be stationed as shown at — in Fig. 5, where a double hopper is shown, provided with two compartments, the one for powdering the ornamenting rolls and the other for depositing slip, glaze or any other desired finishing material, in the receptacle between the forming and finishing dies, to be scratched and worked into the face of the block before it reaches the ornamenting rolls.

There is one feature, common to all auger machines, which, to our mind, calls for an improvement. We refer to the fact that such machines are geared and belted to run at a given number of revolutions per minute, according to the recommendation of the machine manufacturer or the judgment of the user. Whereas, the work of the hollow block manufacturer and the tilemaker requires a largely varying quantity, both of material worked and of power, and to meet the varying conditions both a regard for economy and in the interest of uniform high grade of product demand that there should be a choice of at least three speeds, according to the work to be done.

Take an illustration: The tile manufacturer, in extreme cases, produces tile from three to twenty inches in diameter, more frequently from three to twelve inches. Now, a machine that is properly speeded to make a high grade of four-inch pipe is unfitted to make an equal grade of twelve-inch, and why? There is about four and a half times as much material in the larger size and three and a half times as much friction surface, and it is very evident that much more power will be required to compact the larger mass than the smaller. A machine in which the speed could be adapted to the work would be a step in the right direction, but as auger machines are constructed there seems little chance for regulation of speed. The back pressure resulting from expelling a stream of clay through the smallest dies of a machine is enormous, and the waste of power is proportionate. Of course, the only way has been to regulate the machine for best work on medium sizes of wares, but this can only be at the expense of the extremes.

In the machine shown the arrangement is such that three sets of gears may be supplied, and, with tackle always in position, a change of gears could be effected as quickly as dies could be exchange. The more rapid movement of a small column of clay under equal power conditions poorly compensates, and often at a disadvantage.

Before dismissing the details of manufacture it may be well to refer to other methods of producing ornamental blocks, which are resorted to in a limited way without calling in the aid of special machinery appliances. There are two methods of producing chipped faced wares in imitation of "rock faced," and the production is confined to this class of goods.

The Haydenville Manufacturing Company, of Haydenville, O., make from their very beautiful clays a highly glazed block, both of rich dark brown and sea green colors, having faces about 5x10 inches and a depth in wall of perhaps 4½ inches. These blocks are first run out of a machine and cut to length; they then pass through two power repressing operations, in which the back is chambered and a panel is raised on the face. When thoroughly dry the paneled face is chipped to secure the broken rock face. Of course, these blocks are expensive, and the use of them is confined to ornamentation strictly.

The second method was referred to in the March, 1896, number of the Clay-Worker, and is to be found in the paper read by I. W. Everal at the meeting of the Ohio Convention of Clay-workers. Here the method mentioned was the running out by machine of plain blocks, and, after burning them, chipping their faces. It may be said of blocks so made that in parting with the outer skin of a block face considerable strength is also parted with, and a porous surface is thereby exposed to the action of frost and the absorption of water, while the imprinting of a figure has just the opposite effect.

In later papers the writer may take up the subject of building construction in the use of hollow blocks.

Written for the CLAY-WORKER.

AN OLD AND SUCCESSFUL FIRE-BRICK WORKS.

1854-1897.



THE BROOKLYN FIRE-BRICK WORKS, after a profitable and constantly increasing existence of more than forty years, has just added to its extended line of fire clay products, the manufacture of stove lining brick.

The great demand of the New York trade has for a long time been somewhat hindered by the want of a factory for the making of stove linings near to this growing center of business. To meet and supply this long-felt necessity a consolidation of the Stamford Stove Lining Works and the Brooklyn Fire Brick Works has been perfected.

Mr. H. A. Perkins, the founder and proprietor of the well-known Stamford works, has removed his interests to the Brooklyn works, and is now the secretary of the consolidated companies.

The established reputation of the Stamford stove lining manufacturers will, of course, insure to the Brooklyn works a well developed business, which added to the most excellent



EDWARD D. WHITE, President Brooklyn Fire Brick Works.

and extensive trade of their own special product, will help to keep these works in the forefront ranks of the fire-brick industries of New York.

The Brooklyn fire-brick works was organized in the year 1854, on Van Dyke street, near the Erie Basin, by Mr. Joseph K. Brick. The original establishment was not a very large one, but the good quality of its products soon created a market far beyond its capacity. "Make only the best," was the motto of its founder, and the results have demonstrated the soundness of that maxim. Thus encouraged, Mr. Brick erected larger and new additions to his buildings and furnished them with the most approved machinery for his purpose, and sought the best trained and most skillful workmen to operate the works.

The location of the factory giving him convenient and economical access to the clay mines of New Jersey and Long Island, suggested to Mr. Brick that he might succeed in making gas retorts in America, which heretofore were exclusively of imported manufacture. The attempt proved a great success, and here were made the first American gas retorts in the United States. The demand for gas retorts soon compelled another enlargement of the works, and in 1859 Mr. Edward D.

White joined in partnership with Mr. Brick, and the works were extended to meet the increasing business.

In 1867 Mr. Brick died, and the name of the firm was changed to Edward D. White & Co. Fire-Brick Works. Under the new title the business still continued to grow and maintained its well-earned reputation, by always making only the best. In 1893 the business was incorporated under the designation of the Brooklyn Fire-Brick Works, the name it is now known by. The present officers of the company are: Edward D. White, President; A. H. Gutkes, Vice-president; H. A. Perkins, Secretary.

The present works are very large, covering an entire square, fronting on Van Dyke and Elizabeth streets and the Erie basin, the office building and the warehouses being upon the opposite square on Van Dyke street. All the buildings are constructed of stone, brick and iron, and are almost fireproof. All the kilns are within the buildings and are of a most substantial character, some of them being more than thirty years old and still in perfect condition. The works are under the superintendence of Mr. Frank E. Reeder, who has grown up with the works and is well posted in all that relates to the management of the plant and the erection of such retorts and muffles as are made here.

Everything about these works, from the machinery to the kilns and storage, is of the best and most permanent character, the facilities for working, the convenience of handling, and the comfort of the employes being all thoroughly provided for.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK.—Second Paper.



AMERICAN BRICK ARCHITECTURE of the present has created a complex color problem and the scale of colors now in use is indeed a large one. Colors which ten years ago could not have been obtained are to-day regular features in the market. We have now clear white, light and dark buff, cream, old gold, rose, terra cotta, all shades of red, gray, brown, speckled, mottled and flashed brick. And still the architects ask for more shades and new color combinations. It is hardly necessary to state that the color problem is of great importance to the front-brick manufacturer. It determines to a large degree his hold on the market and often involves the success or failure of a brick plant.

—The Varying Colors of Clays.—

A knowledge of the principles underlying the coloration of clays should clear up many difficulties and open new avenues of work. For it is evident that the color changes of clay are reproduced by certain definite causes. Very little, if anything, has been done along this line of investigation in this country and the credit of having hewn a path through this seemingly



OFFICERS OF THE BROOKLYN FIRE BRICK CO., H. A. Perkins, Secretary; A. H. Gutkes, Vice-Pres.; Frank Reeder, Supt.

There are large fans for ventilation and drying, a large plunge bath room, with hot and cold water and clean towels for the use of the workmen at the close of the working day. Cleanliness in the workshop and in the workmen is expected and enforced. The drinking water passes through a long coil of pipe packed in ice, so that it is cold and pure, the very questionable practice of a common cup dipping into a tank of iced water being thus avoided. There are many old employes found in each of the departments, an evidence that this company recognizes a spirit of mutual interest, which the past and present management have found to be an incentive to faithful service and good work, which alone can insure to any concern the highest and best quality of product.

The varied products of the Brooklyn Fire-Brick Works are in demand and are shipped to widely separated points, reaching from Maine to Oregon, and through all that vast territory they demand and receive the best prices paid in the market for fire-clay goods.

The motto of this company has ever been, and under the new management of H. A. Perkins will surely be, "Attend strictly to your own business. Make only the best. Good prices follow."

JAMES TAYLOR.

hopeless tangle of empirical wilderness belongs to Prof. Dr. Seger, who has conducted a large number of experiments with all classes of clays.

The following relations exert an influence upon the coloration of clay ware:

1. The quantity of iron, manganese and other coloring oxides present.
2. The quantity of lime, magnesia and alkalies.
3. The condition of the fire gases during the burn.
4. The degree of vitrification.
5. The temperature.
6. The quantity of sulphur compounds.

1. As is well known, the iron oxide is a red body, which imparts to the clay, if not unduly influenced by other conditions, a red color at a point below that of vitrification. At a vitrifying heat the color is changed to dark red, or sometimes to a brownish or bluish tint, if the fire gases are oxidizing. If the latter are reducing, black is produced, owing to the reduction of the iron either to the ferrous form or to metallic iron. The more iron there is present the deeper will be the shade produced. Of the other metallic coloring oxides, manganese may be present, but it will always occur in such small quantities that its influence may be neglected. The same is true of any other metallic compounds. Manganese will produce a gray color in light, and brown in red-burning clays.



BIRDS EYE VIEW OF THE BROOKLYN FIRE BRICK CO'S WORKS. See page 278.

Lead has a tendency to give yellow. The iron oxide may thus be considered the only important coloring ingredient of clays, and to it we must look for the production of different tints and shades. Not only the quantity of iron present, but also the presence of other constituents determine the color to be produced.

2. Lime, magnesia, potash, soda and alumina are the common ingredients of clay, and by themselves burn to a white color. But they exert a decided influence upon the coloring process nevertheless. If the iron in the clay is low, but the alumina contents large, and the burning temperature high, the clay will have a more or less yellow color, which with less alumina and increasing iron rises through all shades from yellowish brown to reddish brown. A decided red color will appear only when the iron rises to 5 per cent. and above.

Like alumina, lime and magnesia fade the red color of clay, and they do it the sooner the higher the temperature. Thus, if to a clay containing 5 per cent. of iron oxide 10 per cent. of carbonate of lime are added, light buff will take the place of red, and if the temperature is raised high enough, this color again will be replaced by yellowish green. The question of how the iron is affected by lime in order to produce these changes has not yet been fully decided. Some claim that a double silicate of iron and lime is formed which is colorless. But Dr. Michaelis seems to get nearest the truth. He assumes that the color reaction is analogous to that produced in Portland cement, in which, he claims, the coloring substance is a combination of iron oxide and lime, a compound which is olive green.

As has been already mentioned, Dr. Seger has made extensive researches along the line of clay colorations, and it may prove profitable to look over his results. He used three groups of clays, each being composed of a number of clays in actual use. The kiln conditions in each case were oxidizing.

Group I, clays with little lime (less than 2 per cent. of lime and magnesia), 2 to 4.5 per cent. of oxide of iron and 2 to 3 per cent of alkalies produced, when burned quite hard the following colors:

Ratio of iron oxide to alumina.	Color.
1 : 13.2.....	White to yellowish.
1 : 7	Light buff.
1 : 5.4.....	Yellow to light brown.
1 : 7.2.....	Yellowish brown.
1 : 6.3.....	Buff.

Group II, clays low in lime (3 per cent. lime and magnesia

and less), with 5 to 8 per cent. of iron oxide and 2 to 4 per cent. of alkalies.

Ratio of iron oxide to alumina.	Color.
1 : 2.8.....	Dark red.
1 : 2	Dark red in violet.
1 : 1.9.....	Dark cherry red.
1 : 2.9.....	Dark red.

Group III, high in lime, 11 to 19 per cent. of lime, 4.5 to 6 per cent. of iron oxide, 1.5 to 4 per cent. alkalies.

Ratio iron oxide to alumina.	Ratio iron oxide to lime.
1 : 2.3	1 : 2.9
1 : 1.6	1 : 3.2
1 : 3.1	1 : 2.2
1 : 2.5	1 : 3.5
1 : 2.4	1 : 2.2

All of these clays produced red to flesh color when burned quite low, light buff to sulphur yellow burned hard, yellowish green to green when vitrified. Finally, when incipient fusion has set in, dark green to black is produced, owing to the formation of a ferrous lime silicate. Magnesia, according to all appearances, acts exactly like lime does.

It can be said that red will be produced if the clay is high in iron, with a low or moderate quantity of alumina and lime. If the alumina rises and the iron is decreased, light or dark buff is obtained. It is of great importance in what form the iron is present in the material. If as concretionary iron, iron sulphide, it will cause dark spots to appear, leaving the body light; if in the form of precipitated iron, oxide or carbonate, it will color the body uniformly. It is the latter kind which gives the red of our brick clays. The concretionary iron, pyrites, nearly always accompany the fire clays.

Thus a red-burning clay may be changed to buff or yellow by mixing it with a light clay high in alumina, or with a calcareous material like marl. Similarly, a buff-burning clay is changed to red through the addition of a strongly ferruginous one, ochre, etc. Of course, these changes in composition involve changes in temperature.

The alkalies produce, with iron, greenish coloration, but in order to do this both the contents of iron and that of the alkalies must be quite large and the temperature high. This action of the alkalies explains the fact that impure feldspars nearly always burn to a light color.

We have now considered the principles of clay colors from the chemical standpoint, but have neglected to take into account the physical conditions. These play an important part,

inasmuch as they can retard chemical action to a greater or less degree. It is obvious that a clay composed of very fine particles will obey more readily the chemical laws than one consisting of coarser ones. Likewise, in the first case vitrification will take place at a lower temperature than in the second one, provided, of course, that the chemical composition be the same. This very fact prevents us from depending entirely on chemical analysis as a means of judging clays regarding their color and burning temperature, but it cannot be denied that chemical investigation will bring to light the foundational truth of the constitution of clays, and we have no right to sneer at chemistry for not doing more. The gross chemical analysis, supplemented by the "rational," will give an insight into the principles underlying the behavior of a clay which nothing else can accomplish. And when the mechanical analysis—the separation of a clay into its physical constituents: clay, silt, sand of different degrees of coarseness, rock dust and mica—is once perfected and applied, it will be possible to picture all the peculiarities of a material.

3. During the burning, conditions are brought to bear upon clay which are of the utmost importance as regards the color of the same. In the preceding paper the writer has stated several examples relating to the influence of the fire gases, oxidizing and reducing, in order to secure due prominence for this so very important subject. As has been said in the last paper, the kiln gases, with excess of oxygen, oxidizing, tend to produce the red color in the common brick clays, while the reducing atmosphere, which is deficient in oxygen, has a strong tendency to change the red to gray, brown or black. Dr. Seger investigated this subject quite fully. He took four groups of clays, four distinct types, and investigated the influence of the reducing and oxidizing gases by burning the trials in furnaces in which the respective conditions were strictly carried out. Part of the test pieces were cooled by admitting air to them; others were cooled in a flow of reducing gas.

I. Buff-burning clays, containing iron and lime. Under oxidizing conditions dark red heat produced a dirty red, medium red heat a flesh color, strong red heat buff with a tint of brown, at the same time forming an iron-lime silicate. Reducing gases changed these colors to black, which color disappeared if air

was again admitted. After a reducing period the color appeared lighter than before reduction, with a white or greenish tint. From this it seems that alternate reduction and oxidation tend to produce light colors.

II. Red-burning clays, low in alumina, high in iron, and free from lime. On admitting air freely, the clay burned red, which became deeper with increasing temperature. Reducing atmosphere produced gray to velvet black. Reducing gases are not favorable to a clear red.

III. White and buff-burning clays, free from lime and poor in iron. With excess of air and steadily increasing temperature the colors obtained were pale red, flesh color, yellowish white; in brightest red heat the color was straw color. Reducing conditions produced a grayish tint, which again disappeared on admission of air, when the original colors seemed to have become lighter. A second reduction again resulted in a lighter shade on reoxidation. Very frequent changes, however, give rise to brownish tints.

IV. White-burning clays, rich in alumina and poor in iron—kaolin. Oxidizing conditions produce a more or less white color. Reduction results in a bright gray, which becomes white again if excess of air is again admitted.

4. The degree of vitrification which a clay undergoes has considerable influence upon the color. Porous materials are lighter in color than denser ones, which contain the same amount of iron. Naturally, a clay becomes darker with increasing vitrification.

5. Ordinarily, the color of a clay becomes darker with the increase of temperature, but there is an exception. If a clay contains carbonate of lime, but not enough of it to neutralize the red of the iron oxide entirely, the lime continues to fade the color of the iron as the heat rises. In materials free from lime the iron alone determines the color.

6. So far, the color conditions discussed involve only the legitimate ingredients of clay. But very often other and sometimes injurious factors have to be considered, as the incrustations formed on the surface of ware made from all kinds of clays, and peculiar red discolorations on buff-burning, calcareous materials. These phenomena are only too well known



A GLIMPSE OF THE WORKS OF THE BROOKLYN FIRE BRICK CO. See page 278.

and cause great loss to the front-brick manufacturer. At the bottom of both is sulphuric acid in its various compounds. The incrustations, vulgo, whitewash, are sulphur salts which have formed on the surface and have become attached to it in burning.

These salts may have come from the clay, being natural ingredients of the same, or from the water which was used in soaking it. Or they may have been produced in the kiln during the first stage of the burn. In the latter case the clay, containing lime and alkalies, came in contact with water of condensation which carries sulphuric acid if coal is the fuel used, or sulphurous gases. As a natural result, alkali and lime sulphates are produced, which form a coating on the surface and eventually vitrify with the body so intimately that they cannot be removed. But another case is likely to occur. The burned brick may contain undecomposed sulphates within the pores. After being walled up and being penetrated by moisture, which takes up the salts, the latter are expelled to the surface till they are completely removed. This is very often the origin of the unsightly efflorescence so familiar to the brickmaker and builder.

The peculiar red discolorations made mention of as being due to the action of sulphuric acid upon calcareous clays are a very interesting example of the influence of this powerful acid, which is able to defy the silicic acid even at comparatively high temperatures. Lime is a base which combines very readily with sulphuric acid, and with it forms sulphate of lime, which is a compound very difficult to break up. Now a clay containing, say 10 per cent. of lime, during the first stages of the burn absorbs sulphuric acid like a sponge does water. This, of course, takes place only when there is a sulphur compound from which to obtain the acid, and this would naturally be the case if coal is used for fuel. Wood could not furnish a sufficient quantity of the acid to cause any injurious effect. Now, if the calcareous clay were burned with wood, a clear buff would be obtained, but as soon as sulphuric acid is given a chance to combine with the lime and no precautions are taken to remove this acid from the clay by manipulating the burning, the red discoloration of sulphate of lime will be almost sure to appear. A very interesting instance of this trouble is furnished by the history of the early continuous kilns in Germany. In the vicinity of Berlin front brick are largely made from calcareous clays, containing a high percentage of lime. In the old clamps and in the down-draft kilns the brick always burned a good buff. In the former type of kiln wood was used for fuel, in the latter both wood and coal, but as the firing is usually done in these kilns, reducing gases were produced after each fire, and this very fact was of prime importance in getting good colors. In the new type of kilns, the continuous system, there was no opportunity whatever for producing reducing gases; the kiln conditions were absolutely oxidizing, which are favorable to the formation and maintenance of sulphates. Great financial losses and a hostile feeling towards the continuous kiln were the result of this change, and many were at the point of pulling down the new kilns and returning to the old way of firing. At this stage Dr. Seger was called upon to investigate the cause of the trouble, a task which he solved without difficulty. He proved that it was necessary to produce frequent periods of reduction in order to destroy the red coloration caused by the sulphates. And he demonstrated the truth of this assumption by burning clear-colored brick in the very kilns which had given so much trouble. This he accomplished by closing the flue dampers every few hours and filling the red-hot kiln chambers with dense reducing gases. In doing this he called carbon monoxide, the powerful constituent of reducing gases, to his aid in order to break up the sulphate, to expel the sulphuric acid, liberate the lime and give it over to the silicic acid, which in itself was not strong enough to size the base from the other acid. Thus we have now, not a reddish lime sulphate, but the normal buff lime silicate. No trouble was experienced afterwards in obtaining the desired color if due care was exercised

to produce the required number of reducing periods. Dr. Seger likewise diminished the amount of sulphuric acid conveyed from the coal to the brick in the continuous kiln by providing an improved method of watersmoking, in which dry, warm air from cooling chambers was led into the last chamber, thus avoiding condensation.

All that has been said in this paper may not seem to bear much relation to the subject of American front brick, but it involves matter which goes towards explaining some common phenomena of the business. We can never expect to be certain of results until we pay some attention to the theoretical investigations of trained observers and encourage them.

AMERICUS.

Written for the CLAY-WORKER.

THE CLAYWORKING INDUSTRIES OF AUSTRALIA. No. 7.

The Bendigo Pottery Works.

BY F. A. CAMPBELL, C. E.



ONE HUNDRED MILES north of Melbourne lies Bendigo, an important mining city, whose fame as a gold producing district is world wide.

Forty-five years ago gold was discovered in Victoria, and in the early "fifties" the Bendigo diggings drew, like a mighty magnet, men from all parts of the world. Its importance as a mining center may be estimated from the fact that during the forty-five years of its existence sixty million pounds worth of gold has been raised from its soil. As the surface gold became exhausted crowds of working miners were gradually replaced by capitalists, who proceeded to develop the reefs, and the canvas town became one of brick and wood. Bendigo of to-day is a handsome city, the third in importance in the colony, with a fine agricultural and pastoral country around and rich quartz reefs below ground, from which by the aid of splendid machinery, large quantities of gold are still obtained from a depth reaching in some cases half a mile below the surface.

In the year 1858, when the gold fever had somewhat abated, a potter, bred to the work in Scotland, came and settled in Bendigo, and started some works in a small way, making drain pipes and flower pots. The difficulties to contend with must have been great. Before the wares could be made, the men had to be trained, but the pioneer worked hard and undauntedly at the business of making potters as well as pots. No machinery was used in those days and the buildings were of an unpretentious kind. Steady industry and enterprise triumphed and the business grew, a pipe machine was purchased, worked by hand; then several years later steam power was added and other machinery from time to time. So the industry went on and prospered, until in 1882 the concern was sold to a company for the sum of \$100,000, the vender still retaining an interest in it. After a trip to England, he was appointed by the company managing director, which position he holds to the present day. A portrait of this successful clay-working pioneer, Mr. G. W. Guthrie, is given. It is the portrait of a man who has done more probably than any other for the spread of the knowledge of this branch of the business in Victoria.

The company owns sixty acres of land, about two miles out of the city, upon which the works are situated, and from which both red and white clay of good quality is obtained. A great variety of ware is produced by the company, including stoneware, such as acid jars, ginger beer bottles, ink bottles, filters, demijohns, etc., Rockingham ware teapots and jugs, white ware jars, jugs, cooking dishes and domestic utensils of many

kinds, terra cotta vases and water bottles.

Lately, like most clay works in the colony, the manufacture of sewer pipe and glazed closet basins has been added, contracts for both having been obtained from the Melbourne sewerage board. The plant consists of three circular down-draft kilns, twenty-five feet in diameter, for burning sewer pipe, two up-draft stoneware kilns for burning the salt-glazed brown ware, one up-draft Bristol kiln for jars, ginger-beer bottles, etc., two biscuit, and three gloss kilns, up-draft, for Rockingham, cane ware and plain white ware.

A slip kiln was formerly used for drying the clays after blending, but this is almost entirely suspended by the filter press, which is found much more rapid and satisfactory. The machinery for preparing the clay, such as grinding and mixing are of the usual type for such work and so is the sewer pipe press, which is one capable of turning out pipes up to four feet diameter, worked at eighty pounds pressure. The power for working the plant is obtained from a 12 H. P. and 5 H. P. engines, supplied from a thirty foot by six foot six inch Cornish boiler.

The method of manufacture does not differ on the whole from the English practice. Some of the plain wares are turned on wheels which are driven by steam power, instead of the old kick wheel or hand-turned geared wheel. The accompanying photograph will give a good idea of the interior of the works, showing the men at work in various departments and quantities of finished work ready to go out.



MAKING TEA POTS AT BENDIGO POTTERY.

A special feature of this company's manufacture is the excellence of their stoneware. For the large jars used to keep strong acids in, the Bendigo company appear to have almost a monopoly, their ware being absolutely impervious. This result is due both to the suitability of the clays used, as well as careful management in the manufacturing processes. Something has also been done by this company in the direction of artistic terra cotta work. While the quality of the ware is all that could be desired, it must be admitted that the designs are capable of improvement. This remark applies to all the terra cotta work yet produced in the colony. It is a pity that a little more attention is not given to this point by the colonial manufacturers. It is as cheap to make an artistic vase as an inartistic one, once the design is obtained. But the manufacturer hitherto has not apparently seen the necessity for obtaining anything beyond manipulative skill from his employees. The company employs about 150 men all told, and from eighty to ninety tons of wood are consumed as fuel per week.

The chairman of directors is Sir John McIntyre, a prominent business man and a member of the Victorian legislature, and the company appears to be managed as well in its commercial as in its technical department.

Written for the CLAY-WORKER.

UTILIZING WASTE HEAT FROM THE KILN.

THE PROBLEM of using all the heat generated in a furnace is an old one, and the more I think of it, the more am I convinced that it is one of those interminable problems that affords one only an approximation. It must be so, from the very nature of the case. By burning a combustible body we generate heat, and we start combustion by friction; that is, we generate sufficient heat by friction to ignite a very sensitive combustible, generally phosphorus or sulphur, and this in turn inflames wood. Thus we kindle a fire, which at once begins to throw off heat in every direction. Now this seems simple enough, and any child five years old can do it. But not everyone that can strike a match and apply it to shavings and sticks of wood knows how to kindle a fire properly. How often does the fire refuse to burn and send puffs of smoke and flame out at the front, instead of proceeding along the flue and up the chimney; especially is this the case where there is a down-take and underground flue to the chimneys; let the chimney and underground flue get cold and your furnace—obeying a natural law—refuses to burn. Burn a bag of shavings at the bottom of the chimney. This will heat the column of air in it and start it rising. The cold air in the flue will immediately follow suit and rush to the chimney, and the smoke, flame and products of combustion in the furnace will at the same time move into

the flue, the outer air will flow into the furnace, and the fire at once begins to clear and brighten. Now all this points clearly to a case of heat consumption apart from the ware or material to be heated and for which the fire was kindled; there is a sort of interdependence of the furnace, flue and chimney; if the flue and chimney are not kept hot, the draft slackens in speed, and the furnace works slower and colder, and, of course, the chimney and flue depend on the furnace for their heat.

Now, if the heat reaching the chimney is only just sufficient to give the draft proper speed, it is a mistake to attempt to utilize any of it. On the other hand, if there is abundance of draft that has constantly to be checked by the damper or otherwise it is evident some of the escaping heat may be used for other duty, heating feed water, or drying green bricks, etc., remembering not to pinch the flue and chimney. That there is an enormous amount of fuel in the shape of heat

leaves the kiln unused no one will deny, but, as I have shown above, some of the heat generated is used in hoisting the products of combustion considerably higher than the chimney, which is absolutely necessary, for, if they were not so disposed of they would soon smother the fire out. If you want to see this exemplified in a very simple manner, take an empty tomato can and with one hand hold it open-end down, with the other hand put a lighted candle up into it until the flame just touches the bottom. In this position two or three minutes is sufficient to smother it out.

—Heat and Power Required to Maintain Draft.—

Some one may perhaps remind me that the heated gases rise in the chimney on account of their lightness, or specific gravity, and do not require hoisting. Well, yes; that is just how it happens, but let us look a little deeper into it and see really how much hoisting must be done to produce and maintain draft. From my desk I can see a smoke stack, or chimney, which is 120 feet high. It receives the products of combustion from the grates of two Babcock & Wilson boilers,

which require three gross tons of coal per day of twelve hours. I have observed the smoke from this chimney on calm days, and it rises in a column easily 200 feet above the top of the chimney, but to be nicely within bounds let us say 120 feet above. This would make a column 240 feet high. Now, three gross tons of soft coal would furnish about three net tons of combustible, allowing 10 per cent. for ash, etc. Soft coal, such as they are using, would contain about 5 per cent. of hydrogen. Assuming, then, that this coal is properly burnt, the carbon to carbonic acid and the hydrogen to water vapor, or steam, there would be ejected out of the top of that chimney during the twelve hours running, 20,000 pounds of carbonic acid and 2,700 pounds of steam, and 67 tons of unconsumed air! Now, if this invisible, but nevertheless ponderous weight is not actually hoisted 240 feet or more by blocks and tackle, rest assured it requires just the same amount of power as would hoist 38,000 bricks of 4 pounds each to that height. This, then, represents the force or power in this particular instance, that is required to produce and maintain draft.

Returning now to the query of the lightness of the waste products or gasses. It is quite true that their low specific gravity, or lightness is apparently why they rise, but the cause of it all is, they have absorbed a certain amount of heat, which caused them to expand to two or three times their original bulk and to that extent they lost their specific gravity. In passing through the spaces between the tubes on their way to the chimney they gave out a good portion of that heat, and when they arrive at the bottom of the stack are only 400° or 500° F., or considerably less than twice their original or cold bulk, this being quite sufficient to make them rise rapidly up the chimney. Now to rob the gases of these 450° of heat by taking them for other duty would slacken the draft to just that amount or render it useless. I recall a case that took place about ten years ago. A distillery with a battery of ten boilers thought to economize by putting in a feed-water heater. They built a receptacle at the bottom of the chimney where all the waste gases from the boilers were intercepted by the heater. The result was spoiled draft, and a good feed-water heater thrown out. They were warned that this would occur, as their flue gases were not entering the chimney excessively hot. Bearing in mind that the temperature of steam in a boiler at 100 pounds per square inch is 337° F., the temperature of the gases entering the chimney may be 400° to 450° without being considered wasteful. I have known cases where the boilers were inadequate and had therefore to be pushed, in which the flue gases entered the chimney at a much higher temperature, and which was absolutely necessary to keep up the quick combustion on the grate.

I may just cite another case of erroneous ideas in heat economy. An ironmaster with a notable amount of good hard common sense, but rather deficient in book lore, observed how quickly the roof of his heating furnace melted away, and this he thought was effected by heat that went over the iron without doing much good. The idea struck him one day—and hundreds have been struck with the same or similar ideas—that by placing a boiler on his furnace so that its bottom would form the roof of the furnace he would effect a double saving; the heat that he thought did little more than melt his furnace roof and the firebricks composing that roof. When speaking of the result of this improvement, he said: "The boiler steams like the very devil, but the furnace is an iceberg so far as heating iron is concerned." I may here remark that a heating furnace in a rolling mill is said to be "cold" when no hotter than an ordinary brick kiln at its highest heat, and really is so, practically.

This letter is to some extent suggested by a communication from a very intelligent and interesting contributor to the Clay-Worker, who will in the near future treat its readers to some good practical letters on kilns, driers, etc., which diverts my mind from boilers to brick and other kilns. I may, however, remark that the self-same laws that govern the draft of steam-boiler furnaces govern kilns and all other furnaces.

—A Small Calculation with Much Significance.—

In looking over my calculations on the heat or power requisite to maintain draft, I missed one which is intended to make plain the power required to expand air or other gases. If we confine a cubic foot of air, hydrogen, carbonic acid or any other gas in a box, say one foot square and two feet high, by a movable lid in the center of box, which we will suppose is air tight, any successful attempt to raise that lid would have to overcome atmospheric pressure, and to raise it one foot a force or pressure of over 2,000 pounds must be overcome. This, then, is the force which must be applied to expand a cubic foot of air or gas to double its volume, and the

same force will compress it into half its volume. My object in drawing attention to this is to dispel the idea that no power or force is exercised in reducing the specific gravity of the waste gases so that they may rise rapidly in the chimney.

—Methods of Using Waste Heat.—

The kiln of the future is the one that will use all the heat available. The continuous kiln seems the nearest approach to this at present.

Some two or three years ago the patentee of a continuous kiln announced his intention of improving his kiln to the extent of furnishing all the steam needed to run the works by a system of combined kiln and boiler. This improvement has not yet materialized, nor have I seen or heard any more about it. He, however, is not the only one imbued with this idea of generating steam by the waste heat, but he is the only one I have ever known who thought of connecting a continuous kiln to a steam boiler. Perhaps he begrudges the heat absorbed by the kiln walls and roof and wishes to try the experiment of my friend the ironmaster. I was very much surprised that this gentleman should so commit himself, because his training and education have been much superior to the ironmaster's.

The generating of steam would be the last thing I would attempt by the waste heat from kilns. If the heat of the flue gases would warrant it I would put in an economizer, or feed-water heater, but not a boiler. It has been suggested that the heat of the flue gases might be supplemented by an oil burner. To this I would say, no combustible would burn in an atmosphere of flue gases; the oil sprayed in would simply be wasted. If you want to see the effect of flue gases on a moderately sensitive combustible, try to light a spill of paper or pine wood at a kerosene lamp, by dipping down the glass chimney into the flame. The flame will ignite the spill, but unless you snatch it out of the chimney very dexterously, it is quenched before it reaches the top of the chimney, or get to the top of any low chimney and thrust a lighted torch into the escaping gases. As I have said several times before in this journal, the gases resulting from perfect combustion are the most effective agents for quenching fire known.

To me there seems to be at least three places where waste heat could be used to advantage: in the dryer, in the kiln for watersmoking, and in the economizer, and for all three I would recommend forced draft. It is cheaper and more reliable than natural draft. With the Dutch kiln, and in fact all open-topped kilns, entrapping the waste heat is out of the question, or nearly so.

In the early portion of this paper there appears to be a good portion of matter that seems foreign to the subject in hand. I am aware many hard-working clay-workers would like to work their economies by receipts cut and dried, but there are natural laws and principles underlying every improvement which will not be ignored, in fact, every improvement in any department of the industrial world are but so many acknowledgements of previous ignorance of some simple natural law. The principles or laws governing draft should be quite familiar to those who contemplate any economy in heat. The calculations may seem somewhat abstruse to the majority of clayworkers who have not familiarized themselves with the scientific aspect of draft, while there are others who will follow me as easily as if I read them a couple of chapters out of the New Testament.

There would be no economy in taking heat from where it could not be spared; you must therefore know the amount going away and the amount of this that must necessarily go, before you can determine how much there is to spare for other duty. I therefore endeavored to impress on the mind by these calculations, that it takes a great deal more to produce and maintain draft than is generally conceded. Here I may say that the calculations all refer to natural draft, or more correctly, chimney draft. There are also other considerations in using up waste heat besides fuel economy, and one of the most important is, will it pay? for it sometimes happens that the cost of utilizing waste heat robs it of all economy; therefore the least costly method that will effectually use it up is to be preferred, and that is one reason why I would prefer any method almost to the steam boiler. To those clay-workers who would like to calculate the weight of waste gases issuing from their smoke stacks in any given time, I would offer the following simple and easy rule. From the weight of coal used, take the weight of ashes made and twenty-five times the weight of the coal less the weight of the ashes is the weight ejected from the chimney, or in symbols, Coal—ashes x 25 equal waste gases. If you are working as close as this you may congratulate yourself that your practice is up to date.

WM. WAPLINGTON.

When the wind is favorable, use a little more sail. More money will be spent in the next six months than in the last six. Judicious advertising will help to catch some of it.

Written for the CLAY-WORKER.

HOW MANY?

By IRA O. BAKER, Professor of Civil Engineering, University of Illinois, Champaign.



RICK MAKERS, engineers and city officials frequently have occasion to ask: How many brick required for a yard of brick pavement? The accompanying tables will answer all such questions at a glance. Full explanations accompany each table, so that little need be said here. Probably the following example is sufficient:

TABLE I.*

NUMBER OF BRICK REQUIRED FOR ONE SQUARE YARD OF FOUNDATION COURSE.

Brick Laid Flatwise With $\frac{1}{4}$ -inch Joints.

Length of Brick in Inches.	Width of Brick, in Inches.										
	$3\frac{1}{2}$	$3\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{7}{8}$	4	$4\frac{1}{8}$	$4\frac{1}{4}$	$4\frac{3}{8}$	$4\frac{1}{2}$	5	6
$7\frac{3}{4}$	43.2	41.8	40.5	39.3	38.1	37.0	36.0	35.1	34.1	30.9	27.9
$7\frac{7}{8}$	42.5	41.2	39.9	38.7	37.6	36.4	35.4	34.6	33.6	30.4	25.5
8	42.0	40.5	39.3	38.1	36.9	35.9	34.9	34.0	33.1	29.9	25.1
$8\frac{1}{8}$	41.3	39.9	38.7	37.6	36.4	35.3	34.4	33.5	32.6	29.5	24.8
$8\frac{1}{4}$	40.6	39.3	38.1	37.0	35.9	34.8	33.9	33.0	32.1	29.1	24.4
$8\frac{3}{8}$	40.1	38.7	37.6	36.5	35.4	34.3	33.4	32.6	31.6	28.6	24.1
$8\frac{1}{2}$	39.5	38.2	37.0	36.0	34.8	33.8	32.9	32.1	31.1	28.2	23.7
$8\frac{5}{8}$	38.9	37.7	36.5	35.4	34.4	33.3	32.5	31.6	30.7	27.8	23.4
$8\frac{3}{4}$	38.4	37.1	36.0	35.0	33.9	32.9	32.0	31.1	30.3	27.4	23.1
$8\frac{7}{8}$	37.9	36.6	35.5	34.5	33.4	32.5	31.5	30.7	29.9	27.1	22.8
9	37.3	36.1	35.1	34.0	33.0	32.0	31.1	30.3	29.5	26.7	22.4
10	33.8	34.1	31.6	30.7	29.7	28.9	28.1	27.4	26.6	24.1	20.2
12	28.2	27.3	26.4	25.9	24.9	24.2	24.0	22.9	22.7	20.2	16.9

* Computed and copyrighted by Ira O. Baker, professor of civil engineering, University of Illinois.

TABLE II.*

NUMBER OF BRICK REQUIRED FOR ONE SQUARE YARD OF TOP COURSE. The upper number in each case is for $\frac{1}{8}$ -inch joints, and the lower for $\frac{1}{4}$ -inch joints.

Length of Brick in Inches.	Thickness of Brick, in Inches.										
	$1\frac{7}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{7}{8}$	3	4
$7\frac{3}{4}$	82.1 76.2	77.6 72.0	73.2 68.0	69.3 64.8	65.8 61.8	62.8 58.9	59.7 56.4	57.5 54.0	54.9 52.0	52.7 49.8	39.9 38.1
$7\frac{7}{8}$	81.1 75.3	76.2 70.8	72.0 67.2	68.0 63.9	64.8 60.8	61.8 58.1	58.9 55.4	56.4 53.1	54.0 51.1	52.0 49.1	39.3 37.6
8	80.1 74.1	75.3 69.8	70.8 66.1	67.2 62.9	63.9 60.0	60.8 57.0	58.1 54.4	55.4 52.5	53.1 50.8	51.1 48.4	38.7 36.9
$8\frac{1}{8}$	78.5 72.8	74.1 68.9	69.8 65.1	66.1 62.0	62.9 59.2	60.0 56.4	57.1 53.8	54.4 51.6	52.5 49.7	50.4 47.7	38.1 36.4
$8\frac{1}{4}$	77.1 72.0	72.8 67.9	68.9 64.2	65.1 61.1	62.0 58.1	59.2 55.5	56.4 52.9	53.8 50.8	51.6 48.9	49.7 47.0	37.6 35.9
$8\frac{3}{8}$	76.2 70.8	72.0 66.8	67.9 63.2	64.2 60.0	61.1 57.4	58.1 54.7	55.5 52.3	52.9 50.0	50.8 48.2	48.9 46.3	37.0 35.3
$8\frac{1}{2}$	75.4 69.7	70.8 65.8	66.8 62.3	63.2 59.2	60.0 56.6	57.4 53.8	54.7 51.4	52.3 49.3	50.0 47.5	48.2 45.7	36.5 34.8
$8\frac{5}{8}$	74.1 68.9	69.7 64.8	65.8 61.4	62.3 58.4	59.2 55.9	56.6 53.1	53.8 50.6	51.4 48.7	49.3 46.8	47.5 45.1	36.0 34.4
$8\frac{3}{4}$	73.2 67.9	68.9 63.8	64.9 60.6	61.4 57.6	58.4 54.9	55.9 52.5	53.1 50.0	50.0 48.0	48.7 46.1	46.8 44.4	35.4 34.0
$8\frac{7}{8}$	72.0 67.1	67.9 63.2	63.8 59.7	60.6 56.8	57.6 54.2	54.9 51.6	52.5 49.3	50.0 47.3	48.0 45.5	46.0 43.7	35.0 33.4
9	71.2 66.1	67.1 62.3	63.2 58.9	59.7 56.1	56.8 53.6	54.2 51.0	51.6 48.7	49.3 46.8	47.2 44.9	45.5 43.1	34.5 33.0
10	64.1 59.7	60.3 56.1	58.6 52.9	53.8 50.6	51.2 48.3	48.9 45.9	46.6 44.1	44.5 42.2	42.6 40.5	41.0 38.9	31.1 29.7
12	53.5 49.8	50.4 47.0	47.5 44.6	44.8 42.4	42.6 40.4	40.8 38.4	38.9 36.7	36.1 33.3	35.6 33.9	34.3 32.6	26.0 24.9

* Computed and copyrighted by Ira O. Baker, professor of civil engineering, University of Illinois.

How many brick required for a yard of pavement, if the brick are $2\frac{1}{4} \times 3\frac{3}{8} \times 7\frac{7}{8}$? Looking in Table I under $3\frac{3}{8}$ and opposite $7\frac{7}{8}$ we find 38.7, which shows that 38.7 brick will be required per yard for foundation course. Looking in Table II under $2\frac{1}{4}$ and opposite $7\frac{7}{8}$, we find that if the joints are $\frac{1}{8}$ inch each it will require 68.0 per yard for top course, but if the joints are $\frac{1}{4}$ inch it will require only 63.9. Hence, with the closest joints in the top course it will require 38.7 plus 68.0, equal 106.7 brick per yard of pavement; and if the top course has $\frac{1}{4}$ inch joints, it will require 38.7 plus 63.9, equal 102.6 per yard.

The tables can be used in estimating the number of brick required for any proposed job, or they can be used in determining how many brick were broken and rejected on any job, provided a record has been kept of the number of brick delivered.

[Professor Baker has promised to write a series of articles shortly for the Clay-Worker, of which the above is an excerpt made at our request. Our readers will remember that Professor Baker contributed to the columns of the Clay-Worker a few years ago a series of articles on durability of brick pavements, which had great influence in overcoming the antagonism to brick for paving purposes. The specifications and the methods of testing which he there proposed have been widely copied and used.—Editor.]

Written for the CLAY-WORKER.

THE NEW YORK MARKET.



JUST ONE DAY MORE and September, 1897, will be numbered with the past. Taking the month all through, it has been the best for brickmaking this season, so far as the weather is concerned. There have been but few lost days from rain, the sun has done fairly well in his way of furnishing heat to dry the brick on open yards, but the wind has not done its

share, especially the northwesterners, which is the wind that does the work to perfection; east and northeast has been the prevailing quarter from which it has come, and light at that.

According to tradition, the direction of the wind when the sun crosses the line will be the quarter from which the prevailing wind will blow for the next six months. If that holds good, northeast will furnish the wind. In this section it furnishes a rather poor grade for open-yard brickmakers, as it comes from the broad Atlantic and is therefore damp. Most of the yards have had to double-hack, as the brick would not dry; for the few days which remain of the season of '97 it will not cause any great inconvenience, as the yards are in shape at any time to stop. Before this number of the Clay-Worker reaches the subscribers the output of green brick will be finished, except in a few cases, as there are always some who want to be the last; but past experience shows that they generally get left in more ways than one. In years past, if the question was asked of the boss when he was going to stop, he would say, "When I get my shed full." This season, as you walk through some of the sheds where they are all done and not shipping, there is lots of space, and under other sheds, where they will stop next week, there could be put a very large kiln.

Years ago the—will I say old-fashioned?—brickmaker generally expected the last kiln would represent his profits for the current season. If the last kiln this year represents the profits, the size of both kiln and profit is small; from six to twelve arches will be the size. The advice given, through your columns, to those who were about to locate a yard, was that they should be sure of good transportation facilities. I thought it might be of interest to your readers to see how the transportation of brick on the Hudson had changed, in keeping with the output and demand. Tide-water, of course, called for the use of boats. The Hudson River railroad was not in existence when the first yards were built, and it is not long ago that it was used to send brick to market in winter.

—The Days of Small Yards.—

The readers of the Clay-Worker, as they read in its pages accounts of brickyards in different parts of the country and the size of them, cannot have the slightest conception of how "small" they were in the early days of the trade. If it was possible to make the trip along the west bank of the Hudson, between Haverstraw and Newburgh, in company and view of locations of yards of years ago, I am positive that the opinion of all would be that it was not possible to put a yard there, as there was no room. Well, this generation of manufacturers work on a larger scale than the men of that day ever dreamed of. I have seen the remains of a yard which did not take up as much room for shed, yard and machine as one of the yards of the present day dump twenty-two thousand brick on. Impossible that one would be so foolish as to risk his capital in such a place, nevertheless it was done. The butcher, baker, the farmer, in fact, all kinds of trades went into brickmaking, because there was money in it. As the output was small it required small transportation facilities.

The vessels of that day were like the yards—small, carrying from fifteen to twenty thousand to a load, and could not be kept going steady. As before mentioned, there was money to be made, and those who could scrape together a few hundred dollars invested it. Larger yards and more of them, with the demand increasing, called for boats of larger tonnage, from thirty to forty thousand. The brickmaker of that day did not inquire of the captain when he came to the yard to see if he could get a freight, if his vessel carried her load on deck, as his brother in the trade a few years later was sure to do. It was a case of live and let live between the brickmaker and the vessel owner. As the brickmaker did not have enough money to own his own boat he gave freight to outsiders. The captains of the vessels thought that if they did not put a number of thousand brick in the hold of the vessel she would upset. It would take some time for a man to wheel his barrow of brick on board, set it down alongside the hatch, then toss it off to the man in the hold, as he had to stow them. Time was not worth as much money in those days as it is now.

—Brick Barges, Past and Present.—

Another class of boats made its appearance in the fifties. About '54 the firm of Peck & Briggs, with a man by the name of Buchanan, built a sloop and named her after the bird of freedom. Competition was great among the vessels. She was built to carry about sixty thousand, and all on deck. As well as the best sailer on the river, she was Haverstraw's pride. After many years' service she was sold, to go to Galveston, Texas, was reported once off the Florida coast, but never reached her destination—lost, with all on board. When she was launched the cry was, you will never be able to sell such a large cargo; what will you do with her? From that date the class of boats have been on an increase in size, and I never have heard that the cargo could not be disposed of because it was too large.

The trade having reached a basis, so to speak, that the brickmaker had more money than he knew what to do with, he made a change in the running of the yard to produce more brick, and other changes to his benefit. He also became part owner of the vessels that took his stock to market, and, having made money, he built a class of vessels which could not be beat as regards speed and beauty, as well as size. As before mentioned, twenty, forty, sixty thousand had been the steps at which they advanced; now they made a stride further in boats. They were made so they would carry from seventy-five to a hundred thousand brick, all on deck, and drawing about six and a half feet of water, so that they would not lay aground at the yard for a week at a stretch when the tides were poor. The cost was not considered; the best was wanted, and it required a well-built boat to last in the trade when seventy-five to a hundred thousand brick are piled on a boat's deck and have them lay hard and fast on a hard bottom; it

tries them. The cost of each was from twelve to fifteen thousand dollars, according to size.

—Happy Days Gone By.—

Brick were selling freely at a good round price. The vessels would make from seventy to eighty trips during the season, and were money-makers from the start; thus they were not long paying for themselves. That day has passed, and if any of your readers had the pleasure of being in Haverstraw Bay when all the brick were carried by sail craft, and the high tide came about 6 o'clock in the evening, with a good south-east wind blowing, and see from forty to sixty vessels swing off and start off to the east shore, it was a sight never to be forgotten, each captain doing his best to beat, and, the wind being ahead, it brought out all their abilities as sailing masters. In some cases they knew where they were going to discharge cargo, and that others in the fleet were bound for the same place. They knew that if the other fellow got in first it meant a day's time lost to him. If the wind held, they would be in New York before daylight. If they got a place to discharge, the morning of the following day would see them back to the yard to load. I call to mind where a vessel was loaded at noon on Saturday and left the yard with the wind northwest, and was back at the yard at 3 o'clock Sunday morning. It was night-and-day work. All this is a thing of the past, never to return. Many think that with the departure of the sailing vessel the trade went to the dogs.

About the end of the sixties, when the call for boats to carry brick was brisk, and anything in the shape of a boat could get freight, Mr. John C. Rose, the deceased brickmaker of Roseton, was freighting brick with a canal boat. He took the risk and built at Rondout, N. Y., the first barge, called the S. S. Mackey, to carry one hundred and fifty thousand brick. Would she be a success—how are you going to steer her? Well, to make sure, they put on two rudders. All such questions were put to him, and he solved them all. She was a money-maker from the word go, and was quickly followed by others of the same capacity, but not owned by brickmakers. It was strange that, when there was a mint of money in barges, the brickmaker did not have any interest in them, but left others reap the benefit; but when he did take hold, he did it for all there was in it. He would not let anyone have a share. The sailing vessel was completely driven out of the trade.

The size of the barges at present engaged in the transportation of brick tends to increase. As a money-maker, if they can be kept going, they cannot be beat. As a handy way of carrying brick they cannot be improved upon. When one sees brick piled twenty high on a vessel, or nearly seven feet high, it goes to show that it is only the men who stow the brick will cause any detention in loading, as it is a solid tier of brick—no turning of heads, only on the outside. When the American Eagle was launched, it was said she cost about six thousand dollars and would carry nearly sixty thousand; the next size barge costs from twelve to fifteen thousand. At the present time there is being built at Newburg, for parties near Albany, a barge to carry three hundred and fifty thousand brick, or seventeen times larger than the first class, six times larger than the next, three and a half times than the third, and will cost about half as much. With the limit not reached, is it any wonder that the market can show acres of brick when they lay alongside of the dock, thirty or forty at a time? The fleet of sailing vessels was pleasing to look at; the barge is nothing if not ungainly in looks.

—The Market—

Remains about the same—all they want and some left over. If one section holds back, another seems to fill up the gap by increased shipments. The closing of the yards on the 18th of September, as mentioned last month, did not materialize as looked for. There were some who stopped before that date, simply because they had no more room to set brick, and they could not see where they could benefit themselves by shipping and putting more in.

The first of October is at hand; prices remain as last reported from \$3.50 lowest, to \$4.62½ high, and many yards closed. Whether the rate will remain the same to the close of the season, the manufacturer is the one to say. If he holds back, there must be an advance; if he ships freely the market will react. Beyond a question there are some who must ship, for what can they do if obligations must be met with stock under shed?

A. N. OLDTIMER.

Hackensack, September 29, 1897.

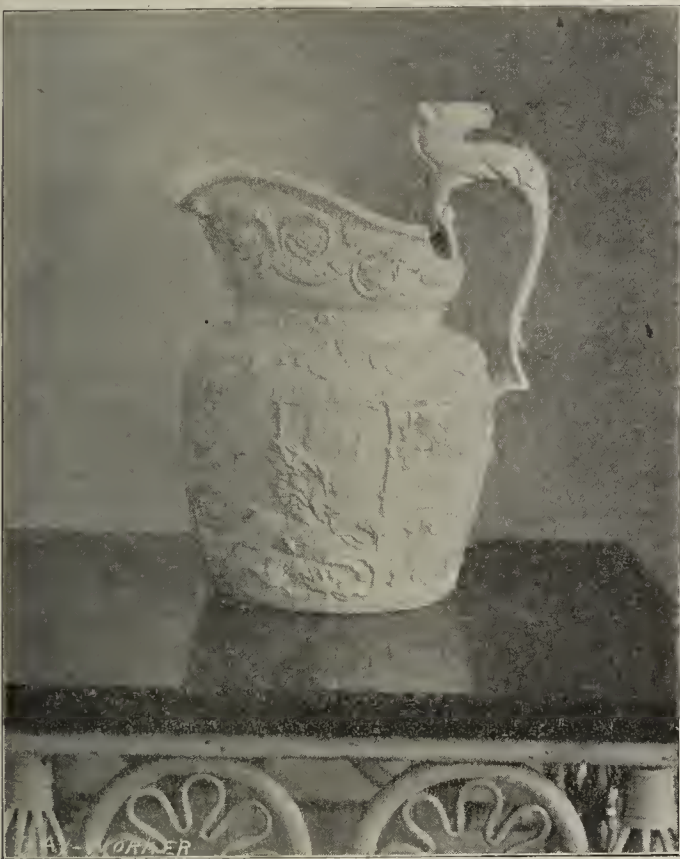
REMARKABLE ILLUSTRATIVE PITCHERS. No. 2.

BY MRS. MARY E. NEALY.

TAM O'SHANTER, PITCHER. 1835. A HANDSOME large ice water pitcher, of Rockingham ware. It was made in Hanley in 1835, and is of a strong bluish lavender paste, with the decoration entirely in relief. This consists of beautifully modelled pictures of the different scenes in Burns's Tam o' Shanter. Every one has read this remarkable poem, so that the story need not be repeated in full. Commencing at the right side of the handle and continuing toward the left one may read of Tam's entrance from the cold, and warming his hands at the blazing fire, of himself and the landlady growing quite "gracious" to each other, and of himself and "Souter Johny" drinking together.

"Tam lo'ed him like a vera brither,
They had been fou' for weeks thegither."

The scene at Alloway kirk is omitted, for a very good reason. There is no room for it upon the pitcher. It is something like the family picture of the Primroses in the "Vicar of Wakefield." But it is a scene so born of imagination and



beer that one can do just as well without it and take the other half of the story, which is told by the artist to perfection, and by the poet even better. After apostrophising and threatening the poor drunken wight, he continues,

"In vain thy Kate awaits thy comin'!
Kate soon will be a wofu' woman!"

Then came the pursuit of the witches.

"Now, do thy speedy utmost, Meg,
And win the key-stane o' the brig;
There at them thou thy tail may toss,—
A running stream they dare na' cross.
But ere the key-stane she could make,
The fient a tail she had to shake!
For Nannie, far before the rest,
Hard upon noble Maggie prest,
And flew at Tam wi' furious ettle;
But little wist she Maggie's mettle;—
Ae spring brought aff her master hale,
But left behind her ain gray tail!
The carlin claut her by the rump,
And left poor Maggie scarce a stump!"

Everybody who knows anything about witches, knows that they can not cross a stream of running water, so, although she did not get the sinner, Tam, she got the long gray tail of his faithful mare. This fact has evidently inspired the artist, for if you will but notice the beautiful pitcher closely, you will find that the very artistic handle is composed of the tail of the

immortal Meg, clasped in the hand of the plump young witch, Nannie.

The circle which crowns the embossed poem is a rich relief wreath of thistles, and the entire piece savors of the "land o' cakes" and of Burns. Such a piece of china is a valuable heirloom in a family. This is the impressed mark:

"Published by
W. Ridgway & Co., Hanley, October 1, 1835."



OFFICIAL ANNOUNCEMENT.

Pittsburgh the Place, February 15-18 the Time,
for the Twelfth Annual Convention of the National
Brick Manufacturers' Association.

To the Members of the N. B. M. A.:

IT IS with much gratification that we submit the accompanying invitation from the brickmakers of Pittsburgh, Pa., to hold our next yearly meeting in that city. Much the same conditions now prevail that made the choice of Buffalo so satisfactory last year. For this reason it seems equally necessary to again hold our Convention at a point most easily reached by a large majority of our members. Pittsburgh's central location offers this advantage, and as her brickmakers, who have taken an active part in our work for years past, are now again organized and unitedly desire to welcome us to their city, we deem it best to meet there Tuesday, February 15, 1898.

In arriving at this conclusion, we are not unmindful of our obligations to the New England members, who have been so faithful in attendance at every Convention during the past decade, and who have so cordially urged us to come and partake of their hospitality. We take this opportunity to thank them for their invitations, and assure them that we look forward with pleasant anticipations to the time when conditions will justify their acceptance.

In due time arrangements will be made as usual for reduced railroad rates, hotel accommodations, etc., etc., which will be fully set forth in subsequent announcements.

THE EXECUTIVE COMMITTEE.

By W. H. BRUSH, President.

T. A. RANDALL, Secretary.

—Pittsburgh's Invitation.—

To the Executive Committee of the National Brick Manufacturers' Association:

Gentlemen—At a called meeting of the brick manufacturers of Pittsburgh and vicinity it was unanimously voted to extend to your honorable body an urgent invitation to hold your next annual Convention in this city, and your humble servant was appointed chairman of the committee to look after the matter and complete arrangements for a Convention, if our invitation is accepted. We believe that Pittsburgh offers unrivaled facilities for Convention purposes, its central location and splendid railroad facilities enabling many to gather here from points East and West, North and South, who cannot be prevailed upon to go to cities less easily reached.

On our part, we promise, to a man, to do everything in our power to make the Convention a success. Believe from past experiences that we can make it very interesting for the members of the N. B. M. A., and promise a most cordial welcome to each and every brother brickmaker who will come within our gates.

Trusting that you will do us the honor to accept our invitation, we are

Fraternally yours to command,

GRANT DIBERT,

Chairman Committee on Entertainment.

Pittsburgh, Pa., October 12, 1897.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Cheap Buyers the Most Exacting—As Others See Us—A Tribute to Gates.

My Dear Editor:

It is a well established fact with brick manufacturers of the present day that when the demand is much smaller than the supply of manufactured material, and when as at present, prices and terms are fixed by the purchaser, the quality of material must be far superior to that insisted upon when the conditions are reversed, and the seller has a voice in the transaction. Reasoning from analogy, the readers of the "Clay-Worker" doubtless insist on the best possible product from an intelligent and practical standpoint during the existence of the present over stocked market of ideas and theories. I am led to this conclusion on reading your September number, and its pages are strong evidence that you have felt the necessity for improvement in your work. Inasmuch as it is one of the exceptionable numbers, in that it does not contain a single word from my pen, I am led to wonder if in some measure the improvement is not partially due to this fact.

In a general way I am very much pleased with the article by "Fax," descriptive of the new Home for the Friendless in this city. It is indeed a beautiful building, and will long be a monument to three noble men who furnished the money for its erection, the self-sacrificing women who compose its board of trustees, and the architect who planned and superintended the building. While it is doubtful if any of them will ever see this slight tribute to their philanthropic efforts, I would be glad to have the committee who had charge of the furnishing hear some of the criticisms I have heard on the green shades with which they have furnished this beautiful brown building. Further comment is unnecessary.

One little slip of Fax's pen ought to be corrected. He conveys the idea that the face brick used in this building are "seconds, or cull paving brick." No brick that we ever furnished were selected with more care than those in question. They are a small common brick, $2\frac{1}{4} \times 3\frac{3}{4} \times 7\frac{1}{2}$, with square corners, and are really identical with what were designed as No. 1 standard pavers of the vintage of about 1891. They were christened as "Continentials," and are known by that name to the trade. Their use was simply the practical application of an esthetic idea of Mr. C. S. Frost, one of Chicago's best architects. The one thing he was fearful of was that their appearance would be spoilt by efflorescence, and he almost decided not to use them because I would not guarantee them absolute immunity from this defect. I am pleased to say that they have gone through the first year in this and numerous other buildings without an indication of efflorescence.

Since writing the above I have been re-reading the September number, and want to emphasize its many points of excellence. It has, however, occurred to me that the article on Milwaukee brick making, which I more than half suspect was written by yourself, ought to have been paid for by Cunningham & Simpson, about in the proportion of two for Cunningham and one for Simpson, though they would get no more than they deserve if this amount of advertising was furnished them gratuitously. By the way, why is it that these enterprising Milwaukee brick makers are so seldom represented at our annual conventions? Their position in the fraternity is almost unique, and after overcoming the difficulties met with in burning Milwaukee clay, the victors should be willing to tell us how it was done.

"Gates' little Button Hole Talks" are always gems in a

literary way, and he usually manages to sandwich in some practical lesson, the point of which is easily seen even by a blind man. The gentle insinuation that all efforts of the Chicago brick makers to raise price have proven futile, and that we still give away our product is fully appreciated only by those who are hit. His sarcasms, while sometimes sharp, never leave a sting, and however much we may differ from him we have such an admiration for the choice way he dishes up the English language that we are always sorry if we disagree with him. There is but one Gates, but that one comes nearer my ideal of the perfect gentleman than any other man of my acquaintance. I want very much to write his obituary, but I don't want to do it for at least fifty years. At the end of that time, I will begin it, and begin it with hopes that it will be ready for publication before Prof. Orton's report on paying brick tests is. I wish I could guarantee that anything I could write would be as interesting and entertaining to the readers as I know this report will be when it is completed. If this letter does not spoil your October number I'll miss my guess. Yours,

D. V. P.

Chicago, September 29, 1897.

That Down Draft Water Grate.

Editor Clay-Worker:

The plan for a boiler given on page 540 of Clay-Worker for June has some points of interest that have not been noticed as yet.

I find from correspondence that the illustration is not right, but that the brick wall, D, under the grate should be set farther forward, say about the middle of the grate bars.

This arrangement makes the plan much more easily understood and shows how the down draft through the back part of the grate is accomplished.

The inventor's idea of generating the gases, or volatilizing the hydro-carbons of the coal on the front of the grate is good.

His plan is to push the glowing coals to the back half of the grate and then pass the gases from the fresh coal in front down through this bed of hot coals by a down draft through the back half of the grate. In this he is using a plan for smoke consumption that is employed in many smoke consuming furnaces, viz.: to bring the gases from the fresh coal into contact with some red hot substance and thus keep their temperature up until they can unite with the air and be consumed.

Of course this arrangement requires that all combustion be completed on the grates, for as soon as any gases that are passing down through the fire by the down draft, come in contact with the grates they become cooled below the temperature of combustion and pass away not burned. It is probable that much of the solid carbon that is pushed to the back half of the grate surface is only half consumed and passes away as carbon mon-oxide.

These water grates, with their relatively cool surfaces between the fire and the chimney, check or practically stop the burning of the gases and thus prevent the benefits to be derived from the use of the combustion chamber at the back and end of the grates.

The utility of the combustion chamber may be seen when we remember that as soon as the volatile parts of the fuel become heated they volatilize or turn to gas and start for the chimney with the draft, and as soon as each atom of solid carbon has met and united with one atom of oxygen from the air admitted into the furnace it becomes a gas and also starts for the chimney.

The volatile parts are carrying all of their heat with them, while the carbon mon-oxide is carrying more than one-half that might be obtained from it if properly burned.

When 12 grams of carbon are burned with 16 grams of oxygen to form 28 grams of carbonic oxide 25,000 units of heat are evolved, but when another 16 grams of oxygen are taken up and carbon dioxide is formed 44,000 more units of heat are produced. Of course a part of the solid carbon will be completely burned before it comes in contact with the water grate, but not all. Time and space must be given for the air to become thoroughly mixed with the gases in order that they may unite in combustion. Very little opportunity will be given from the time the carbon on the grate becomes a gas as carbon mon-oxide until it has passed down to the water grate, where it will become too cold for combustion. The hydro-carbons or volatile gases coming from the fresh coal in front might be burned above the fire, but a very poor opportunity is given for the proper mixing of the air and gases in passing down into the bed of coals.

Another serious objection that I see to this plan is to be found in the front half of the grates. The grates contain

water, in fact are a part of the boiler. The cold air coming into the furnace passes up between the pipes of the front half and takes heat from them since they contain warm water of the boiler.

The object of the furnace is to give all the heat possible to the boiler, while with this arrangement heat is taken from the boiler and carried to the furnace by the current of air coming into the furnace up through the front half of the grate surface.

Mr. Waplington has called attention to the fatal objection of lack of circulation of the water in horizontal pipes.

D. W. STOOKEY.

From Way Down in Maine.

Editor Clay-Worker:

The shortest season, the poorest season and the least output of any season in the brickmaking history of Brewer was the season of 1897. Four yards begun striking in June. Two yards quit the middle of August, the third yard finished September 23d, the fourth alone holds out until October. William Burk's output was 600,000, S. A. Holyoke's 600,000, Aaron H. Gould's 800,000 and Hugh O'Brien's about 1,500,000. For the first season in at least seventy-five years no brick have been made in South Brewer. The South Brewer output in years past was from 1,000,000 to 3,000,000 a year. The season opened without a promise. No market, no prospect, no weather, no encouragement, except that confidence was coming. Confidence seems to have been preceded by a water man. Prices ranged from \$5.50 up and down lot in the spring to \$4.75 now. Wages were about the average, though its season was short; \$32 and board to ordinary hands was the ruling scale.

John Flannigan and James Toole made Gould's brick on contract at \$2 per thousand, set in the kiln. They cleared up a profit of over \$1,200 for less than four months work. They are consequently the bonanza kings of the Penobscot and Klondike does not lure them to any extent.

Three yards were operated in the town of Penobscot, giving employment to eleven men. The output will be about 2,400,000. Wages for ordinary hands were \$26 a month and board. The bricks are sold in Boston and shipped by vessel. Prices are below cost of manufacturing at present.

Three yards were run in Orland this year, employing sixteen men. The output will be 2,500,000 to 3,000,000. Wages, \$26 a month and board. The market, in Boston and Maine coast towns. Prices the lowest known. The manufacturers look for higher prices in early spring and will hold their stock until then. A. B. & A. W. Hutchins are the largest operators. They have two 500,000 kilns ready for burning.

Only one of the two yards was operated in Ellsworth this year, the output being about 500,000. Brick sold fairly well in Bar Harbor and bay coast towns. Prices about \$5.50. Wages of men \$30 per month and board.

In Sullivan, near Bar Harbor, Patten's crew made about 400,000. Wages of men \$30 a month and board. Brick only \$5.50 and \$5.75 per thousand. The season was the worst ever known in Sullivan. Only 8,000 were struck in June. Mr. Patten's crew mercifully and without request gave up their June wages, simply asking for their board. This voluntary relinquishment of legal rights through feelings of pure justice is without a parallel in the history of brickmaking, in Maine at least. The brick business is not a business of strikes as a rule, but Mr. Patten's crew is the first to voluntarily share in the losses of their employer.

The entire product of Hancock county brick yards this year will fall short of 5,000,000. In 1880 Orland alone manufactured more than 10,000,000 and Penobscot must have produced at least 12,000,000 in that year. Those palmy days are undoubtedly gone for good.

B. J. D.

Terra Cotta vs. Concrete.

To the Editor of the Clay-Worker:

The debate between the advocates of terra cotta and concrete resembles the mighty competition of a circus and "side show." While one is considered a legitimate entertainment, the other is contented to be called a "side show," and gather its patronage by the lights which illuminate the mammoth tent. But when the circus moves, what happens?

"Peace be to their ashes" seems a peculiar fitting blessing for the advocates of both these systems. Yet could either be subjected to a thorough treatment of their respective methods, "ashes" would no longer express their future state, but in its place would be used terms of "terra cotta" or "concrete," and

if concrete dared hope for complete converts "ashes" would become obsolete.

Thoughtfully, what lesson has been taught by the Pittsburg fire, from which this lengthy argument got its initial momentum? Simply that terra cotta did all that was claimed for it; that no other system ever had such a test; that concrete, where used in a building with a fire that is commonly called a "blaze," protected by wind, time, isolation and the whole fire department, showed unusual weakness, and that the architects having the restoration of the Home Store Building in charge are satisfied with the test, and are to use terra cotta for the reconstruction, and that the weakness shown by the concrete with this incipient fire displayed its faults, and none of its advocates would have cared to have had a general inspection immediately after the fire, as such would have caused a lasting injury.

It has shown one thing, however, and that is the shrewdness of the business men who have taken to the advocating of concrete as a business venture. Many, to read their letters to-day, and not knowing the facts relative to this Pittsburg fire, would suppose that all this contention originated from equal tests in an actual fire. They have created among the laymen whom they defend the impression that their system has actually demonstrated fire-resisting qualities under a severe trial.

There have been many reports from chiefs of several different professions—engineers, fire underwriters, building experts and fire-proofing concerns—and all agree that terra cotta was eminently successful. The last report, however, made by a commission of capable engineers and sent to adjust the loss, to condemn all the seriously injured steel and suggest means of using that which has received slight injury, and approve that which was considered proper to stand, after thorough inspection, is to the effect that all iron work not displaced or deformed by the falling of an immense water tank was not seriously enough injured to require removal. Then comes the crumb from which the concrete advocates try and feed the multitude. These same engineers, after making so favorable a report, suggest that some other system should be adopted to more thoroughly protect the steel from heat and consequent expansion, and recommend concrete. Why a change if the steel is all right? Why concrete, even though a change be desirable? This fire demonstrated no qualities for concrete, but, instead, quite the reverse. Where were the weak points of protection to the steel where the construction was with terra cotta? Not where terra cotta was used, but where it was admitted. If more protection for the steel is needed, why not more terra cotta? This material has stood the test in the worst conflagration known for years, and why change for one that an ordinary fire so completely injured that it should and probably will be replaced?

Terra cotta is still supreme, and concrete will have to prove further than a simple claim that it stands within "hailing distance" of this superior material. Cannot the users, builders and owners see for themselves whether claims are set forth for terra cotta that it cannot fulfill as well as any body of men whose trade or profession is as distinctly different from fire-proofing as dry goods are from groceries? Concrete has been too long in the field not to have known its qualities, and nothing new has been added to it that makes it better to-day for fire-proofing than many years ago.

H. H. FERNALD.

The Situation in Chicago.

Editor Clay-Worker:

Every day that comes seems to bring with it new evidences of improvement in general business. All thoughtful business men have words of good cheer concerning the change in the business situation.

Business is constantly gaining in volume, and all lines of trade have a greater or less improvement, while some never were more prosperous. Of course, the one thing above others that makes the West rejoice is the undisputable fact that we have an enormous supply of wheat on hand and moving towards the sea, as well as the best of prospects for large and bountiful crops to be harvested in this and other lines of food supplies. The fact that the many millions of gold dollars are to fall and are falling into the hands of Western farmers, and that they will continue to do so for many months to come, makes assurance doubly sure that the increase in prosperity of all lines must grow more and more.

The Economist, in a late issue, states: "The Chicago real estate market has reached a position where hope should take the place of discouragement. There is good ground for the opinion that the bottom has been touched, and that in the course of a year or so we shall have some activity. Indeed, there is a slight turn for the better already. The demand for down-town offices has improved, and there is a little more inquiry for various classes of property from investors and spec-

ulators. But that is the extent of the gain so far. It rouses the ire of the average real estate man to remark to him that business is good, for he thinks that possibly it may be good with some of his fellow-brokers or operators, and, not being in the same luck himself, he is irritated to hear such expressions. It is not too much to expect that considerable increase in certain lines of the business will be shown this fall, and that next spring the trade will be fairly satisfactory. While the market has been getting deeper and deeper in its depression, the population of the city has been increasing, capitalists have been saving up money for an emergency, liquidation has been strengthening the general situation, and confidence has returned to a certain extent with the revival in other lines of business. Pretty soon the great mass of the people will have some money laid by, and they will want to purchase lots. Thus the market will grow little by little, and we shall get back to a normal trade."

There are many improvements being made on State street that will add much to the attractiveness of this principal retail thoroughfare of the city. There is a strong rivalry among its merchants to excel each other in the design of the facades of their buildings.

Mandel Brothers have changed the first and second stories of their building under designs by Jenney & Mundie, architects. The work is done, and the improvements, with their rich decorations, are such as to attract the attention and admiration of all passers-by.

Charles A. Stevens, the celebrated silk merchant, has also made striking improvements in his property, expending about \$50,000 in enlarging, improving and beautifying his establishment.

The most interesting event in the building line on the street, however, is the completion of The Fair, one of the largest retail establishments in the world. The building is nine stories high and covers a frontage of 190 feet on State and on Dearborn streets, and 343 feet on Adams street. The cost was about \$1,250,000.

The McCormick Harvesting Company is constructing a new foundry, machine shop and boiler house at Western and Blue Island avenues. The buildings will cost \$100,000.

A canvass among the architects shows a decided improvement in prospective building, and many important projects will doubtless go ahead this fall or in the early spring. There are mercantile and office buildings and apartment houses embodied in plans which are now being made that give evidence of an increase in new buildings.

Owners and investors are undoubtedly inclined, where it is possible for them to do so, to take advantage of the present low prices of materials. Common building brick are now being sold and delivered at \$3.50 to \$4 for 1,000. Pressed brick of a very good quality can be had at \$8 to \$10 for reds, and \$14 to \$25 for buffs and other colors.

In most other lines relating to building, correspondingly low prices prevail as a rule. There have been advances made in prices of plumbing goods and pipe fittings.

Building operations continue to be disappointing in number of new structures and the amount of estimated cost, and owing to the advanced season there is now very little prospect that the building activity of the present year will reach that of 1896, or, in fact, of any preceding year since 1890. The number of new structures for which permits were issued, and the amount of estimated cost for the same, within the period mentioned was for nine months as follows:

	Number.	Cost.
1890.....	8,961	\$36,546,800
1891.....	9,280	39,309,600
1892.....	8,395	50,958,560
1893.....	7,214	24,117,335
1894.....	7,978	27,323,980
1895.....	6,629	30,016,319
1896.....	5,360	20,069,060
1897.....	3,930	17,121,338

Statistics of building operations in the various cities of the country are always an interesting study, says the American Contractor. Optimistic editors revel in word-pictures of Utopian prosperity and contentment in their columns, but the sensible mortal looks at the figures before rendering an opinion.

Building construction has not proved itself the first industry in the land to feel the throb and pulsation of new life and vitality. While it is, generally speaking, a true statement that the building operations of the United States reflect the degree of prosperity which we are enjoying, this proposition is far from being literally true to-day.

The average increase of bank clearings during the last thirty days, as compared with a year ago, has been very large, and they do, as a matter of fact, reflect the increased commercial activity of the 72,000,000 of people of this Republic. But the statistics of building operations for July of 1896 and of 1897 respectively tell a very different story.

Within eight months the increased and continually increasing business being done will result in an imperative and immediate demand for more warehouses, more office structures, more business buildings, and increased facilities of every kind to handle it. Business men who during the late depression have been occupying small and cramped quarters (which, by the way, were ample for their dwindling trade) will move back into their former larger establishments, and greater business structures will be reared to accommodate those who come to handle the increasing volume of trade. To house them and their families will be the next consideration, and the erection of dwellings, apartment buildings, family hotels and flats will be energetically pushed ahead.

The period of largely increased building construction will begin next March—about eight months after the first spurt of this new era of prosperity. We have in this country, without resource to English or German capital, hundreds of millions of wealth which will rush into the West for investment in building enterprises as soon as the present holdings in the line of business property begin to pay 2 or 3 per cent. more than at present. This change will be a quick and eloquent pointer to the Atlantic States' capitalists that they can duplicate their investments with profitable results in the cities where they are already proprietors. Caution and prudence have always attended the management of capital when in sagacious hands. Our Eastern capitalists are much richer to-day than they were in the latter eighties, when the big booms were in Kansas City, Omaha, Minneapolis and St. Paul. These shrewd and careful Easterners dropped very little of their wealth when the great crashes of '93 and '96 struck the country. On the other hand, they have been piling up money, many of them, at a phenomenal rate.

A part of this vast wealth will find its way into the construction of buildings in the great cities of the Mississippi Valley as soon as the conditions justify the investment. The co-operation of these Easterners is well worth cultivating. They are as essential to the energetic and ambitious young man of the West as the latter are to the former.

TEMPERED CLAY.

Good Location for Clay Works.

Editor Clay-Worker:

It may be of interest to some people to know that in this vicinity there are many deposits of kaolin or aluminous clay. Some of these deposits are known to be hundreds of acres in extent, while others have been tested only in depth and not in area. The depth of these deposits has been found to be from fifteen to forty feet. The history of the formation of these clays and the uses to which they can be applied is given by Prof. R. H. Loughridge, Ph. D., in his report of the geological survey of Western Kentucky, and they are mentioned as clays of a very useful character.

Clays from some of these deposits was sent to the factory of the Decorative Art in Terra Cotta, etc., in Cincinnati, and in writing of these clays afterward, Mr. Karl Langenbeck, of that factory, said, "Speaking in regard to the establishment of a pottery for making regular table ware, cups, saucers, plates, bowls, pitchers, etc., I think it would be a very paying thing, because you have raw material equal to the finest in England. The practical experience I have had with the clay of this district has taught me their peculiarities, and I can freely say, that from their great plasticity, they are most easily and cheaply worked, and from their binding qualities, entail less loss in the kiln than any others I have ever met with. Some of these clays with the addition of some flint, make a very beautiful ivory ware almost exactly resembling that made by the celebrated firm of Copeland & Sons, in England, for table and toilet sets." The writer has had some of these clays tested, and while no regular report of them has been made, yet they have been pronounced most excellent clay for anything. Aside from a few jug and jar factories, there is nothing manufactured from clay in this vicinity. It is known that these clays make the best encaustic tile for walks and floors, ornamental pottery and terra cotta and many other articles which are made of clay. A plant for such manufacturing here would have no competitors nearer than 250 miles.

Mayfield, Ky.

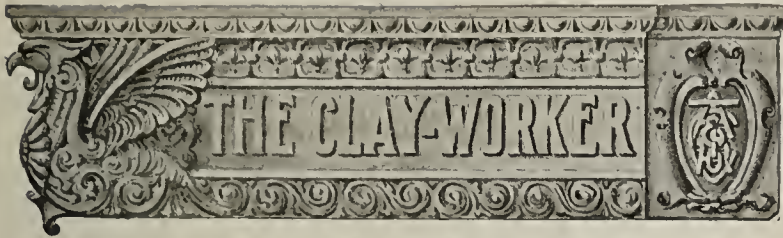
B. A. NEALE.

Not a Brickmaker, but a Brick User.

Publisher Clay-Worker:

Please find enclosed a draft for \$2, renewing my subscription for the Clay-Worker. I have no interest in the manufacture of brick, but am directly connected with the use of brick in buildings. The many excellent articles which appear in the Clay-Worker from month to month is an inducement for those outside of the brickmaking craft to subscribe for the Clay-Worker. Respectfully yours,

WM. CORBETT.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " " " " " "	10.00
Ten copies, " " " " " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVIII. OCTOBER 1897. No 4.

CURRENT COMMENT.

The most important event of the month to paving-brick manufacturers is the publication in book form of the Report of the Paving Brick Commission. It is a very valuable work, a copy of which should be put into the hands of every city engineer.

* * *

All hail, Jack Frost! and may you speedily drive "Yellow Jack" far beyond our borders. The plague, though of a mild type, has wrought much misery and damage throughout the Gulf region, though, so far as we have heard, no representative clayworker has suffered direct loss.

* * *

Our correspondent at Nashville writes that the yellow fever scare has not interfered with the attendance at the Exposition to any great extent. The show is now at its best, and large crowds are anticipated till the Centennial closes on the 30th inst., with fitting ceremonies. The Exposition has been a success in every way.

* * *

The Executive Committee of the N. B. M. A. have chosen wisely in accepting the invitation to hold the next National Convention in Pittsburgh. The Iron City offers the same advantages geographically as did Buffalo. Her brickmakers are up-to-date, and will make it very interesting for all who attend. "There'll be a hot time in the old town" February 15-18, 1898.

* * *

As will be seen by mention in another column, the School for Clayworkers begins its fourth year very auspiciously. There is a gratifying increase in the number of pupils, nine different States being represented. Prof. Orton writes that the school authorities have been obliged to build additional laboratory desks in the chemical department to provide for the new pupils, all of whom take up the work with an enthusiasm

that augurs well, both for themselves and the school. Our readers will hear more of this class later on.

* * *

We appreciate the many compliments passed upon our September issue, which seems to have "struck a popular chord," particularly with some of our older readers. We doff our tile to our venerable friend, D. V. Purington, whose interesting letter on another page itself gainsays the intimation in same that he is a "back number."

* * *

Vice-President Brockway voices our sentiments when he says: "I think that Pittsburgh seems to be the most desirable point to hold our next Convention. New Haven, or Boston, would be my choice, if I studied nothing but my own interest, but I think we could not get so large an attendance at either of the latter places. I am looking forward for as good, if not a better, Convention than we have ever held."

* * *

Hon. Anthony Ittner, the well-known brick manufacturer of St. Louis, Mo., celebrated his sixtieth birthday the 8th of October. Writing us under that date, he says: "Notwithstanding my sixty years, I am still a young man in feeling, action and spirit, and I do not think I go far wrong when I say, if God spares me to my family and friends, there is yet twenty years of good, solid, active work in me." His innumerable friends throughout the country will answer back a hearty "So mote it be."

MUNICIPAL GOVERNMENT.

The most significant event of the month, though the least noticed, was the convention of city mayors at Columbus, Ohio, late last month. More than 2,000 had been invited, yet only a few hundred attended, but an association was formed, called "The League of American Municipalities," which is to meet annually and discuss the thousand and one questions involved in municipal government. If this can be done in the spirit of honest inquiry the best of results must follow. Manhood suffrage is the ideal American doctrine, but it is becoming more and more evident that the right to vote as a citizen of the State does not and ought not to imply the right to dictate in the management of municipal affairs which relate only to the management of the local business of the corporation. It transpires that a large majority of the voters at municipal elections usually pay no municipal or even State taxes. Whether they should dictate as to the disbursing of revenues they never contribute to will be one of the topics of discussion, as will be the municipal ownership of water, gas, electric light plants, street railroads and the like. We anticipate good results from this annual interchange of views.

OFFICIAL REPORT OF THE BUFFALO CONVENTION.

The report of the last annual convention of the N. B. M. A. has just been published in book form. Its issue has been delayed in order to include the Report of the Paving Brick Commission, which has but recently been completed. The report, as revised, makes a substantial book of 300 pages, the report of the Paving Brick Commission alone including nearly 100 pages of chart and tabular work, that represents a vast amount of exacting labor and scientific experiment. It is indeed a valuable work for the student in clayworking.

As these reports are issued year by year, the same thought comes to us—the advance which they represent in the clayworker's art. We have all been studying and thinking in concert, bringing our best ideas and our practical experience to these conventions, and the report of their proceedings have presented the result. Think of the progress from the sitting of the first convention to the adjournment of the eleventh annual convention, held in Buffalo. The printed reports of these conventions set forth this progress in a specific manner.

Those who will meet with the N. B. M. A. for the first time at its next yearly meeting should by all means obtain a copy

of this report and study it carefully. It will put them in touch with the spirit of the Association, and thus enable them to realize more from its deliberations than they can hope for without it. Any one wanting a copy is requested to address the Secretary, at Indianapolis.

PROSPERITY COME TO STAY.

The Clay-Worker has never joined in the contention that the phenomenal advance in the price of wheat is the cause or effect of the marked improvement in business. If that were all or even the chief cause there would be little to boast of or hope for. None who wish to know the truth and tell it, can be ignorant of the fact that in the wheat producing countries of the world which compete with ours the crop of last year and the year preceding were so much below their average that they were wholly inadequate to the demand in the markets they had so supplied of late, that we could not compete with them with wheat at more than about fifty cents, while at the same time our crops have been so abundant that our elevators and barns were full to overflowing. That we were prepared to supply this increased demand was fortunate, so far as the owners of the wheat was concerned, but beyond that the general public has partaken but remotely of the benefits of the increased price of this cereal. Increased wealth which comes of the misfortune of others is not to be coveted, hence a prosperity in business whose foundation is short crops in other wheat fields than our own, may soon be reversed by a short crop in our own fields, as the unprecedented drouth of this autumn during the wheat sowing season indicates as alarmingly near. The prosperity in which all rejoice has a broader, firmer foundation than the advance in the price of wheat, and it will not be affected by the probable short crop of next year, beyond the sympathy which every member of a body feels for every other member. It is seen in that return of confidence and hope which furnishes employment for labor in almost every industry in the land. True, all men and women have not employment. A great many do not want it, and many thousands will not have it except on terms that the common interests will not allow. True, also that the commercial value of a day's work may not be nominally what it was a few years ago, and may never be again, yet that the wheels of manufactures and commerce are again moving, and moving with increased momentum, no sane man will deny, and all wise men will adjust themselves to the new conditions, without wasting much time in theorizing as to the cause of this improvement. Let us congratulate the farmers that they had on hands a surplus of bread stuffs when this demand came, though our own bread costs more than it did. The money they are receiving from abroad will find its way into every pocket in time and all will be benefited by it.

REPORT OF THE PAVING BRICK COMMISSION.

The Report of the Paving Brick Commission appointed to investigate the subject of paving brick tests and to recommend methods for their conduct, is now in shape to be placed before the world. A review of this report for the readers of the Clay-Worker would appear out of place. All must review it for themselves. Each and every wide-awake brickmaker will digest this work to the limit of his individual capacity. It will be remembered that the Commission on Standard Tests for Paving Brick was appointed in February, 1895, and it was asked that the report be presented to the meeting in Atlanta, Ga., in December of 1895. The committee was wise enough to see its opportunity to do a great work in the interest of this paving material, and of brickmakers at large, and has fully performed its mission, for which all honor and credit is due Prof. Edward Orton, Jr., and his co-workers.

The commercial value of this work can not be estimated. It redounds to the interest of the clayworker and the commun-

ity at large. With its help the community will get better streets, and the clayworker will get more money, with the added consciousness of work well done. This work is a credit to the National Brick Manufacturers' Association. But for that organization the work would not have been done; not that it furnished the money—that is the least of it. It educated its members; it encouraged scientific investigation, the result of which is this text-book on paving brick tests. Paving brick manufacturers should see to it that a copy of this report is placed in the hands of every city engineer. If they fail to do this, they miss a golden opportunity to advance the cause of brick pavements.

HOW TO MAKE THE MOST OF OUR OPPORTUNITIES.

The Clay-Worker greatly rejoices over the many indications which reach it of returning prosperity in our own field. From the first we have thought to guard our readers against expecting too much all at once. Where this advice has been taken the best results have followed. We are specially gratified at the fulfillment of our predictions in the advice given a year to eighteen months ago, when utter ruin seemed to stare everybody in the face. Not a few of our advertisers became panic stricken and thought of practically withdrawing from business, by taking down their signs. Nothing could have been a greater blunder and as a faithful friend we were prompt to tell them that the crisis would pass and when prosperity returned they would not only have their respective plants in readiness to meet the demand for their goods, but they should keep their hands on their customers by keeping themselves before the brickmakers of the world, through our advertising columns. Fortunately for those who took our advice, they are "in the swim" already and are reaping a good harvest from their pluck and perseverance.

With the same unselfish regard for their welfare we now say the time has come to push things. When the wind is rising unfurl your sails and let it drive you into port, only don't be caught in the storm. No immediate danger of that now. Solomon was a close observer of business laws and he said, "There is that scattereth and yet increaseth," meaning, no doubt, that the man who has a good thing to sell advertises it extensively. Money "scattered" judiciously in advertising always increases, as many of our patrons know. The wise old king gave the other side of this business proverb when he said, "There is that withholdeth more than is meet and it tendeth to poverty." It is bad economy to make goods and store them. Sell them, then make more and sell them too. Those who have long and profitably used the advertising columns of the Clay-Worker need not be told that our advice is to use the best medium available. If some cheaper paper proposes to do your work for less and you are satisfied with low prices and small returns, try them, but by all means increase your advertising as times improve and thus improve your own business. Don't follow the procession, lead it, and in no way can you so successfully lead as by advertising freely. Many of our subscribers take our paper for the information they receive through our advertising columns as much as through our corps of able correspondents.

In a recent letter George T. Dickover, Wilkesbarre, Pa., the worthy Vice-President of the N. B. M. A., advises us that he will soon burn the last kiln on the old yard of Dickover & Son, at that place, when the yard will be closed and the firm will be dissolved, the elder Dickover retiring. Mr. George T. Dickover will continue in the business, having started a new yard. Referring to Convention matters, he adds: "I think that Pittsburgh, being the most central, is the best location for our next Convention, as we can get out a better attendance there than at either of the other places. For this reason I am in favor of Pittsburgh, though personally I would prefer either Boston or New Haven, as I would like to visit New England. I think February will best suit the most of our members. Send me some extra copies of the Convention Report, with bill for same. I wish to present copies to our city engineer and other city officials, where they will do the most good. It is a book of which we may all be very proud."

THE CERAMIC ASSOCIATION OF THE OHIO STATE UNIVERSITY.

The first meeting for this college year of the Ceramic Association of the State University was held in Orton Hall on the evening of October 1st. There was a good attendance and a good start was made in the year's work. Nine new names were presented for membership and thus the society is stronger than it has been at any time during its existence. Election of officers took place, with the following results: A. V. Bleining, president; A. B. Chandler, vice-president; A. R. Campbell, secretary and treasurer.

The meeting was characterized by considerable enthusiasm. It is proposed to make the organization one of the strongest among the scientific and technical societies of the University. Among other features a lecture course will be established, embracing lectures by prominent clayworkers who can be induced to come, and by professors and teachers of the University. Several gentlemen of high standing in clayworking circles have already accepted an invitation to lecture. The society enjoys the hearty co-operation of the director, Prof. Orton, Jr., and assistant director, Mr. Wm. L. Evans. A cordial welcome to attend the meetings is extended to all clayworkers who may come to Columbus.

AMERICAN IMPORTS AND EXPORTS OF BRICK AND CLAY.

The following exports of bricks and clay have just been completed for the month of July, the latest period for which the official figures have been compiled by the Treasury Department:

The amount of building brick exported in July amounted to 520 thousand, valued at \$3,333, against 252 thousand, valued at \$1,708 worth in July, 1896. The total for the seven months amounted to 2,807 thousand, valued at \$18,332, against 3,065 thousand, valued at \$19,253 worth in July, 1896.

Fire brick was exported from the United States to other countries to the value of \$7,042, against \$10,782 in July of 1896. The total for the seven months amounted to \$56,275, against \$44,480 worth last year.

The dutiable imports of clay for the month of July amounted to 7,923 tons, valued at \$53,938, against 6,362 tons, valued at \$44,931 worth imported last year. The total for the seven months amounted to 60,585 tons, valued at \$405,209, as compared with the imports of July 1896, which were 57,812 tons, valued at \$414,666.

The dutiable re-exports of clay are shown to be very small, 16 tons, valued at \$63, against 11 tons, valued at \$88 during the seven months of 1896. There were no re-exports during either month.

AN INDESTRUCTIBLE FIRE-PROOF BRICK.

Prof. A. R. Strachan has been experimenting with the fire clays found around Toledo, O., for a long time, says the Tidings, and at last he has hit upon a combination of clays that make an absolutely indestructible fire-proof brick. He has subjected it to a white heat that will melt solid rock and iron, and though wholly submerged in such a fire for a long time it came out totally unaffected. A thousand ordinary fire brick will weigh three or four tons. The bricks made from this combination of clays will weigh about one-sixth as much as ordinary fire brick. This is an important discovery. It will not be long until there will be a big demand for fire brick to line smelter furnaces, etc., in treating the ores from the surrounding mines. The cheapness and lightness of the burned brick will be an important item.—Exchange.

NOT SO REMARKABLE WHEN YOU COME TO THINK ABOUT IT.

A young lady in New York kneads bread with her gloves on. This is nothing great or out of the ordinary. We need bread with our pants on. We need bread with our boots on and goodness knows, if some of our subscribers who are in arrears do not soon pay up we will soon need bread without anything on. —Pottstown News.

TABLE OF CONTENTS.

American Architecture in Clay	261	CORRESPONDENCE:	
Brickmaking in Maine.....	262	Cheap Buyers the Most Exact-	
An Up-to-Date Brickmaker.....	263	ing—As Others See us—A Tri-	
"Kaolin" or "China Clay".....	264	bute to Gates	296
Modern Terra Cotta Construc-		That Down-Draft Water Grate	296
tion—How Good Work is		From Way Down in Maine.....	297
Marred Sometimes.....	264	Terra Cotta vs. Concrete	297
Brick Efflorescence.....	265	The Situation in Chicago	297
Historical Sketch of the Phoe-		Good Location for Clay Works	298
nixville (Pa.) Pottery.....	266	Not a Brickmaker, but a Brick	
Reliable Information	267	User	298
German Notes.....	268	News from Tide Water, Va.....	307
Button-Hole Talks.....	268	A Good Start—Room for More..	307
Clayworking in the Far North-		Pacific Coast News.....	308
west	269	Down in Jersey.....	308
Brickyard Experience.....	269	Among the Buckeyes	308
Higher Prices Mean Better		EDITORIAL:	
Times	269	Current Comment.....	299
An Idyll(er) in Terra Cotta	270	Municipal Government.....	299
In the Land of Promise	273	Official Report of the Buffalo	
Buckeye Plants—A great Sewer		Convention.....	299
Pipe and Fire Proofing Man-		Prosperity Come to Stay.....	300
ufactory.....	274	Report of the Paving Brick	
The Revival of the Potter's		Commission	300
Art	275	How to Make the Most of our	
The Development of Hollow		Opportunities	300
Block Manufacture.....	276	The Ceramic Association of	
An Old and Successful Fire-		the Ohio State University....	301
Brick Works. 1854-1897.....	278	American Imports and Exports	
Modern American Front Brick	279	of Brick and Clay.....	301
The Clayworking Industries of		Editorial Notes and Clippings..	304
Australia (No. 7).....	282	MISCELLANEOUS:	
Utilizing Waste Heat from		An Indestructible Fire-Proof	
the Kiln.....	283	Brick	301
How Many?.....	285	Not so Remarkable When you	
The New York Market.....	285	Come to Think About it.....	301
Remarkable Illustrative Pitch-		Decatur, January 5th and 6th ..	306
ers	287	The Perfect Clay Screen.....	306
Official Announcement	287		

Index to Advertisements on Next Page.

Books for...

Brickmakers.

"CLAY GLAZES AND ENAMELS,"	
Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	
Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	
J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	
Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	
H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	
J. J. W. Billingsley,	1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,
Indianapolis, Ind.

INDEX TO ADVERTISEMENTS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page
Progress Press Brick and Ma-		The Chisholm, Boyd & White Co.	
Machine Co.....	309	.....	256
Ross-Keller Brick Machine Co.	259	The American Clay-Working	
Simpson Brick Press Co.....	257	Machinery Co.....	324, 333
		The Fernholtz Brick Press Co.	258

Brick and Tile Machinery.

Anderson F'dry & Mach. Wks...	329	Stedman's Machine Works.....	321
Baird & Son, H. C.....	316	Steele, J. C., & Son.....	321
Brewer, H. & Co.....	318, 331	The American Clay-Working	
Central Machine Works.....	313	Machinery Co.....	324, 333
Chambers Brothers Co.....	253, 327	The Horton Mfg. Co.....	302
Chicago Brick Machinery Co ...	307	The Eastern Machinery Co.....	334
Eagle Iron Works.....	313	The Henry Martin Brick Mach.	
Freese, E. M. & Co.....	332	Mfg. Co.....	326
Frost Engine Co.....	323	The Leader Mfg. Co.....	327
Hensley, J. W.....	315	The Ohio Ceramic Engineering	
Kells & Sons.....	316	Co.....	254
Means & Co., Jas.....	313	The Wallace Mfg. Co.....	335
Michigan Brick and Tile Ma-		The Wellington Machine Co.....	305
chine Co.....	315	Williams Patent Crusher and	
Madden & Co.....	318	Pulverizer Co.....	324
Newell Universal Mill Co.....	325	Wiles, Co. A. M. & W. H.....	321
Potts & Co., C. & A.....	330	Woolley Foundry & Machine	
Raymond & Co., C. W.....	303	Works.....	326

Brick Kilns and Dryers.

Alsip, S. H.....	320	Phillips, S. G.....	319
Conley & Wolfe.....	322	Reppell, L. H.....	320
Cummer & Son Co, The F. D.....	309	Sharer, Geo. W.....	322
Eudaly, W. A.....	323	Swift, F. E.....	314
Hundt, F. & Co.....	312	The American Blower Co.....	311
Morrison & Co., R. B.....	323	The Fernholtz Brick Press Co...	258
Pike, E. M.....	312	The Standard Dry Kiln Co.....	260
		Wolff Dryer Co.....	336
		Yates, Alfred.....	312

Brick Yard Supplies.

Arnold, D. J. C.....	254	The Atlas Bolt & Screw Co.....	318
Coldewe & Co., G.....	317	The Buck Machine Company ...	316
Carnell, Geo.....	320	The Harrington & King Perfor-	
Cox, Geo. S.....	312	ating Co.....	255
Caldwell, H. W. & Son Co.....	311	The Henry Martin Brick Ma-	
Carmichael, T. W.....	318	chine Mfg. Co.....	326
Elder & Dunlap.....	310	The Keystone Brick-yard Sup-	
Marlon Steam Shovel Co.....	325	ply Company.....	314
Mey, F. H. C.....	312	The Pittsburg Mineral Screen	
Mershon & Co., W. B.....	255	Company.....	312
Newton, A. H.....	317	Wagoner, M. V. B.....	311
Phillips & McLaren.....	315	Walworth Run Foundry Co.....	311

Miscellaneous.

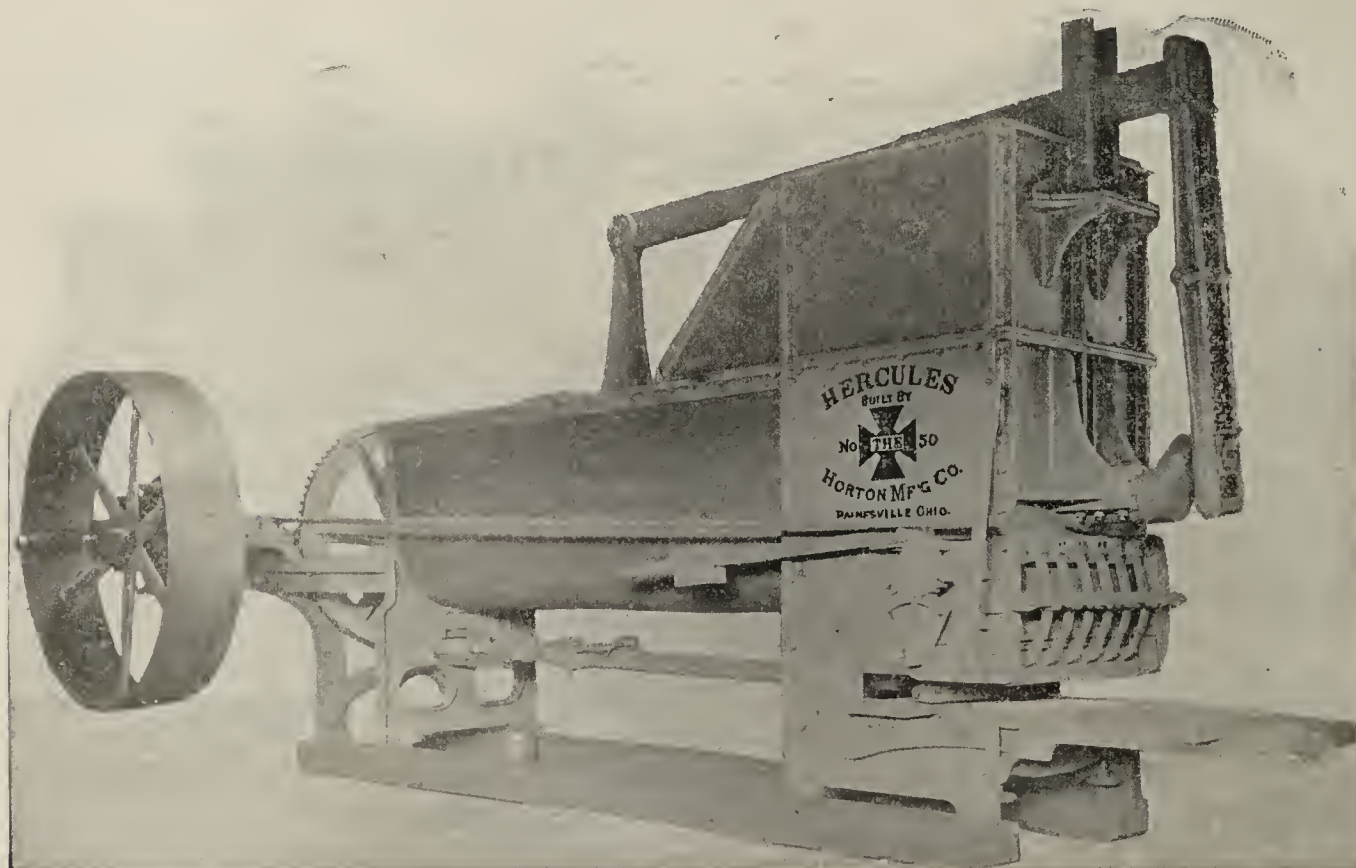
Associated Trade & Industrial		Illinois Central R. R.....	318
Press.....	314	Lake Erie & Western.....	316
Baird, Henry Carey & Co.....	315	Main Belting Co.....	314
Big Four R. R.....	318	Monon Route.....	317
Cincinnati, Hamilton & Day-		Osborne, W. R.....	313
ton R. R.....	319	Pennsylvania Lines.....	317
Chesapeake & Ohio R. R.....	312	Ropkey-Mason Engraving Co..	314
Cotton Belt Route.....	316	Tennille, A. F.....	316
Dean Bros. Steam Pump Works	313	The E. W. Vanduzen Co.....	315
Dover Fire Brick Co.....	316	The Union Hardware Co.....	317
Evens & Howard.....	315	The Jeffrey Manufacturing Co..	314
Gabriel & Schall.....	311	The Rockwood Mfg. Co.....	317
Geysbeek, S.....	310	Vandalia Line.....	318
International Correspondence		Westbrook & Wells.....	313
Schools.....	319	Small Ads., Wanted, For Sale, Etc	
Indiana, Decatur & Western ...	319		

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

HERCULES.

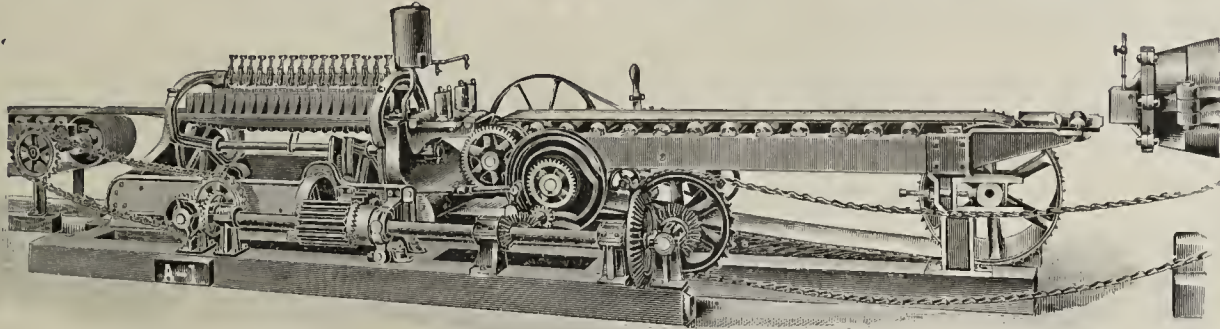


The Acme of Simplicity.

A Giant in Strength. Pug Mill and Machine combined. An Upright press that never wears. No leakage. Guaranteed to make 5,000 brick per hour.

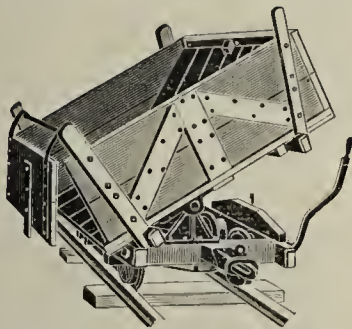
The Horton Mfg. Co.,
Painesville, Ohio.

Yes Sir-ree! We Make 'em all, We do!

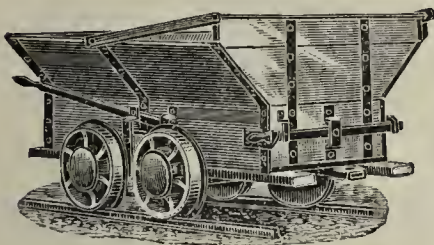


Automatic Side Cutting Table.

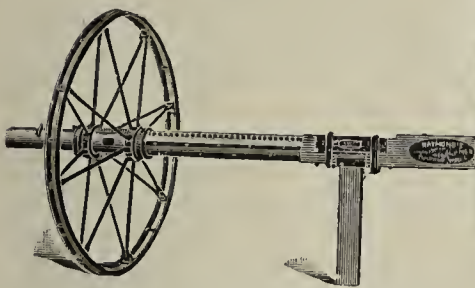
An' we make a whole lot more besides,



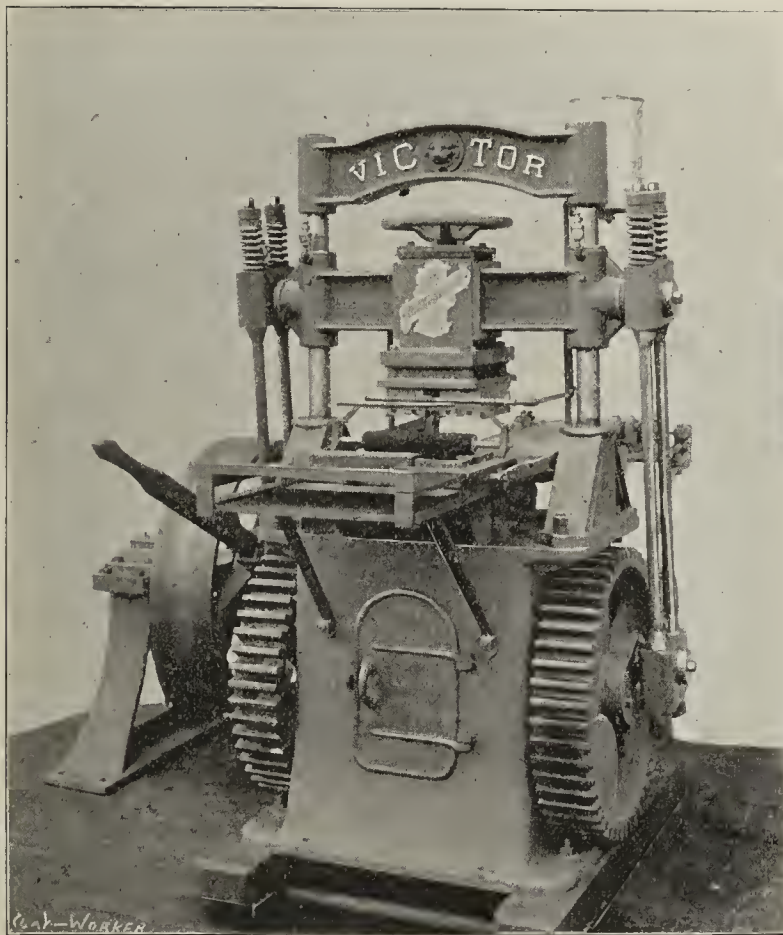
Automatic Dumping Car.



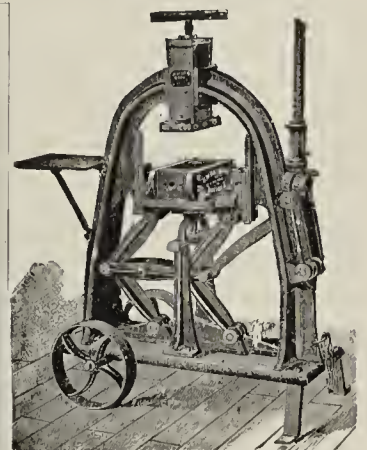
Bottom Dumping Car.



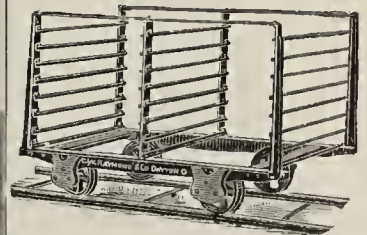
Wrought Iron Tempering Wheel.



The Raymond "Victor" Repress.

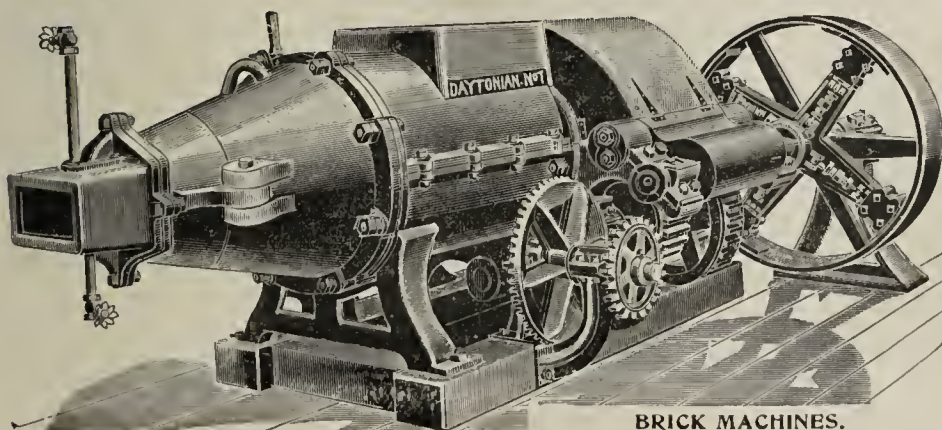


Perfection Brick Press.



Dryer Cars.

Ef you don't believe it just send for our catalogue.



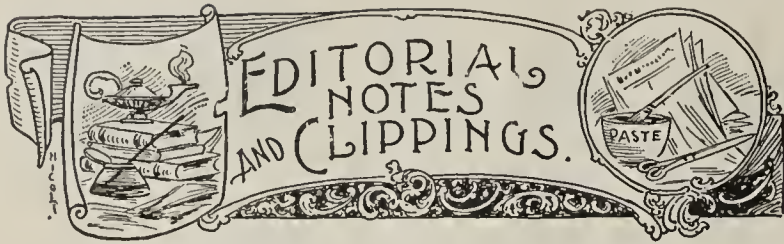
BRICK MACHINES.

We Sell 'em too like hot cakes.

...

**C. W. Raymond
& Company,**

Dayton, Ohio.



Mr. Cary contemplates establishing a brick and tile plant at San Leandro, Cal.

Roffers & Albers are making improvements at their brick plant at DePere, Wis.

The brick plant of Peter Higgins, at Bainbridge, Ohio, was recently destroyed by fire.

The Mingo (Ohio) Board of Trade has purchased a site for an encaustic tile factory.

W. L. Hissong advises us that he has purchased the brick plant of L. Hess at Butler, Ohio.

The new plant of the Enameled Brick Works, Freeport, Pa., is almost ready to begin operations.

Fire damaged the brickyard of E. A. Goodrich, Fitchburg, Mass., to the extent of \$100, recently.

A pottery is soon to be started at Arcadia, Ind., which will give employment to one hundred men.

George P. Thomas, Pleasant Run, Center county, Pa., is in the market for drain tile in carload lots.

The brickyard of W. H. H. Smith, St. Louis, Mich., was slightly damaged by fire September 30th.

A slight damage was caused by fire at the Salmen Brick and Lumber Company, at Slidell, La., recently.

Walter T. Klots & Brother's Sons, Brooklyn, N. Y., report a decided improvement in their brick business.

A new fire brick works will probably be established at Indiana, Pa. Hon. George W. Hood is interested.

John M. McKerchey, 45 Mayburg street, Detroit, Mich., writes that he would like to purchase a good brickyard.

William Glanville, brick manufacturer at Palmerton, Ontario, Canada, has made an assignment to H. McEwing.

Hamden Junction, Ohio, wants a brick plant. They have good clay and plenty of it, and now want some one to develop it.

T. Parmele has leased a steam brick plant at Louisville, Neb., and is busy getting things in shape to run the plant to its full capacity.

Frank Tranger, Humboldt, Kan., writes that he desires to burn crude petroleum under his boilers, and would like to purchase oil-burners.

The Pittsburgh Clay Manufacturing Company will build two large kilns at their No. 1 white-glazed stoneware plant at New Brighton, Pa.

Charles Barnhart, proprietor of Charles City (Iowa) Brick Company, was stricken with apoplexy September 29th, and died in a few hours.

D. P. Guise, the well-known brick manufacturer of Williamsport, Pa., has just booked an order for 300,000 paving brick for Baltimore.

Morton Brothers, Nebraska City, Neb., have a fine deposit of clay, and are experimenting with same with a view of manufacturing ornamental tile.

The brick plant at Kennet Square, Pa., formerly owned by Patrick Keating, has been purchased by James R. Miles, who will continue the business.

A contract for 4,500,000 brick to be used in the construction of a large building in Philadelphia has been awarded the Montello Brick Company, of Reading, Pa.

O. H. Nordstrom has been enlarging his brick plant at Punxsutawney, Pa., putting in new machinery, and expects to soon be manufacturing vitrified street-pavers.

Krick, Meyers & Co., brick and tile manufacturers of Decatur, Ind., have dissolved partnership. Henry Krick and John N. Tyndall succeed D. W. Meyers, who retires.

The plant of the Westmoreland Fire Brick Works, at Hunker, Pa., which has been idle for more than a year, has started up again, and will turn out a high grade of front brick.

Elder & Dunlap, manufacturers of the Perfect Clay Screen, at Bloomington, Ill., write that they are having a good trade. They have recently received orders for four of their screens.

We are advised of the death of Mr. E. C. Gano, of San Antonio, Texas, which occurred September 4th. Mr. Gano had been in the employ of the Ross-Keller Brick Machine Company,

of St. Louis, for many years, and was one of the best brickyard men in the country. He met his death by being pulled into a cotton gin. We have not learned the full particulars of the sad accident.

The Sharon (Pa.) Clay Manufacturing Company have put their plant in operation, after an idleness of several months. They have enough orders on hand to keep them running all winter.

In renewing his subscription, John M. Powers, Paterson, N. J., says he contemplates changing from an open to a pallet yard, and will be glad to receive any information regarding a pallet yard.

The Athens (Texas) Pressed Brick Company, in renewing their subscription to the Clay-Worker, ask to be put in communication with parties who can furnish them nice tile for hearths and mantels.

A. Putnam, representing a brick firm at Utica, N. Y., has purchased two hundred acres of clay land in Putnam county, Fla., on which a plant will be established for the manufacture of brick and other clay products.

The brickyards at Omaha, Neb., have experienced a revival in business the past season, nearly all of the plants there having run full time all summer, and some of them expect to be kept busy during the winter season.

B. A. Neale, Mayfield, Ky., would like to correspond with a practical up-to-date man who thoroughly understands the manufacture of brick and tile, who would like to join an enterprise to develop clay land in that vicinity.

The entire plant of the Winzeler Brick and Tile Company, at Archbold, Ohio, was completely destroyed by fire. The loss is estimated at \$6,000, on which there is \$3,000 insurance. It is supposed the fire was started by tramps.

The Creston Tile Company, Oregon, Ill., report an unusually large trade for the fall season, and although they had closed down for the season, they have started their works again to enable them to fill orders that are coming in.

The Pottery of A. H. Hews, North Cambridge, Mass., was damaged to the extent of \$11,000 by fire the morning of the 9th inst. The fire is supposed to have been of incendiary origin, and the loss is fully covered by insurance.

The death of Samuel Fowler, superintendent of the Westfield (Mass.) Brick Works, occurred at the Noble Hospital, in that city, October 1st. Mr. Fowler's home was in Newburg, N. Y., to which place the body was taken for burial.

John F. Ostrum, Box 147, Britt, Iowa, advises us that he wants to purchase a second-hand Penfield plunger brick machine, No. 6 or 7, or an Eagle soft mud machine. Mr. Ostrum says the machines must be cheap but in good condition.

The boiler-house of the Wellington Brick Works, Springfield, Mass., was destroyed by fire September 23d. The fire department responded promptly to the alarm, and the flames were confined to the boiler-room. The loss is \$1,200, covered by insurance.

The citizens of Macon, Ga., are agitating the question of owning and operating a paving-brick plant, to be controlled by the city. A number of the streets are soon to be paved, and it is thought it can be done with less cost if the city owns its own brick plant.

James J. Milnamow, for many years a brick manufacturer at Philadelphia, Pa., died at St. Agnes's Hospital there September 29th. Mr. Milnamow was seventy years old, and had passed the greater portion of his life in Philadelphia. Two sons survive him.

W. A. Squires, President of the Gulf & Brazos Valley Railway, Millsap, Texas, states that he has secured capital with which to erect a large pressed brick plant at Mineral Wells, near that place. He says the clay there is of superior quality and inexhaustible quantities.

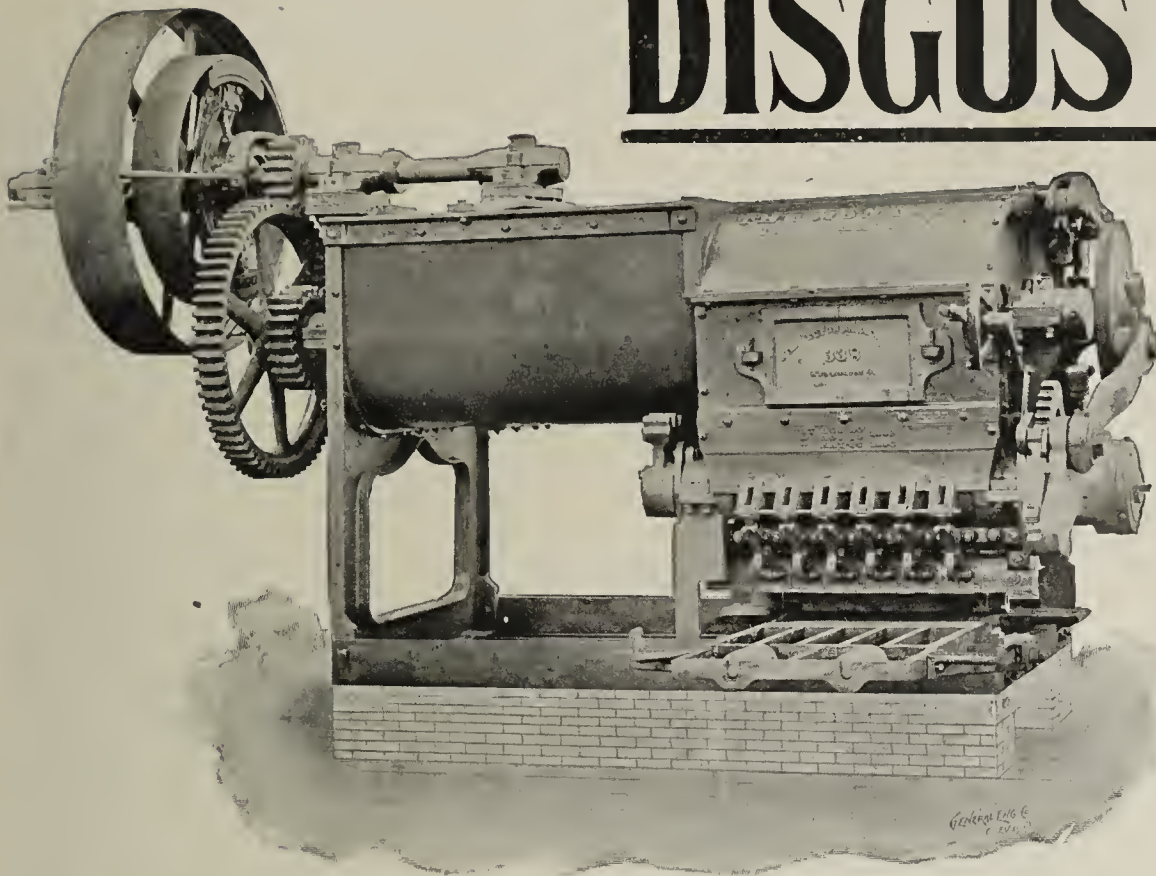
The plant of the Royal Clay Manufacturing Company, at Uhrichsville, Ohio, was offered for sale for the second time October 5th. No bids were received, and the result will be a third appraisal, unless those interested adopt some other plan to dispose of the property.

Walter J. Huber, a prominent citizen of Allentown, Pa., was stricken with paralysis of the heart September 28th, and passed away very suddenly at his home the same evening. Mr. Huber had been associated with William Egge for many years in the brick and tile business.

B. C. White, President of the Chisholm, Boyd & White Company, Chicago, has gone to Europe, where for three months he will seek rest and recreation. We bespeak for him a kindly reception among the clayworkers of the old world. They will find him a most affable companion, so genial and good-natured, indeed, that should any of the brickmakers over there insist

[CONTINUED ON PAGE 306.]

DISGUSTED



And wanting to kick themselves, have been several parties lately who bought machines, sanders, moulds or other supplies without getting OUR prices when they learned what they were.

Don't You Do It.

We don't claim to be "the only pebbles on the beach," but as we are one of the FEW firms who have been **LEADERS** (in every sense) for nearly a generation,—

Common sense will surely prompt you to know what we can do

NOW.

Prices on some goods were never so low.

The "Monarch"

Horizontal; with Double Pug Mill and Double Presses, and other valuable features contained in no other.

The "Iron Quaker"

Upright; simplest, best and lowest priced of any real competitor.

These two machines are unquestionably the leaders of their kind.

AUXILLIARY MACHINES AND SUPPLIES.

Pug-Mills, Disintegrators, Crushers, Mould-Sanders, Represses, Winding Drums, Dump Cars, etc., Moulds, Dump Tables, Dryer Cars, Kiln Doors and Castings, Elevators, Dump Carts, etc., etc.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE.

Odd sizes of moulds. Have not been used.

5 moulds, $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
20 moulds, $8\frac{1}{2} \times 16 \times 4\frac{3}{8} \times 2\frac{7}{8}$. 9-16 in. partitions.
12 moulds $9\frac{3}{8} \times 4\frac{5}{8} \times 2\frac{1}{2}$. $\frac{1}{2}$ inch partitions.

Second-hand, but used a few days only.

10 moulds, $9\frac{1}{2} \times 4\frac{9}{16} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
19 moulds, $9\frac{1}{2} \times 4\frac{5}{8} \times 2\frac{9}{16}$. " "
16 moulds $9\frac{1}{4} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 inch partitions.
16 moulds $9 \times 4\frac{1}{2} \times 2\frac{1}{2}$. 9-16 inch partitions.

The Wellington

Machine Co.,

WELLINGTON,

OHIO.

Send
for
Circular.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

on being told something of the Boyd Press, he will submit to an interview with perfect composure. We wish Mr. White a pleasant trip and a safe return by Convention time.

It is rumored that F. G. & G. H. Peck, the well-known brick manufacturers of Haverstraw, N. Y., are negotiating for the purchase of extensive clay property on Newburg Bay. If the deal goes through, Messrs. Peck will in all probability remove their plant from Haverstraw farther up the river.

The Chicago Brick Machinery Company, Chicago, Ill., write that their business is improving very satisfactorily. They say: "We are getting our full share of prosperity. Did more business in August and September than all the balance of the year, and the outlook is very promising for the future."

The National Kaolin and Ornamental Brick Company, whose works are at Brandywine Summit, Pa., has secured a contract for 200,000 of their white-gray brick for a school building in New York City. This brick is one of their specialties, and finds a large market in New York and Philadelphia.

Writing under date of October 8th, the Chicago Brick Machinery Company says: "As to business, we certainly have no cause to complain, and think we are getting our full share of prosperity. We did more business in August and September than in all the balance of the year, and the outlook is very promising for the future."

In reply to a query as to trade conditions, the Anderson (Ind.) Foundry and Machine Works say: "Everything is looking bright. Inquiries are plentiful for spring trade, and we hope to have the old times back on us again in the clayworking line. We have just installed a large machine in the Lerman-Kohlsaat Clayworking Company, Chicago."

The Humboldt (Kan.) Brick Company has been incorporated, with a capital of \$15,000, to manufacture brick at Humboldt. The directors for the first year are R. M. Works, O. H. Stewart, O. C. Brett, H. B. Wilsy and George A. Amos. The shale out of which vitrified brick are made is practically unlimited around Humboldt, and natural gas for fuel is plenty.

In a recent letter, the Michigan Brick and Tile Machine Company, Morenci, Mich., write that, while their trade for the past year has not been very brisk, they expect to close the year with some nice orders. They say the yards in that vicinity have had a nice trade, mostly on tile at a low price, but the indications are that by spring prices will be advanced to the old rate, and trade will be the best in years.

Karl Dangler, who established a pottery at Mingo, Ohio, some months ago, has his plant in working order now, according to the Steubenville (Ohio) Herald. He built a kiln after a design of his own, and has already manufactured some ware in it. His inventions were recently examined by several expert pottery men, who predict great things for them. He has already received several bids from firms who wish to buy his inventions.

A new clay manufacturing establishment has been started at Ogden, Utah. At present they are only making pottery and drain tile, for which they have a good demand. Within a short time the proprietors expect to be turning out sewer pipe, tile flooring, paving brick and stoneware of various kinds and patterns, the clays owned by the company being especially adapted for these uses. J. S. Smith, C. Graff and M. Butcher are interested in the plant.

Green J. Blake, a well-known and pioneer brickmaker of Macon, Ga., died at his home in that city September 14th. Although nearing his eightieth year, Mr. Blake was still actively engaged in the manufacturing of brick. One of the local papers, in announcing his death, says: "He was not only famous for his great integrity and high sense of honor, but was likewise celebrated for his devotion to friends and to a good cause. He was naturally a philanthropist, and his heart was ever full of charity."

In a recent letter Mr. H. T. Thorp, of Terre Haute, Ind., says: "Will you kindly mention in your October issue that we have here in our city men with plenty of capital to invest in developing our fine pottery and fire clay? But we need a man, one with some capital preferred, who has had some years' experience in clay work, to organize and manage a small pottery, or we might entertain a proposition from the right man for a large sewer pipe and brick plant." For full particulars as to railroad facilities, clays, etc., interested parties can address H. T. Thorp, 1339 Eagle street, Terre Haute, Ind., direct.

Joseph F. Wash, Secretary and Treasurer of the Missouri Fire Brick Works, recently incorporated at St. Louis, writes that they have purchased the plant formerly owned and operated by the Missouri Fire Brick and Clay Company, located at Cheltenham, Mo. (which is really a part of St. Louis). He

says: "We will continue the manufacture of fire brick, tile of every kind usually made by a fire clay plant, also handle the crude and prepared clay. We expect to make some additions to the factory shortly, increasing the present capacity to about 2,000 brick per day, which will necessitate new machinery, as well as kilns and buildings."

The revival of business in the clayworking industry is appreciated by the American Blower Company, of Detroit, Mich. They are furnishing a large brick dryer for F. Seitter's Sons, of Philadelphia, which makes up a list of about a dozen of the largest brick manufacturers in and about Philadelphia now equipped with that make of dryer. They are also furnishing apparatus to the Harbison & Walker Company, of Woodland, Pa., and through their Mr. Stengel, who has made so many successful installations, especially in the remodeling of old dryers, to Blatchford, Meeds & Co., of Verona, Pa. They are also filling a number of foreign orders of the same kind.

The various clayworking industries of the Southern States have enjoyed a fair trade the past season. The Atlanta (Ga.) Terra Cotta Company says: "Notwithstanding the apparent stagnation in the building line which is reported in the North and West, we find in the South, from the Atlantic coast as far west as Texas, that building of all kinds seems to be progressing steadily, without any of the harmful features of a boom. We have received more inquiries for material in our line this year than last, and have more work under contract. That is for us the best argument that we can give covering business activity, and we are well satisfied with the prospects."

Mr. J. S. Leahy, general southern agent of the C., H. & D. railway, with headquarters at Fourth and Vine streets, Cincinnati, O., has been appointed agent for the Washington and Alaska Steamship Company, and will handle this business in connection with the C., H. & D. business to Alaska. Their steamers "City of Seattle" and "Roselie" are giving service every five or six days to Alaska, and will run through the winter. They are magnificent steel steamers, and make the run from Puget Sound to Dyea and Skaguay in seventy hours. Splendid accommodations for 500 passengers, fitted with electric light and every comfort for passengers. These steamers sail under the American flag.

The motor car which the Baldwin people ship to the C., H. & D. Traction Company next week will, it is expected, prove an epoch in railroad local transportation matters. The design of the car is entirely new, nothing of this description ever having been attempted before in this country. It is calculated to run at high speed on the steam railroad track, and, at the same time, by virtue of condensing appliances, can be operated through the streets of a city without frightening horses. In this feature, it is really not quite as offensive as the trolley line, with its poles and attendant noises and sudden and startling flashes from the trolley connections. There are a great number of steam railroads in the country to-day anxiously awaiting the result of this experiment of the C., H. & D. people in the hope that it may afford a solution of the problem which now faces them, of carrying people on such short hauls as the inter-urban lines can do without the impracticable feature of the trolley wire over the steam railroad track.

DECATUR, JANUARY 5th AND 6th.

The next convention of the Illinois Clayworkers' Association will be held at Decatur, Wednesday and Thursday, January 5 and 6, 1898. The efficient Secretary, G. C. Stoll, Grant Park, Ill., advises us that he is now at work on the programme, and has already secured the promise of interesting papers by some of the ablest clayworkers of his State. A lively interest is being manifested by the lay members, and the local committee having in charge the entertainment of visitors are maturing plans that insure a pleasant time for all who attend.

THE PERFECT CLAY SCREEN.

Clayworkers who have found it necessary to pulverize and screen their clay in order to produce the desired quality of product, have found the screening feature the most bothersome part of their work. Especially is this the case with those who are using shale or fire clay, for in a majority of cases, these materials are difficult to screen, particularly where large capacity is required, for when crowded the average screen will clog up and send a large portion of the clay back to the crushers. These difficulties have all been overcome by the Perfect screen, manufactured by Elder & Dunlap, of Bloomington, Ill., who advise us that their screen in the result of several years' experience in working shales and fire clay.

The screen is simple in construction, and combines practical

features that give it great capacity. It is so constructed that the clay can be reduced to any degree of fineness required, and yet will not choke up, as ordinary screens do. Particularly is this the case where the clay contains moisture. Readers of the Clay-Worker who are having any trouble with their screens should correspond with Messrs. Elder & Dunlap, who will cheerfully give them the benefit of the experience obtained after several years of practical work.

NEWS FROM TIDE WATER, VA.

THE LEADING BRICKMAKERS of this section, E. W. Face & Son, are now at work building their new plant, which will be located in the city of Norfolk, in the Norfolk harbor. They have just finished driving the piling along the front of their property and now have a dredging machine deepening the water front. The reason of their moving is, they have exhausted their supply of clay or nearly so, as they have only about two million left. They intend fixing up the new yard while they are working up the rest of the clay. They have a good plant with Chambers' Bros. latest improved machine with automatic cutting devices, on which they turn out 33 thousand per day and dry them in a ten tunnel Sharer drier. They have the Raymond repress and are making a nice red press brick. On their new yard they intend having everything fixed for making brick, with the latest improved machinery and kilns. At this yard they will get their clay from the James river clay banks on barges and have conveyors to take it direct from barge to machinery. Mr. George S. Face is business manager and he is an up-to-date brickmaker and an all round business man, as one can readily see by visiting their plant. He is very courteous and takes pleasure in chatting and exchanging views with a brother brickmaker. I will write up a full description of their new plant when they get in running order.

At the yard of O'Brien, Stevens & Co., Norfolk, the brick racks collapsed, carrying with them the smoke stack. The racks were all full of green brick at the time, and they had a big lot of them, enough to dry a 30-thousand daily output.

They have a big contract on hand, and counting the loss of time, the loss will be very heavy.

August took with it another of Suffolk's prominent brickmakers; this time it was Mr. J. T. Nurney, who is well known to many brickmakers and machine manufacturers. He has been in the brick business here for twenty years, also in the real estate and wholesale business. He was a member of the city council at the time of his death, where he had served three terms. He was one of Suffolk's most prominent business men. He leaves a wife and one daughter.

Business has been fairly good here this season so far. There has been considerable building done in Norfolk, also in Portsmouth and Newport News. A fine hotel is being built in Norfolk now, which will take several million brick. The third story is nearly finished now. The brick are being furnished by the Old Dominion Brick Co., of Sturgeon Point, Va.

This has been a good year for the yards without a dryer. It has been a very dry season and we have had no severe storms to wash brick in racks or hacks. The brickmakers should be more thankful than the farmers this year, and if they have not made their usual output they have no reason to complain. They have had the weather to make brick and a fairly good demand to give them kiln room.

H. L. JACOBS.

A GOOD START—ROOM FOR MORE.

Publisher Clay-Worker:

We have just started a brick and tile and hollow block factory; have only one kiln as yet; will build others in the spring and will also increase drying shed room. Mr. John M. Shaffer, of Sedalia, Ohio, is the builder, owner and operator. Through my efforts the funds were raised to enable him to construct the works and at his urgent solicitation will be an interested party. Can not give capacity of machinery; he is doing fine work, turning out good solid tile and building block. A fine church is being erected out of his block, and it is receiving commendation of all. He now has orders for material to build two stores and one residence.

If you or your friends have money to invest, come and see us.

Bells, Tenn.

J. S. BRANDON.

He's Off at Last!



And we will all say, Good Riddance to him! May he fall so hard that he will never get on again!

Now the long suffering Brick Business will share in the general relief from Hard Times. It is a little late in the season for an immediate boom in building trades, that's true. But the man who "Reads the Signs of the Times" will put

his yard in shape this Fall for what he knows is coming. Don't forget we have anything and everything needed on Brick and Tile yards.

Chicago Brick Machinery Co., 225 Dearborn St.

PACIFIC COAST NEWS.

The clay and pottery business on this coast is decidedly quiet and evincing few signs of improvement. No contracts of any magnitude are on hand, nor is there likely to be for a little time yet to come. It begins to look as though the prophecies of the trade were true when it was claimed that the terra cotta and clayworking business would be the last to experience better times.

A valuable discovery of a fine quality of blue mineral clay is reported in East Astoria, Oregon. It is said to be equal in every respect to the German clay used in the manufacture of cement. The clay was first found when digging in the yard and making repairs to the cellar of a house, and the same quality of clay was also found on the adjoining property, where a well was dug 160 feet deep. The quality of the clay was the same all the way down. The clay is of a bluish color and can be taken out in big pieces. It can be cut into any form with a knife, and becomes very hard by simply being exposed to the air. The clay is good in its natural state for cementing the floors of cellars. It has the appearance of being a first-class clay for the manufacture of pottery and sewer pipe.

A new brick factory is to be established at Coyocan, Mexico, to be known as the "La Corina." The stock is held by Mexicans and foreigners. Five carloads of machinery have arrived for the plant, which will be erected at once.

The demand for the product of the Stockton Art Pottery Company has so increased that the company has not been able to supply the demand, and the works will have to be enlarged. Another pottery kilns will be built, and the size of the work-rooms will also be increased. The capacity of the plant will be almost doubled.

Common brick in the local market at Los Angeles, Cal., is selling for \$6 per thousand.

The clay found in the ledge on the farm of G. W. Dutton at Little Elk, Oregon, has been pronounced to be first class by experts in Portland, Oregon.

The plan of pumping water for Elsinore Valley, Cal., by electric power brings up the question of the opening of the pipe works at Terra Cotta. About twelve miles of good-sized pipe will be required, and if the terra cotta works are opened, it can be made there just as well as not.

Bricks are now being delivered from the yards at Placerville, Cal., and the managers are making preparations to burn another kiln, which will contain 100,000.

The Simons Brick and Contract Company has been awarded the contract for supplying the bricks for the new Hotel Green Annex, at Pasadena, Cal. About 1,400,000 will be required. The same company also received the contract for supplying the brick for the new Combs & Banning Building at Monrovia, Cal.

An excellent quality of fire clay is found with the coal discovered at Garlock, Cal.

The patent continuous kiln of the Baden Brick Co., at Baden, Cal., has been completed. The capacity of the kiln is 800,000 brick per month, and from thirty-five to forty men will be needed to keep the kiln in full operation. The company has now re-commenced brickmaking.

Gilbert Bros., of Salem, Ore., have been handling first class fire clay this season, and now have on exhibition a splendid lot of fire brick made from it. Several lots have been put in places where they will be severely tested. If they "stand fire" it is the intention to put in a big kiln and supply the market.

SUNSET.

Down in Jersey.

The Tide of Prosperity—Water Causes Fire.

Editor Clay-Worker:

The clay industries and the manufacture of clay goods is moving along at about the usual rate in this section of New Jersey. The factories are now all running. The Raritan Hollow and Porous Brick Co. has started up again full handed, and I am informed that shipments are good.

The Staten Island Terra Cotta Co. is now in the possession of Mr. Addicks and out of the hands of the receivers. No attempt as yet has been made to rebuild the burned hollow brick department of this plant.

The Salamander works at Woodbridge, recently burned, was fired in a very peculiar way. Near the works a brook runs. On the night of the fire a couple of kilns were red hot. A very tempest of rain fell and in a few moments the brook could not carry it away fast enough; the tide also being ex-

remely high at that hour the water was backed up into the fire holes of the red hot kilns, with the result of an immediate explosion and firing of the works. There has always been danger of this kind and we hear that the works will hardly be rebuilt upon the same plot.

Red brick are in fair demand for foundations in the city, but very few structures are being erected here. This is one of the questions your scribe has tried to fathom since residing here, why so many frame houses are built where brick are so cheap as they are here. I verily believe Jersey people build frame houses so they can paint them "yaller," as this seems to be the prevailing color.

The Terra Cotta works are only doing a medium business.

By the way, the Standard Fire Proofing Co., of this city, corrects me for calling them the Standard Hollow Brick Co.

If the data that Brother Lyle promised me so long ago does not soon materialize I shall have to set him down as one who forgets easy (just like we well-drillers).

Business in general seems to be better in the East although many complain of collections. We believe that if people would stop talking slow business and get right down to hard knocks, we should have an immediate improvement all along the line.

We noticed yesterday while passing Henry Maner's works, a large building going up on his property to be used as a store room. This building is built of 8-inch hollow brick and covered with red tile made at his own works. Mr. Maner has also commenced the erection of a public school building of a very handsome design, which when finished will be presented to this city. This building will replace the old one known as Number 3, long since too small for the number of pupils in that vicinity. The city is now letting contract for Number 5 school building, to be built in North Amboy. This part of our city was nine years ago a wilderness. There is also talk of building a new high school, as the "kids" seem to increase faster than facilities for educating them is provided. We would suggest a curtailment of production or else build a new school every year. All these buildings will be of brick.

A new business block just finished here has a beautiful front composed of light mottled brick imported from Zanesville, Ohio. Surely this is a case of "carrying coals to New Castle," as Perth Amboy holds the credit of being the first to manufacture mottled brick. These brick are beauties though, and reflect credit on the manufacturer who made them.

The Raritan Porous and Hollow Brick Co. are now building a new kiln, said to be used for burning glazed tile in.

With abundant crops in New Jersey, as in other parts of the United States, we see no reason for delay in revival of business. We ourselves can not complain, as all our machinery is busy constantly.

We recently finished a flowing water well for this city which produces 256,000 gallons per twenty-four hours of very pure water. Depth, 185 feet. This development shows well for the future of the city's water supply, which has not been up to what it should be for some time past.

We agree with you that "our time is coming." This vast country is too immense to be kept down, and will keep on advancing until no country in the world will ever be able to catch up with us.

Perth Amboy, Oct. 5, 1897.

W. R. O.

AMONG THE BUCKEYES.

The recent adjustment of the coal strike had a telling effect on the clay interests in and around Akron. Every manufacturer of clay products wears a smile on his face that it is a pleasure to behold. Orders for sewer pipe, fire brick, building brick, roofing tile, building blocks, drain tile, stoneware, china ware, decorated flower pots, etc., are received from all parts of the country, and will keep most shops here at work till springtime to fill present orders. Many of the potteries and sewer pipe works are running from 5 o'clock in the morning till dark night trying to meet their demands. Prosperity has surely struck Akron clay industries.

The National Sewer Pipe Company, of Barberton, Ohio, said to be the largest sewer pipe plant in the world, and of which Mr. O. C. Barber, of "Diamond Match" fame, is President, is running to its fullest capacity. The general manager, Mr. E. M. Buel, informed the writer, a few days ago, that business with them was never better. Fifty-two large down-draft kilns are kept constantly at work to burn the ware. The company use every twenty-four hours about six carloads of coal for these kilns and for under their boilers. This will give the readers of the Clay-Worker some idea of the enormous output from this factory every month.

SNIDER.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker



Read What

H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE, 60TH AND HAVERFORD STS.

TELEPHONE 147, W. P.

**H. C. CARROLL & SONS,
Brick Manufacturers,**

Residence, 3831 Lancaster Avenue.

3 YARDS: { 57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

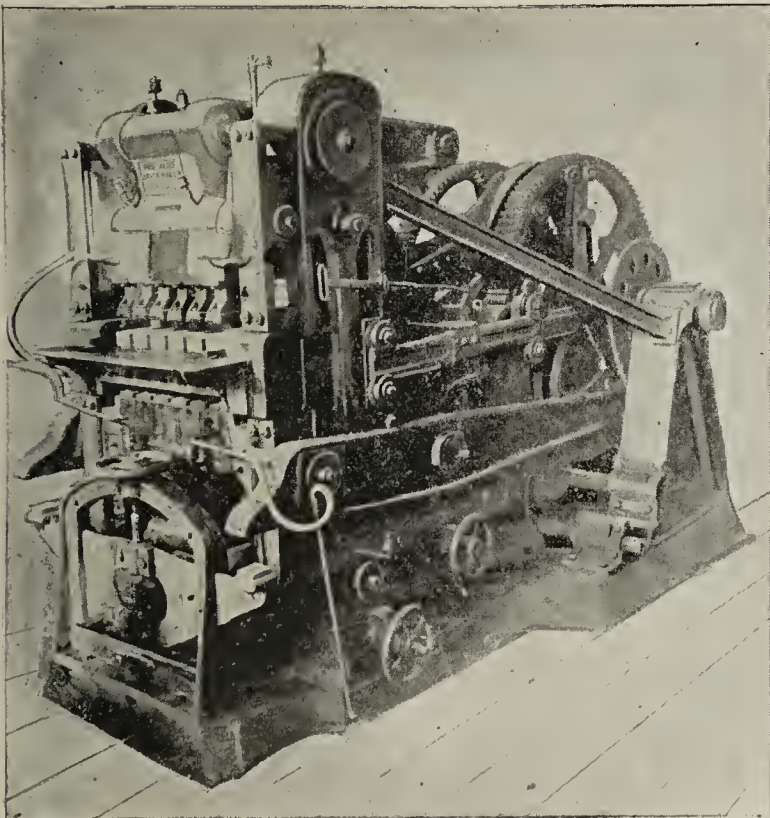
We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell your troubles to"

The F. D. CUMMER & SON CO., Cleveland, Ohio.

The PROGRESS BRICK PRESS.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE
ON APPLICATION. . . .

Progress Press Brick and Machine Co.,
King's Highway and Oak Hill R. R. **ST. LOUIS, MO.**

\$1 EXCURSION TO DECATUR AND RETURN.

On Sunday, October 17, 1897, the Indiana, Decatur & Western Railway will run a Special Fast Excursion Train to Decatur and return. Fare for the round trip, One Dollar (\$1.00.). Special train will leave Union Station, Indianapolis, 7.00 a. m., arriving at Decatur at 12 noon. Returning, Special Train will leave Decatur at 6.30 p. m. Tickets good only on Special Train.

JOHN S. LAZARUS,
General Passenger Agent,
Indianapolis, Ind.

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cent a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE—75,000 second-hand 34-inch pallets; price, 3 cents each on cars, Buffalo. J. F. STENGEL,
93 c 928 Ellicott Square, Buffalo, N. Y.

WANTED—Situation, by a first-class dry press or paving brick burner. Understands the business and can give good references. Address A. E. M.,
101 c Care Clay-Worker.

WANTED—A paying brick plant or good clay land; town of 10,000 to 30,000. Give full particulars. Eastern States only. Address BOX 518,
101 c Care Clay-Worker.

WANTED—Situation as a superintendent of brick works; thoroughly understand the business; have had forty years' experience. Address W. T. G.,
101 L Care Clay-Worker.

WANTED—A situation as superintendent of a brick or tile works. have had 14 years' experience and can give the best of references as to ability. Address
101 c TIDMARSH, Care Clay-Worker.

FOR SALE AT A BARGAIN—One 4-mold Boyd dry press brick machine in perfect condition.
THE FERNHOLTZ BRICK PRESS CO.,
8 tf 1 St. Louis, Mo.

NO DRY PRESS Brick Plant complete without the Carmichael Clay Steamer. T. W. CARMICHAEL,
Inventor and Manufacturer.
6 tf d Clarksburg, W. Va.

WANTED—An experienced man to act as superintendent and head burner in a fire brick plant. One who would take an interest in the business preferred. State age and whether married or single. Also give references. Apply to
P. O. BOX NO. 294, Roanoke, Va.

FOR SALE OR EXCHANGE—Valuable clay beds, clay close to surface; shipping facilities, railroad, river or Lake Michigan; fuel, 4-foot wood, only \$1 to \$1.25, delivered. A bargain. Address
PETOSKEY,
101 cm Care Clay-Worker.

WANTED—A first-class engineer, at Port Murray, N. J. Must be conversant with tile machinery. Apply either in person or by letter, with references, to
MR. P. F. REID,
Care Pittsburg Terra Cotta Lumber Co.,
101 d Port Murray, N. J.

FOR SALE—Stiff mud outfit, consisting of one Raymond auger machine, "No. 777." One automatic side cut-off. One Columbia double repress. All as good as new, and a decided bargain. Reasons for selling, clay not suitable. Address A. NO. 1,
101 L Care Clay-Worker.

A RARE CHANCE—There is an excellent opening for the establishment of an up-to-date common building brick plant in one of the most prosperous Southern cities, plenty of clay, large demand for brick and limited competition. Will be pleased to correspond with parties having capital to invest. Address L. E. W.,
101 d Care Clay-Worker.

WANTED—Experienced man to superintend a drain tile plant. This is an excellent opportunity for the right man. Apply, giving references, and stating age, experience and salary expected, to the
LEHIGH BRICK, TILE & MFG. CO.,
101 dm Lehigh, Ia.

FOR SALE—The Stamford Stove Lining Works. Valuable tide-water front and railroad privileges. Three kilns, engine and boiler, and machinery. Can be bought for one-half cost. The business has been consolidated with the Brooklyn Fire Brick Works. Location and market first-class. Address H. A. PERKINS,
101 dm 88 Van Dyke St., Brooklyn, N. Y.

FOR SALE, VERY CHEAP—Large brick plant in southeastern Nebraska, original cost \$45,000, with five acres city ground and ten acres clay land, especially adapted for paving and building brick. A great bargain in view of advancing prosperity and erection of exposition buildings in Omaha. For terms address E. O. KRETSINGER, Beatrice, Neb., or
W. F. HILLEBRAND,
101 d Washington, D. C.

FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade. First-class references. Address
SUPERINTENDENT,
101 d Care Clay-Worker.

WANTED—Situation as general manager, by a first-class Potter's Onemist with years of experience, understands all details of the business, can superintend and furnish formula's for the making of C. C. White Granite, Porcelain, Vitrified and Bone China, also all kinds of Colored Glazes for tile and brick. Bristol glazes for stoneware. Highest references furnished as to ability etc. Address
8 tf dm J. B., care Clay-Worker.

WANTED—A position in a roofing tile works, by a man who has the best improved Spanish roofing tile pattern yet put on the market, and who has also had 17 years' experience as a stoneware potter. Can adjust the white Bristol or any colored glaze. Address
WELCHMAN,
101 d Care Clay-Worker.

SITUATION WANTED—As business manager or salesman for manufacturer of front brick. Have had over ten years' experience as a dealer. Am thoroughly up in selling and handling all makes of pressed, repressed and enameled goods, and large acquaintance with architects over the country. Address
C. B. A., care Clay-Worker.

A BIG BARGAIN.

For sale cheap—a well-equipped brick plant in Northern Wisconsin; no other plant within 50 miles; clay burns red and there is an abundance of it; good railroad facilities, forty acres of clay land and large amount of timber suitable for fuel. A fine opportunity for a young brickmaker to start for himself. For full particulars, address
7 tf d WALLACE, care Clay-Worker.

A VALUABLE CLAY PROPERTY TO BE HAD AT A BARGAIN.

The advertiser offers upon favorable terms a location in northwestern Pennsylvania for making fire, building and vitrified paving brick, flooring, roofing and drain tile, sewer pipe and terra cotta in all its branches, and, in fact, all clay products except pottery. Twelve different kinds of fire clay and shale, in inexhaustible quantities, are on the property, burning white, buff, pink, salmon and red in color. On the property are also from twelve to fifteen million tons of bituminous coal, which can be delivered to works along the railroad for 50 to 60 cents a ton. Shipping facilities are first-class. A set of twelve bricklets, showing color and quality, forwarded on application. One vein six feet thick burns a pure white brick, which does not shrink in burning, adapting it especially for making enameled brick and tile. Address
"PENNSYLVANIA,"
103 cm Care Clay-Worker.

THIS SPACE IS RESERVED FOR

ELDER & DUNLAP,
Bloomington, Ill.,

MAKERS OF

The Perfect Clay Screen,

Which they build of any desired size and capacity. It is at once the **cheapest and best** Clay Screen.

Write them for particulars.

S. GEYSBEEK, Zanesville, Ohio.

Ceramic Chemist,

SPECIALTIES—Analyzing clays, bodies, glazes and all Ceramic materials and products. Adjust bodies and glazes on every pottery line. Formulas for bodies and glazes for Pottery, Roofing Tile, Brick and Terra Cotta.

Suggestions and conclusions from analysis and pyrometric tests given free of charge. **JUST DROP A LINE, LET ME KNOW YOUR TROUBLES AND I WILL ADVISE YOU.**

BRICK CARS

30 Different Styles,

Let us Save You Money.

The
Run
Easy
Kind.

Walworth Run Foundry Co.,
CLEVELAND, OHIO.

Conveying, Elevating and...
Power-Transmitting Machinery.

H. W. CALDWELL & SON CO.

Specialties for Handling
Material of
all Kinds.

GENERAL MACHINISTS,
127, 129, 131, 133 West Washington St.,
CHICAGO.

CALDWELL
Steel Conveyor.
Manufactured exclusively by us at Chicago with latest
improvements

Send for Catalogue.



CALDWELL-AVERY BEAM-
LESS STEEL ELEVA-
TOR BUCKETS.

LINK BELTING.
SPROCKET WHEELS.
COTTON BELTING.
RUBBER BELTING.
LEATHER BELTING.
BELT CLAMPS.
ELEVATOR BOLTS.
ELEVATOR BUCKETS.
CONCRETE MIXERS.
FRICTION CLUTCHES.
JAW CLUTCHES.
COUPLINGS.
FLEXIBLE SPOUTS.

GEARINO (all kinds.)
ELEVATOR BOOTS.
HANDERS.
PERFORATED METALS.
PILLOW BLOCKS.
IRON PULLEYS.
WOOD PULLEYS.
SHAFTING.
SET COLLARS.
SWIVEL SPOUTS.
TAKE-UP BOXES.
TURN HEAD SPOUTS.
WIRE CLOTH.



WANTED—Situation as superintendent of a paving or building brick plant. Know how to operate and manage both, and am familiar with all kinds of machinery, driers and kilns. Have had years of experience, and am thoroughly reliable. No bad habits. Address BOX 88, 6 tf d Care Clay-Worker.

FOR SALE—Brickyard at St. Johnsville, N. Y., complete, with down-draft kiln, pug mill, auger machine, boiler and engine, racks, barrows, tables, sheds, all ready for business, and an abundance of clay, on easy terms. For the right man this is as good as a gold mine. For particulars inquire of ROTH & ENGELHARDT, St. Johnsville, N. Y. 83 dc

FOR SALE — Brickyard, completely equipped; capacity, 25,000 soft mud brick per day. Is now in operation, making the best brick made in Columbus, O. Yard on paved street and near railroad switch. Have four down-draft kilns, of 75,000 capacity each, and one outside kiln of 400,000 capacity. Great bargain to good man. J. A. McAULEY, Columbus, O. 8 tf 5pm

FOR SALE OR RENT.

Large brickyard at Spring City, Pa.; two brick kilns, 300,000 capacity; Monarch brick machine, capacity 25,000 per day; complete plant; best quality clay for common and pressed bricks; railroad siding, coal sheds and office. Address W. S. FURST, 83 md 738 Drexel Bldg., Philadelphia, Pa.

FOR SALE, CHEAP.

The St. Joe Brickyard, situated on the Northeastern-Queen & Crescent Railroads, thirty-five miles north of New Orleans. Completely equipped in every respect. Capacity, six million brick per year. Is now in operation. Can be bought for less than one-third original cost. The machinery all in first-class condition. A good money-making plant. Offering for sale because too far to give personal supervision. Address WM. GARIG, Baton Rouge, La. 7 4 10pm

FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house. 8-foot Chisholm, Boyd & White dry pan. 1 revolving screen and mixer, 1/4 screen and bucket elevator, with 20 6-inch buckets. 6 spring brick trucks. Lot shafting, belting and pulleys. 75-horse-power Westinghouse engine. 1 Barr Pumping Company steam pump. 1 Chambers Bros. Company brick machine. All new or little used, and in excellent condition. WALNUT, 5 tf d Care Clay-Worker.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.

NEW YORK.

Sole Importers in the United States of the

Precipitated Carbonate of Barytes
K.B. W.F.&C.

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

M. V. B. WAGONER'S

SLIP CLAY { For Glazing of Pottery } WORKS

ESTABLISHED 1845.

Clay in stock in any quantity, in barrels and bulk by the carload.

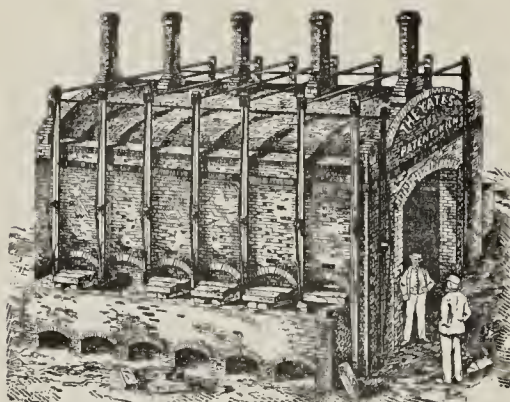
Office, 20 Ten Broeck St., ALBANY, N. Y.

THE
HOT BLAST
APPARATUS
FOR DRYING
BRICK
TILE AND
TERRA COTTA

American Blower Co
SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

SEND FOR CATALOGUE

GEO. S. COX'S
Ready Made
Cutting Wires,
 Always give Satisfaction.
EAST LIVERPOOL, OHIO.
 Send for Samples and Prices.



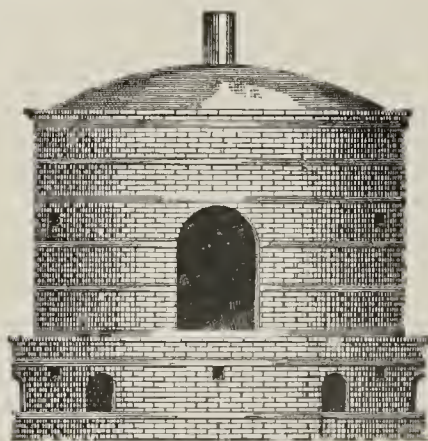
For Economy of Fuel and Percentage of Hard Burned Brick.

This kiln has no equal, I will be glad to tell you all about it.

ALFRED YATES, Johnsonburg, Penn.

AN IMPROVED MUFFLED KILN

For Burning Terra Cotta, Fine Front Brick, Enameled Brick, Encaustic Tile, etc., etc.



THIS IS the best and cheapest kiln in the long run. It is guaranteed to do its work in a perfect and even way. There is no loss in burning with this kiln. Every piece put in comes out perfectly burned, whether set in top or bottom. We have had many years' experience in building terra cotta, brick and tile kilns of different kinds, and can guarantee successful and satisfactory results, being practical kiln builders. Our terms are reasonable. Write for particulars, stating character and capacity of kilns desired.

F. HUNDT & CO.,
 801 North Winchester Ave., Chicago, Ill.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.

C. B. RYAN,
 H. W. FULLER, Ass't Gen'l Pass. Agent.
 Gen'l Pass. Agent, CINCINNATI, OHIO
 WASHINGTON, D. C.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in United States, Canada and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
 Marletta, Pa.

Chenoa, Ill.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

F. H. C. MEY,
Chain Belting Engineering Works,

Approved Appliances for
Elevating, Conveying and Transmission of Power,
 64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



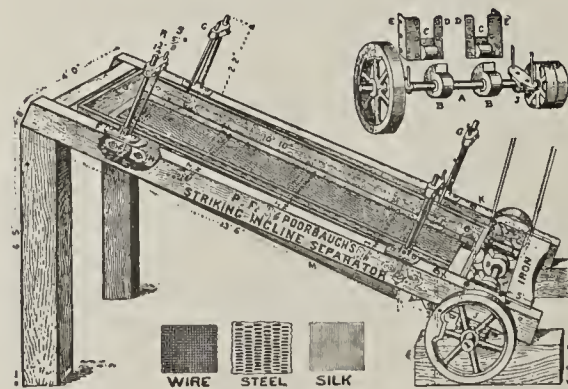
MEY PATENT CLAY ELEVATOR.

Make
Many More
Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

STRIKING INCLINE SCREEN



For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.

These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

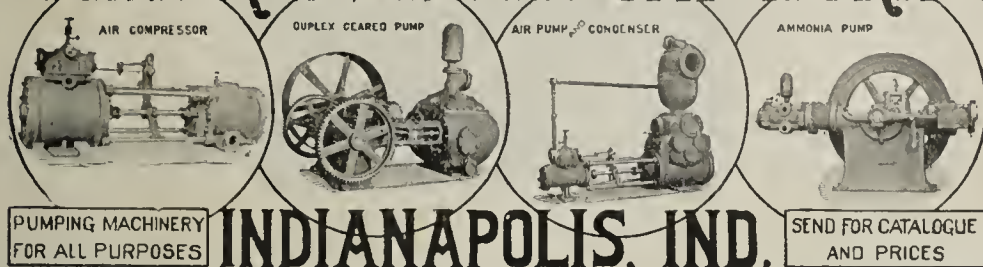
Manufactured by the

THE PITTSBURG MINERAL SCREEN CO.

Write for Prices.

PITTSBURG, PA.

DEAN BROS' STEAM PUMP WORKS.



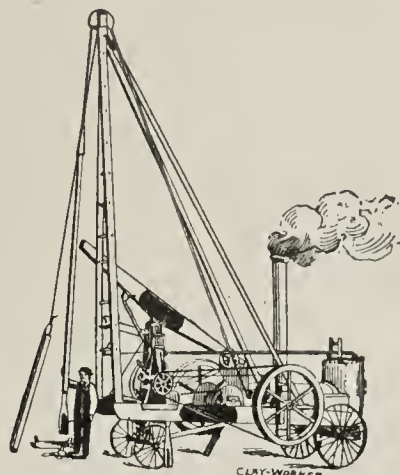
COLORIFIC.

For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of WESTBROOK & WELLS, Ogdensburg, N. Y.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,
PERTH AMBOY, N. J.

Steubenville Foundry & Machine Works,

Established in 1820.

—Manufacturers of—

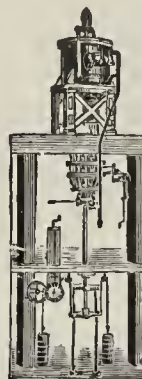
STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,

Making From 2 to 30-Inch
Pipe Inclusive.

Pipe, Brick, Tile, Coping,
Fire Proofing, and
Building Block Dies.

Clay Grinding and Tempering
Pans and Pug Mills.



FEED
SCREWS
FOR
MINING
CLAY.



STEAM
—ENGINES

—AND—

Every Variety of Iron and Brass Castings
Shafting and Pulleys.

Send for Circulars and Estimates.

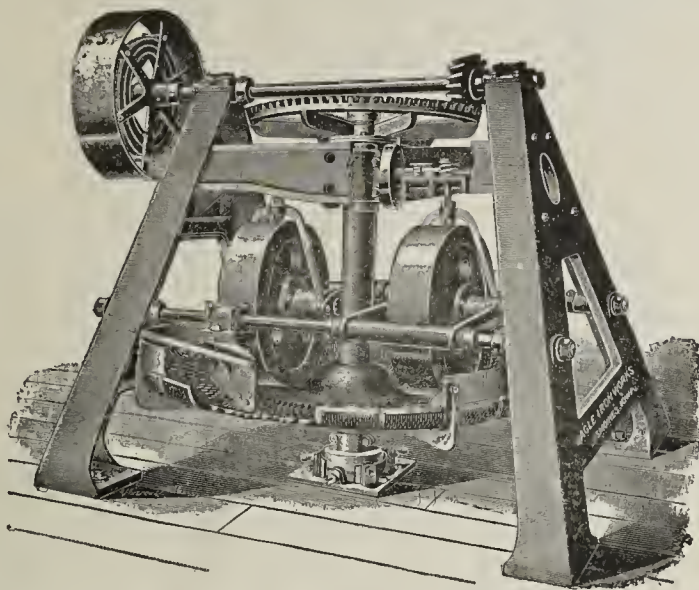
JAS. MEANS & CO,
Steubenville, Ohio.

OUR NEW 9 Ft. IRON FRAME DRY PAN

SEND for catalogue and read up on our patented features of this machine. Our motto in its construction and design is

"NOT HOW CHEAP.
BUT HOW GOOD."

EAGLE IRON WORKS, Des Moines, Ia.



BRICK MACHINES AND REPRESSES.

....

THIS cut represents our Stiff Mud Brick Machine. It will work any kind of brick material including fire clay, shale or common clay right from bank without the use of a pug mill. Each brick is pressed separately and can be haked 7 or 8 high, or repressed right from machine.

Over 500 in operation.

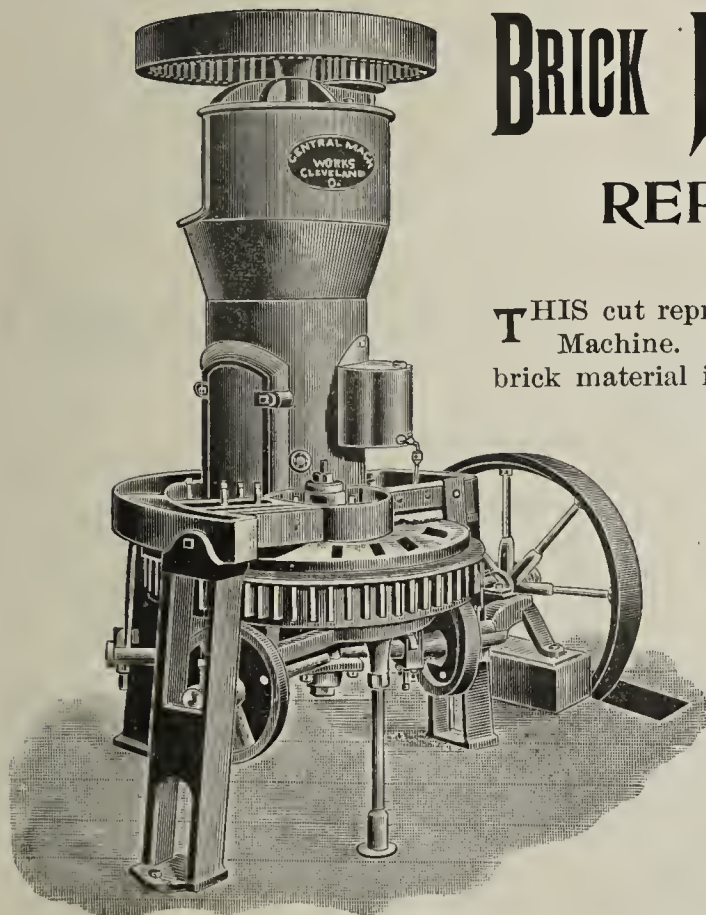
Send for price and circulars

Manufactured by

CENTRAL
MACHINE
WORKS,

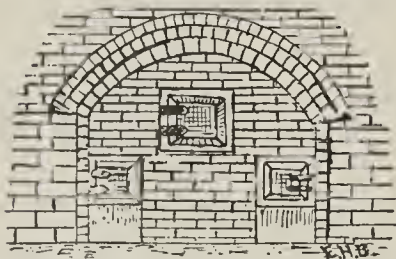
226-236 Abbey St.

Cleveland, Ohio.



NOTICE—We furnish all supplies and repairs for any make of the "Sword" Brick Machine.

Swift's Kiln Furnace,



F. E. SWIFT'S PATENT SLACK COAL COKER,
GAS GENERATOR AND SMOKE CONSUMER.

CAN BE ATTACHED to any kind or style of Up or Down-Draft kiln. Nothing but slack or waste coal used from start to finish of burn.



Fires not disturbed but once in 10 hours till water smoke is off. Guaranteed to water-smoke dry press brick or the tenderest of clays or ware of any kind without damage. These furnaces can be seen in operation at my works at all seasons burning drain tile in winter and brick in Summer. It will pay you to investi-

gate—I can save you good money.
For further particulars, address

F. E. SWIFT,
Washington, Iowa.

The Keystone Brick Yard Supply Co.,

**Office and Works: 240 Arch Street,
LANCASTER, PENN.,**

MANUFACTURERS OF

Machine Brick Moulds

a Specialty.

With the latest improved machinery, and the best of skilled help and the very best material we are enabled to furnish moulds better and cheaper than any other make. Please let us know what you may want and receive some interesting prices.

Common Brick Moulds 5 or 6 Brick.....	\$1.75
Iron Lined heads " " " " "	2.10

Write for special discount on
all orders after July 1.



Do You Want

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular.

Commercial Intelligence Dep't, **ASSOCIATED TRADE & INDUSTRIAL PRESS,**
ESTABLISHED NINE YEARS. Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.



“LEVIATHAN.”
 “Upon Earth There is not His Like.”

.....Sept..... 1896.
MAIN BELTING CO., 55 and 57 Market St., Chicago, Ill.

Gentlemen:—Please ship us via freight, 146' x 18' 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige.

Yours very truly,

Manufactured under Special Process.
A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

Main Belting Company,

Sole Manufacturers LEVIATHAN BELTING.

55 and 57 Market St., CHICAGO, ILL.

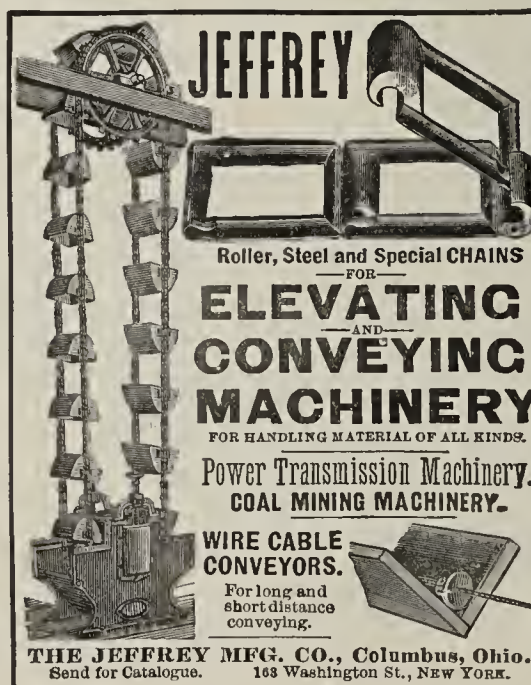
PHILADELPHIA:
1219 Carpenter Street.

BOSTON:
120 Pearl Street.

Elevators

**For handling
CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.**

**Also Furnish
RUBBER,
LEATHER,
COTTON
BELTING.**



Conveyors.

**Manufacture
SHAFTING,
PULLEYS,
HANGERS,
GEARS,
CLUTCHES,
BUCKETS,
BOOTS,
BOLTS,
Etc . . .**

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

Standard Dry and Wet Pans

For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

....

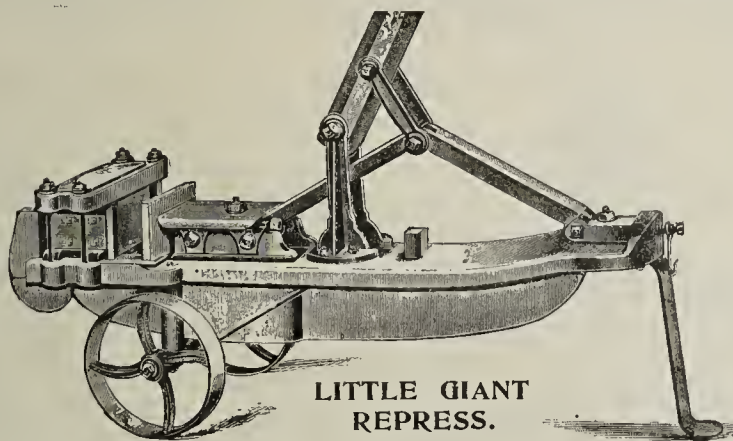
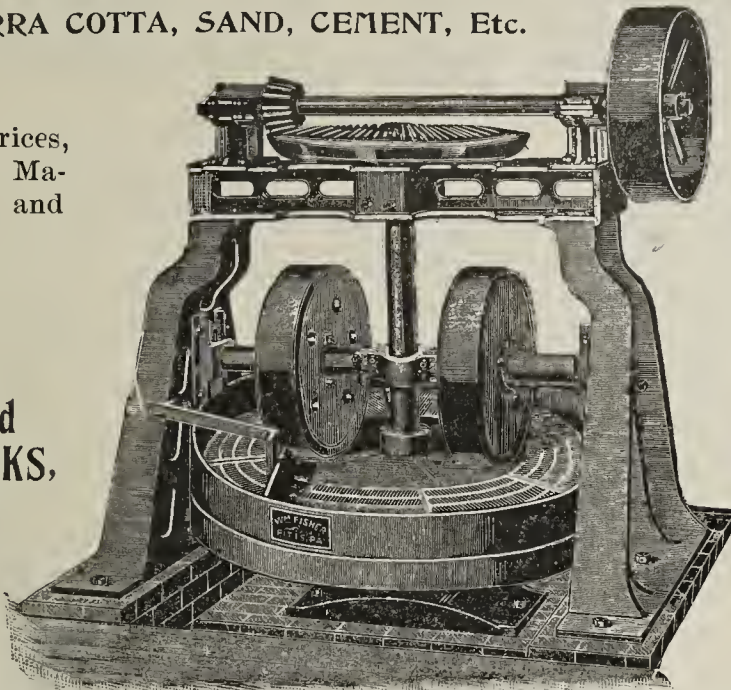
When writing for Prices, state kind of Clay or Material to be ground and capacity required.

....

**FISHER ENGINE
FOUNDRY and
MACHINE WORKS,**

Phillips & McLaren,
Proprietors,

24th and Smallman Sts.,
PITTSBURG, PA.



LITTLE GIANT
REPRESS.

ELI Auger Machine,
Capacity 45,000 to
70,000.

ELI Jr. Auger Ma-
chine, Capacity 30,-
000 to 40,000.

LITTLE ELI Auger
Machine, Capacity
15,000 to 20,000.

No. 1 A, Auger Ma-
chine, Capacity 25,-
000 to 35,000.

No. 2 B, Auger Ma-
chine, Capacity 12,-
000 to 20,000.

THE No. 1 A and No. 2 B Machines furnished with Square Hopper in place of Upright Pug Mill if desired.

DISINTEGRATORS, HORIZONTAL CONVEYORS,

GRANULATORS—SINGLE AND DOUBLE SHAFT,

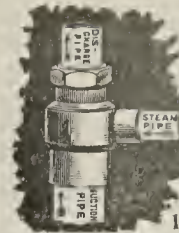
UP-RIGHT PUG-MILLS, WINDING DRUMS,

BRICK TILE AND HOLLOW BLOCK TABLES.

TRUCKS, WHEELBARROWS, Etc.

Manufactured and fully warranted by

Michigan Brick and Tile Machine Co.,
MORENCI, MICH.



VANDUZEN STEAM PUMP

THE BEST IN THE WORLD.

Pumps Any Kind of Liquid.
Always in Order, never Clogs nor
freezes. Every Pump Guaranteed.

10 SIZES.

200 to 12000 Gallons per Hour.

Cost \$7 to \$75 each. Address

THE E. W. VANDUZEN CO.,

102 to 108 E. Second St., Cincinnati, O.

Davis's Brick, Tiles and Terra Cotta. Third
Edition. Revised, Improved and Enlarged.

RECENTLY PUBLISHED.

A Practical Treatise on the Manufacture of

Brick, Tiles and Terra-Cotta

Including Stiff Clay, Dry Clay, Hand-made, Pressed or Front, and Roadway Paving Brick, Enameled Brick, with Glazes and Colors, Fire Brick and Blocks, Silica Brick, Carbon Brick, Glass Pots, Retorts, Architectural Terra Cotta, Sewer Pipe, Drain Tile, Glazed and Unglazed Roofing Tile, Art Tile, Mosaics, and Imitation of Intarsia or Inlaid Surfaces. Comprising every product of Clay employed in Architecture, Engineering and the Blast Furnace. With a Detailed Description of the Different Clays employed, the Most Modern Machinery, Tools and Kilns used, and the Processes for Handling, Disintegrating, Tempering and Molding the Clay into Shape, Drying, Setting and Burning. By Charles Thomas Davis. Third Edition. Revised and in great part rewritten. Illustrated by 261 engravings. 662 pages, 8vo. Price\$5.00

This volume will be sent by mail to any address in the world, or delivered by express C. O. D., freight paid, to any address in the United States for \$5.00

A circular of eight pages, with specimens of the illustrations, showing the full Table of Contents, will be sent free to any one furnishing his address.

HENRY CAREY BAIRD & CO.

Industrial Publishers, Booksellers and Importers,

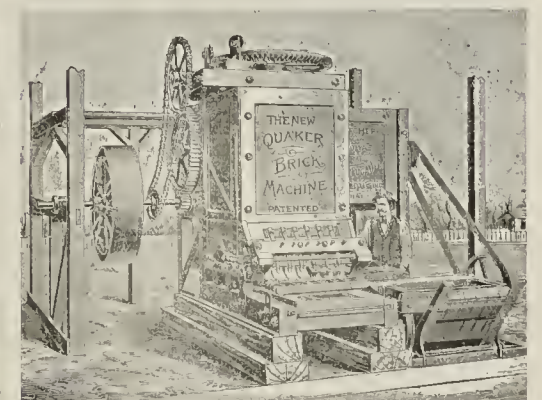
810 Walnut St.

PHILADELPHIA, PA., U. S. A.

Soft Mud Brick Machinery

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sand-



ing Machine, capacity 40,000 or more per day. We carry in stock a full line of first-class brickyard supplies at a very reasonable price.

Send for Catalogue.

James W. Hensley,

General Agent,

Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

FAST TIME AND THROUGH SERVICE TO SOUTH BEND.

Commencing June 22, through parlor cars will be operated between Indianapolis and South Bend daily, except Sunday, on Big Four train No. 3, leaving Indianapolis at 5 p. m., making immediate connection with Vandalia line fast train at Colfax, which passes through Frankfort, Logansport, Lake Maxinkuckee and Plymouth, arriving at South Bend at 10:45 p. m. G. E. ROCKWELL, D. P. A., for details.

A. F. TENNILLE'S

Bureau of

News and Legislative Information,

Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.

What do YOU know about Bricks, Tiling, Pottery?

WE know ALL about SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road.

For particulars write

J. ST. KOWSLOWSKY,
Industrial Agt., St. Louis, Mo.
or
E. W. LABEAUME,
G. P. and T. A., St. Louis, Mo.



Solid Train Between
Sandusky and Peoria
—AND—
INDIANAPOLIS and
MICHIGAN CITY,
FT. WAYNE and
CONNEERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger..... 7:00 a. m.
*No. 22 Passenger..... 1:20 p. m.
No. 24 Passenger..... 7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger..... 10:20 a. m.
No. 23 Passenger..... 2:50 p. m.
No. 25 Passenger..... 6:20 p. m.
*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on
A. H. SELLARS, Agent,
Lake Erie & Western R. R.
C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.



GEORGE A. MOSHER,
President.

JAMES A. BUCK,
Vice-Prest. and Gen. Man.

LE ROY VERMILYEA,
Secretary and Treasurer.

The Buck Machine Company,

SOLE MANUFACTURERS OF

Champion Brick Mold Sanding Machines, COHOES, N. Y.

The above Company was duly incorporated on the 8th day of March, 1897, under the laws of the State of New York, with a capital of \$60,000, which has been fully paid in.

This company has acquired by purchase all the interests of J. A. Buck and others in the business of manufacturing Champion Brick Mold Sanding Machines heretofore conducted by him, together with all patents covering said machines.

Of these patents, No. 301,087 is the foundation patent on the feed-rack applied to a cylinder machine. Buck's title to this patent was fully sustained by the decision of the United States Circuit Court of Appeals filed December 8, 1896, which decision was affirmed January 25, 1897, and a motion for a rehearing of the case denied. From this decision there is no appeal, and the title to this patent cannot be disturbed.

Patent No. 499,206 was sustained by Judge Coxe of the United States Circuit Court in a decision filed February 6, 1897, wherein he also sustained Buck's title to said patent. This patent covers the yielding form of feed rack as used in the later Champion Sanders. On February 15, 1897, a decree of the Court was entered granting and injunction against the use of infringing machines.

A copy of these decisions will be sent by mail upon request.

Claims against users of infringing machines will be actively prosecuted.

This Company is now prepared to promptly furnish the latest and most approved style of Champion brick mold sanding machines.

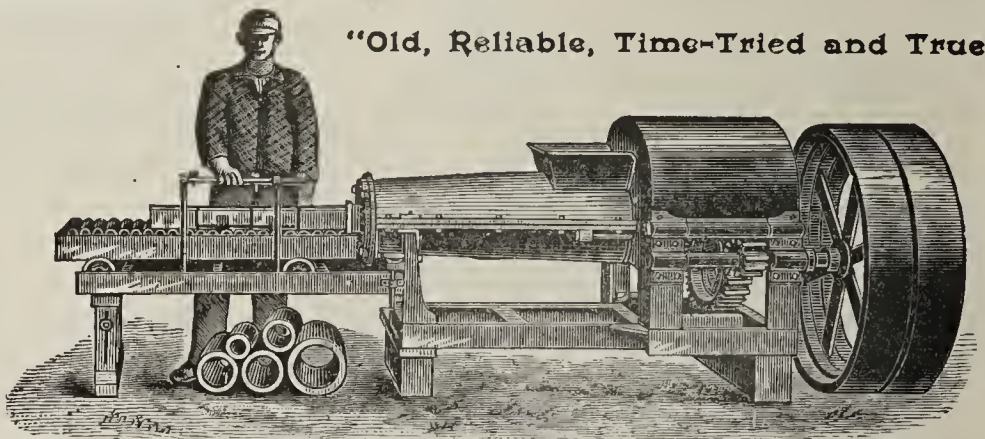
These machines are guaranteed in every respect, and purchasers will be fully protected in their use.

No agents should be recognized except those presenting credentials from this Company. All communications, orders and payments should be made direct to

THE BUCK MACHINE COMPANY, Cohoes, N. Y.

KELLS & SON'S IMPROVED BRICK AND ... TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON, PARKHILL, ONTARIO,

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the NEW QUAKER BRICK MACHINE.

G. COLDEWE & CO.,

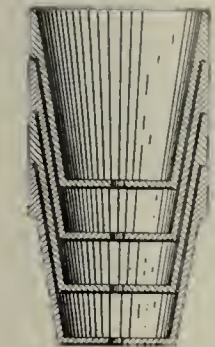
MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and... MACHINE MOULDS

We manufacture the the most substantial Moulds known, and guarantee every Mould to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

INDIANAPOLIS, IND.



CHAMPION Brick Mould SANDING MACHINES.

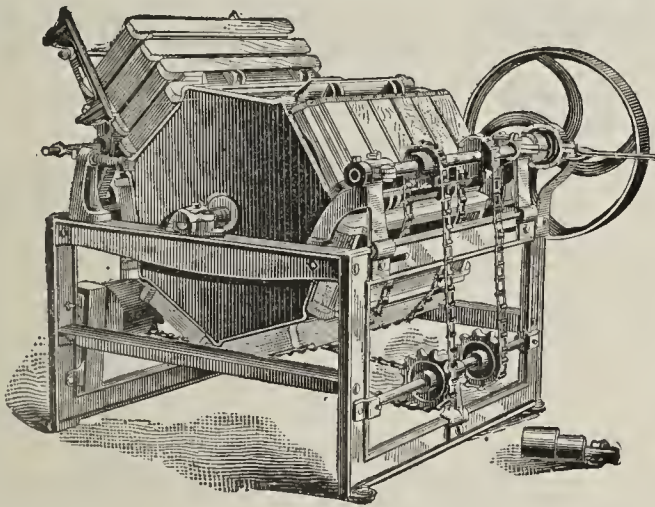
This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and Serviceable.

A. H. NEWTON,
Manager and Sole Agent,
HAVERSTRAW, N. Y.

THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, and a suit for that purpose has been commenced against Buck and is now pending in the United States Circuit Court for the Northern District of New York.

Only one patent No. 301,087 was involved in that decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit has been commenced on these patents against Buck, and any persons purchasing from him or his agents will be prosecuted for infringement.



4000 TO 5500

(Gallons of Water per hour.)

BY HAND-POWER.

Pumps, Hand-power Pumps.

(LOUD'S PATENT.)

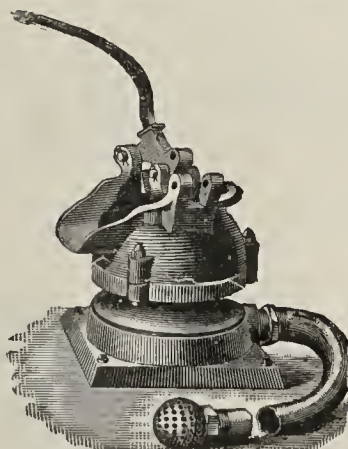
These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries or wherever it is desired to raise a large quantity of water by Hand-power. The pump has large valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



THE CENTRAL PASSENGER ASSOCIATION 1,000-MILE INTERCHANGEABLE REBATE TICKET

Is for sale at principal Ticket Offices of THE PENNSYLVANIA LINES.

It is honored one year from date of sale for Exchange Tickets over either of the following named Lines:

Ann Arbor,
Baltimore & Ohio,
Baltimore & Ohio Southwestern,
Chicago & Eastern Illinois,
Chicago & West Michigan,
Cincinnati & Muskingum Valley,
Cincinnati, Hamilton & Dayton,
Cleveland & Marietta,
Cleveland, Canton & Southern,
Cleveland, Cincinnati, Chicago & St. Louis,
Cleveland, Lorain & Wheeling,
Cleveland Terminal & Valley,
Columbus, Hocking Valley & Toledo,
Columbus, Sandusky & Hocking,
Detroit & Cleveland Steam Navigation,
Detroit, Grand Rapids & Western,
Dunkirk, Allegheny Valley & Pittsburgh,
Evansville & Indianapolis,
Evansville & Terre Haute,
Findlay, Fort Wayne & Western,
Flint & Pere Marquette,
Grand Rapids & Indiana,
Indiana, Decatur & Western,
Lake Shore & Michigan Southern,
Louisville & Nashville (Between Louisville and Cincinnati and between St. Louis and Evansville),
Louisville, Evansville & St. Louis,
Louisville, Henderson & St. Louis,
Michigan Central,
New York, Chicago & St. Louis,
Ohio Central Lines,
Pennsylvania Lines West of Pittsburgh,
Peoria, Decatur & Evansville,
Pittsburg & Lake Erie,
Pittsburg & Western,
Pittsburg, Lisbon & Western,
Toledo, St. Louis & Kansas City,
Vandalia Line,
Wabash Railroad,
Zanesville & Ohio River.

The price of these Tickets is Thirty Dollars each. They are not transferable. If the ticket is used in its entirety and exclusively by the original purchaser, a rebate of Ten Dollars is paid by the Commissioner of the Central Passenger Association.

E. A. FORD,
Pittsburg, Pa., Gen'l Passenger Agent.

STOP-LOOK LISTEN

THE POPULAR

MONON ROUTE

IS THE BEST LINE TO

CHICAGO

TIME REDUCED TO 4 3/4 HOURS.

FOUR DAILY TRAINS

Leave Indianapolis	{ 7:00 a. m., 11:50 a. m. 3:35 p. m., 12:55 night
Arrive Chicago	{ 12:00 noon, 6:00 p. m. 8:20 p. m., 7:20 a. m.
Trains	{ 3:30 a. m., 7:45 a. m.
Arrive Indianapolis	{ 2:35 p. m., 4:37 p. m.

LATEST IMPROVED

VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant

PARLOR CARS AND DINERS

Local Sleeper in Indianapolis Ready at 8:30 p. m.
Leave Chicago, Returning, at 2:45 a. m.
Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: 2 West Washington St.,
Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.

VANDALIA LINE

The Short Line for

ST. LOUIS AND THE WEST.

LEAVE	AT. TERRE	AT. ST.
INDIANAPOLIS,	HAUTE	LOUIS.
* 7:20 am	10:05 am	.....
* 8:10 am	10:15 am	3:15 pm
* 12:40 noon	2:35 pm	7:12 pm
* 7:00 pm	9:04 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am

*Daily.

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46 Jackson Place and Union Station.

W. W. RICHARDSON, Dis. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS

MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns **WANTING INDUSTRIES**

This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

TAKE THE
BIG 4
TO
ST. LOUIS

BRICK CARS and TRUCKS

Of Any and All Kinds.
Easy Running. Light yet Strong.

Don't fail to get our prices. Catalogue free.

THE ATLAS BOLT & SCREW CO.,
Cleveland, Ohio.

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,

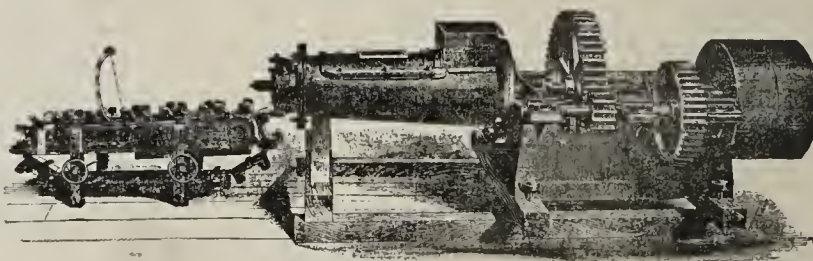
Clarksburg, W. Va.

Fourteen (14) sold already this Season.

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers
... of **Tile and Brick Machines.**



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequalled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

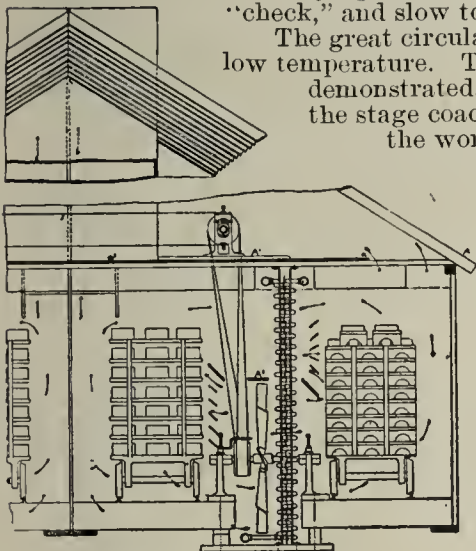
Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Mention the CLAY-WORKER,
When writing to Advertisers
Mention the CLAY-WORKER.

Still Further Testimony!

Soft Mud Brick Dried in 10 or 12 hours.



The INSIDE FAN DRYER.

U. S. Pat. Mar. 31, 1891. No. 449,170.
U. S. Pat. Mar. 31, 1891. No. 449,231.
British Pat. Mar. 31, 1891. No. 5,520.
Canadian Pat. May 30, 1892. No. 39,025.
Canadian Pat. May 30, 1892. No. 39,026.

You have the best drier in the market and I purpose in the near future to put in another two track section. Wishing you success, I am

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,

CHAMBERS BROTHERS CO.

J. H. CHAMBERS, Gen'l Mgr.

306 Hannah St., West, Hamilton, Ont. Can. }
July 10th, 1897. }

S. G. Phillips, Esq., Rahway, N. J.

Dear Sir:—I am pleased to reply that your little 12 feet x 54 feet, two track, drier has been in use by me since May 15th, 1897 and works remarkably well.

Our clay takes from six to eight days to dry on yard pallets and three or four days in a neighboring drier, yet the six or seven thousand large soft mud brick it holds on 16 cars are easily dried in 10 or 12 hours in a superior and most economical manner because of heating with the engine exhaust steam only.

The endless belts drive the 10-60 in. diameter (inside volume) fans easily not appearing to cost over 6 or 7 h. p. at 360 turns per minute to fairly make the wind blow.

Yours truly,

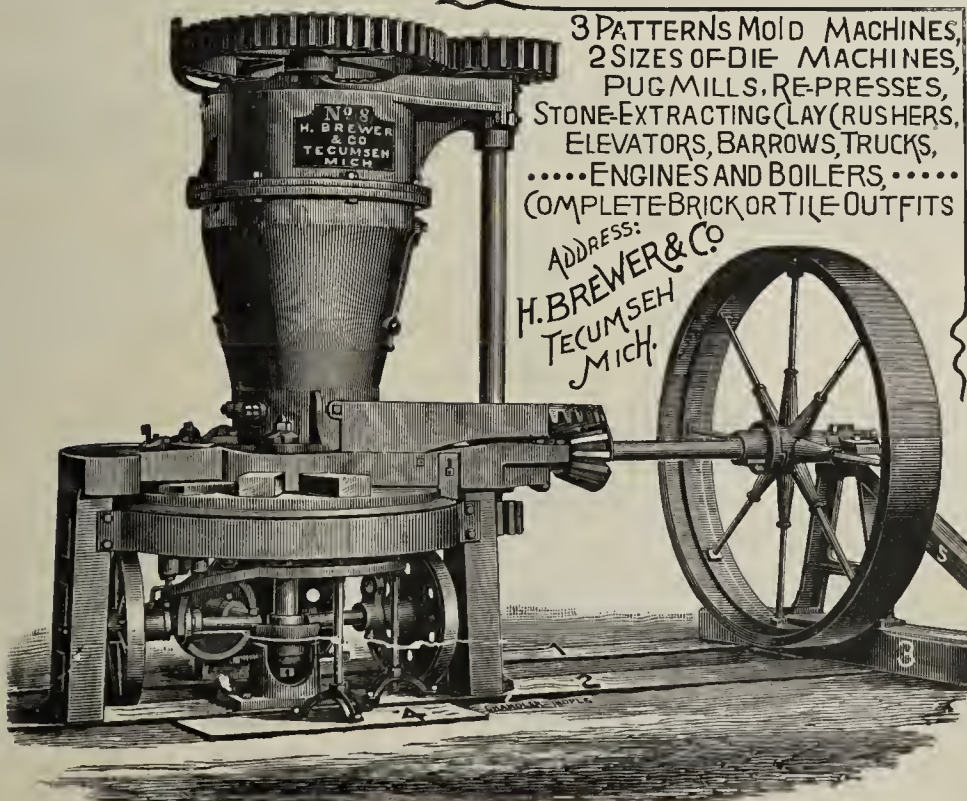
JOHN W. FRID.

S. G. PHILLIPS.

Agent and
Patentee,

161 Grand Street.

Rahway, N. J.



3 PATTERNS MOLD MACHINES,
2 SIZES OF DIE MACHINES,
PUG MILLS, RE-PRESSES,
STONE-EXTRACTING (LAY) RUSHERS,
ELEVATORS, BARROWS, TRUCKS,
..... ENGINES AND BOILERS,
COMPLETE BRICK OR TILE OUTFITS

ADDRESS:
H. BREWER & CO
TECUMSEH
MICH.

ARCHITECTURAL DRAWING

Designing: Architecture; Mechanical Drawing;
Machine Design; Stationary, Locomotive and
Marine Engineering; Electricity; Plumbing;
Railroad, Hydraulic & Bridge
Engineering; Surveying and Mapping; Sheet
Metal Pattern Cutting; Bookkeeping; Shorthand;
English Branches; Mining; Metal Prospecting.
All who study **GUARANTEED SUCCESS.**

Fees Moderate, Advance or Installments.

Circular Free; State subject you wish to study.

International Correspondence Schools, Box 958, Scranton, Pa.



Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD, JACKSONVILLE and HANNIBAL, MO.

Through Sleeping Cars to St. Louis, Mo., via I. D. & W. Clover Leaf Route.

TIME OF TRAINS AT INDIANAPOLIS:

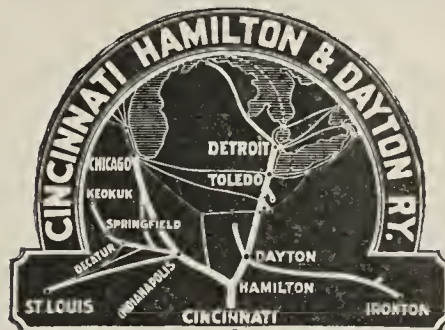
LEAVE.

Mail and Express.....	8.15 a m
Accommodation.....	3.45 p m
Fast Express.....	11.10 p m

ARRIVE.

Fast Express....	3.35 a m
Accommodation	10.40 a m
Mail and Express.....	4.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



INDIANAPOLIS AND CINCINNATI LINE

6 Trains Daily. Parlor Cars and Cafe Dining Cars on day trains; Pullman, Compartment and Standard Sleeping Cars, and Chair Cars, also Wagner Sleeping and Chair Cars on night trains. Direct Connection made at CINCINNATI without Omnibus and Transfer, for all points

SOUTH
and
EAST

INDIANAPOLIS, TOLEDO AND DETROIT

The Michigan Line (via Hamilton.)

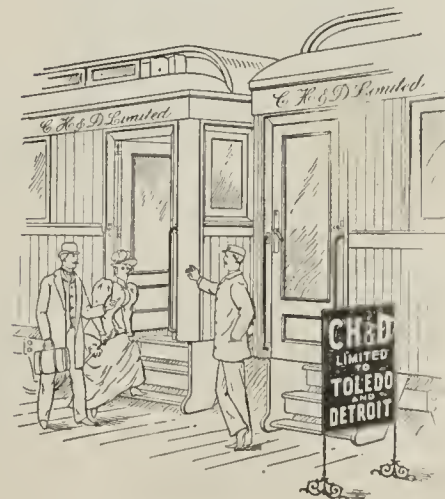
5 Trains daily to Dayton.
2 Trains daily to Toledo.
2 Trains daily to Detroit.

Observation, Vestibuled Coaches and Parlor Cars on Through Express Trains. Pullman and Wagner Sleeping Cars on night trains.

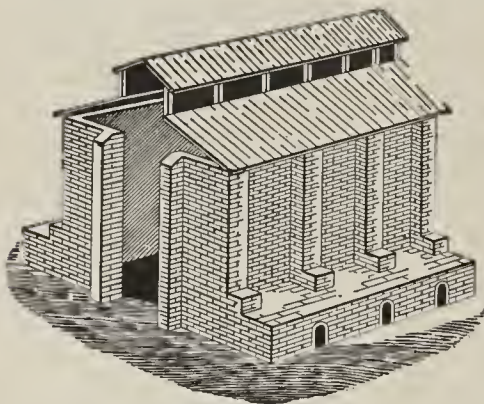
G. W. Hayler, D. P. A. } Indianapolis,
W. J. Nichols, T. P. A. } Ind.

D. G. EDWARDS,

Passenger Traffic Manager.



Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS,
Mention the CLAY-WORKER.



Up-Draft Kiln.

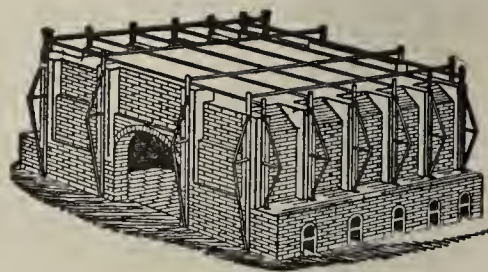
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET.
The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiln.

ALSIP'S

LATEST IMPROVED DOWN and UP-DRAFT KILN.

IS SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

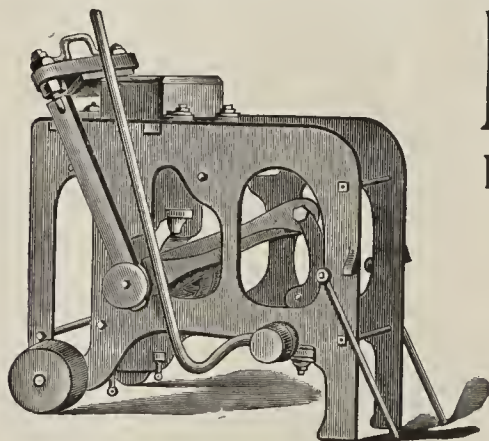
If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

Address, **S. H. ALSIP,**

Days Brick Yard.

— BELLEVILLE, ILL.



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,

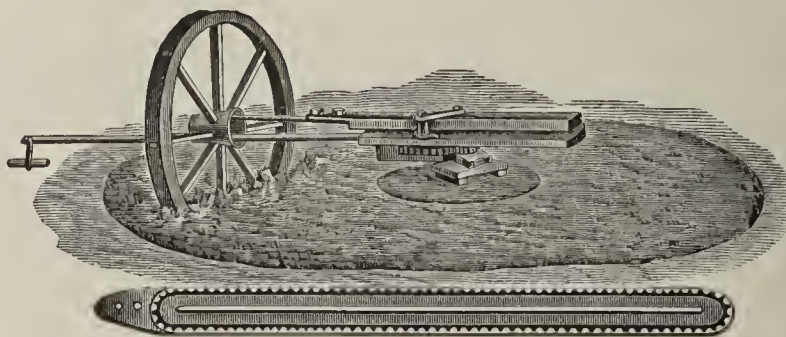
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

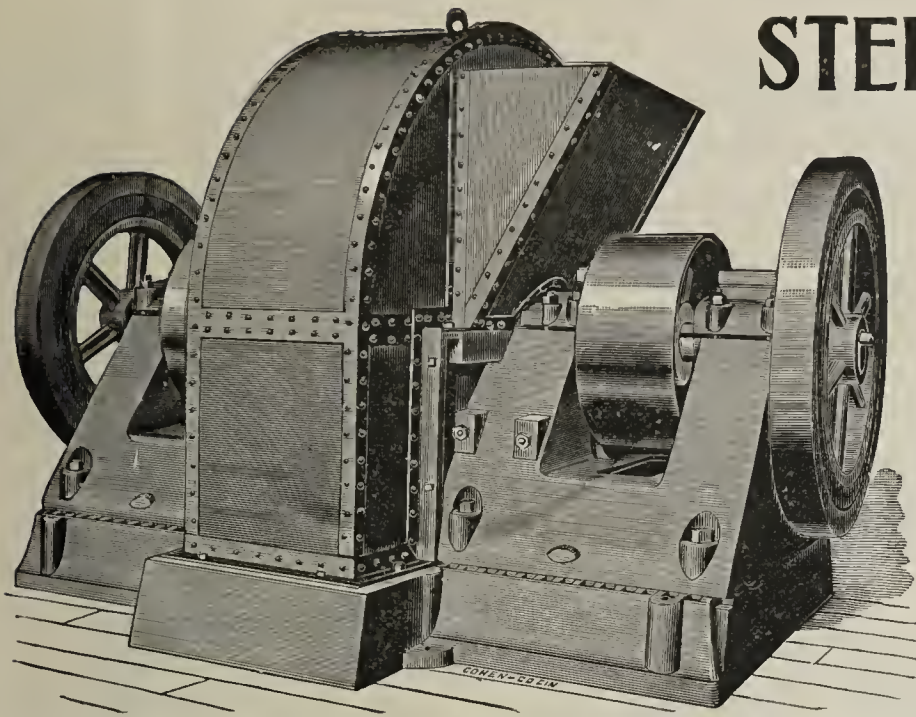
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Send for Circular and Price-List.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it **will not clog** in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,
Aurora, Ind.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,
Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

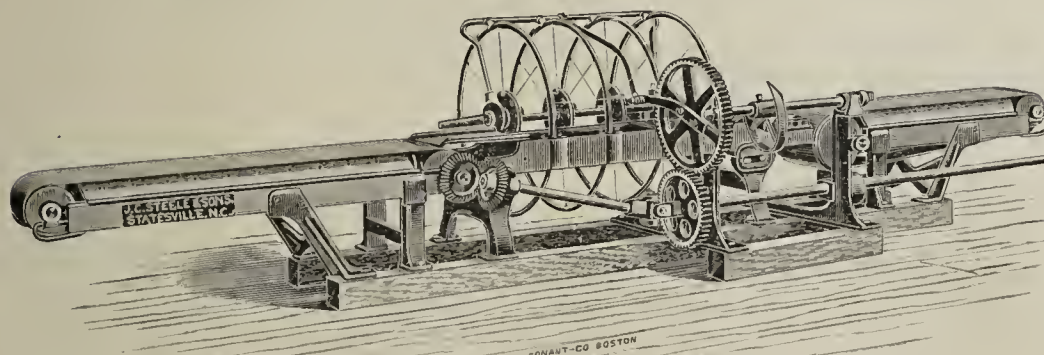
[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

The New South Brick Machinery

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.



Automatic Cutting Machine.

GREENVILLE, S. C., Sept. 23rd, 1897.

J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Since putting in your "Xtra" machine with automatic cutter I have the brick business of this city all to myself. I made 112 in one minute this morning, and can make 50 M any day of 11 hours. The bricks are dandies.

Yours very truly,
THOS. J. HANNON.

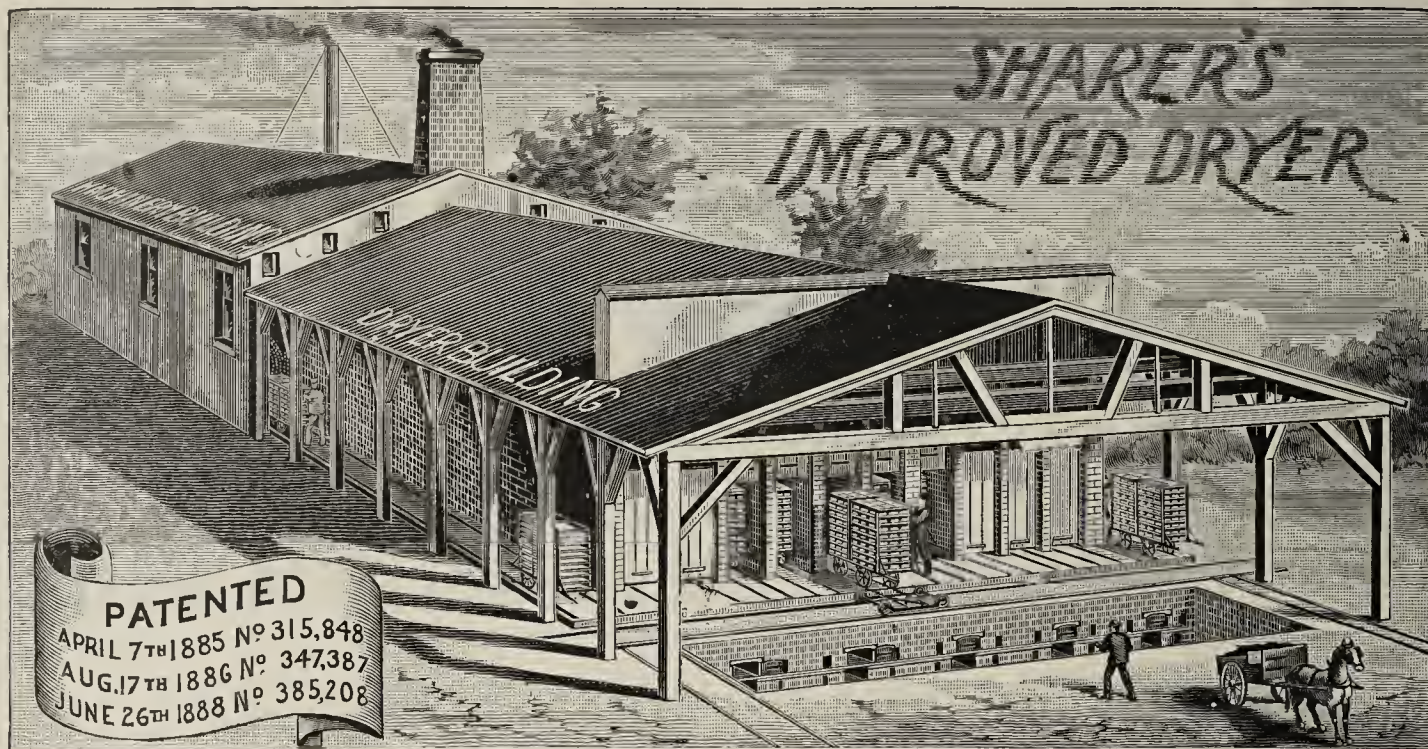
Mr. Hannon took out another machine that was almost new, and put in our "Xtra." We do not claim 50 M per day for this machine, but this is what our customers say that it will do.

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.

Geo. W. Sharer,

Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.



COMPLETE Dryer and Kiln outfits, and Complete Plants a specialty. Address

GEO. W. SHARER, ²²²⁴ Tioga, St. Philadelphia, Pa.

CONLEY AND WOLFE
IMPROVED KILN COMPANY.

TARKIO, Mo.

OFFICERS:

DAVID RANKIN, PRESIDENT, TARKIO, Mo.	JOSEPH CONLEY, VICE-PRESIDENT, MOUND CITY, Mo.
W. F. RANKIN, SEC'Y AND TREAS., TARKIO, Mo.	J. M. WOLFE, GEN'L M'GR, TARKIO, Mo.

PATENTS:

N° 477,983, JUNE 28, 1892.
N° 477,994, JUNE 28, 1892.
N° 487,174, NOV. 29, 1892.
N° 491,037, JAN. 31, 1893.
N° 491,038, JAN. 31, 1893.

THIS KILN is cheap to construct, simple in operation and permanent in character. It has no crown to fall in and costs nothing for repairs. The dampers in the bottom give complete control of the heat and draft. It burns all brick evenly and thoroughly. It heats the brick gradually and cools the same, producing a tough and thoroughly annealed brick. It requires less than 200 lbs. slack coal per thousand to burn the very best annealed vitrified shale paving brick. It saves labor—one man can fire the largest kiln.

The Slack is converted into Gas and all the Heat Energy in the Coal is Utilized.

IT IS A SMOKE CONSUMER
AND A PROFIT PRODUCER.

✧ YOU NEED THIS KILN. ✧

WRITE OUR GENERAL MANAGER
FOR FULL INFORMATION.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

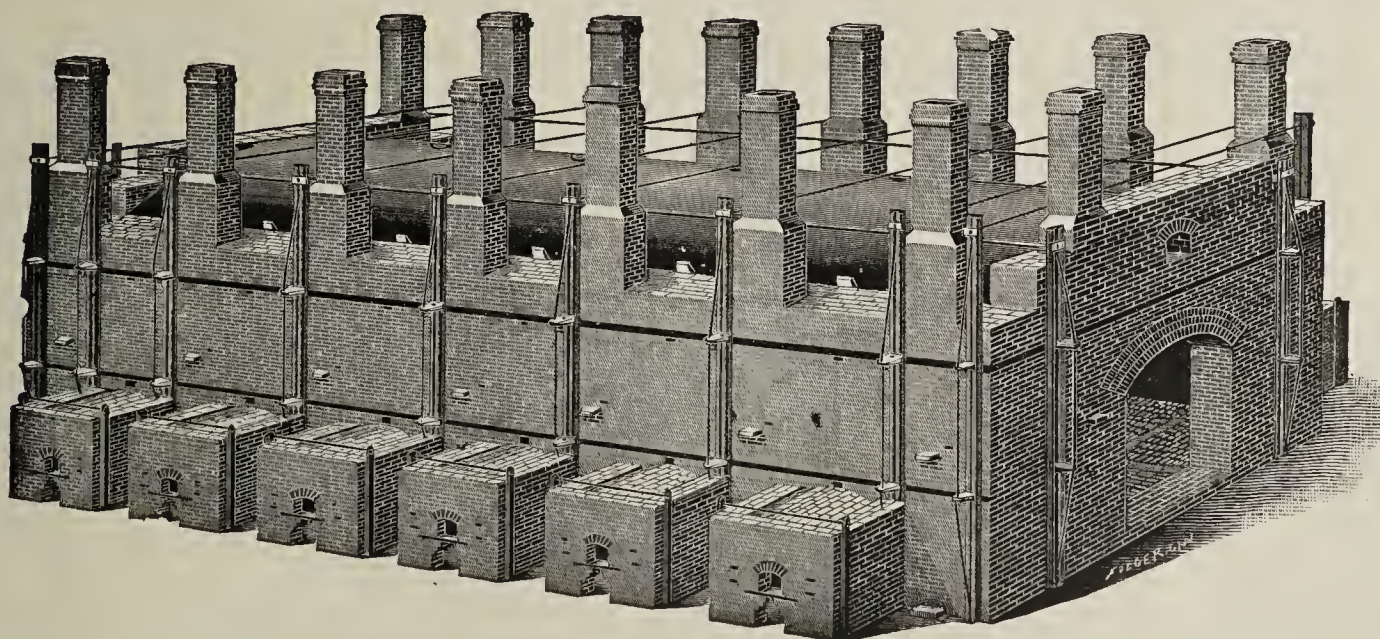
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

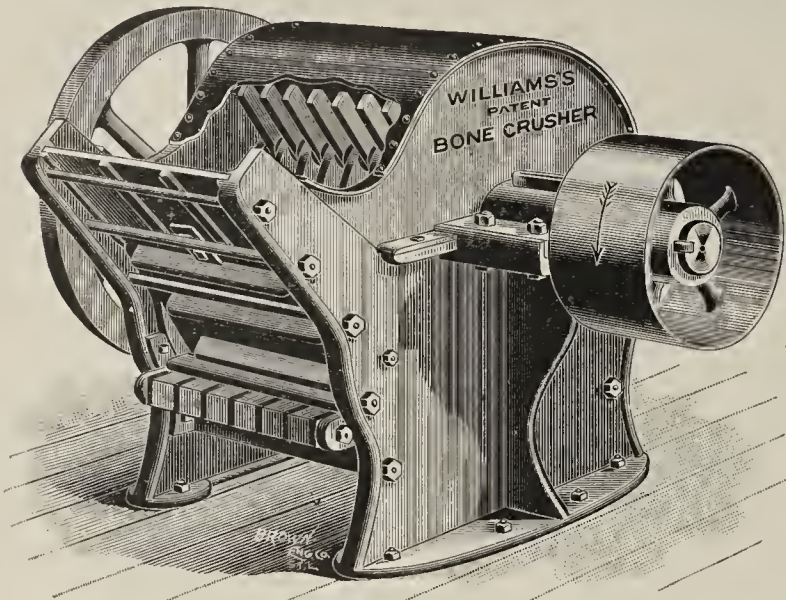
We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

WILLIAMS'S COMBINED SHALE CRUSHER and CLAY PULVERIZER

Our Pulverizer is fully covered by Letters Patent and all Infringers will be Promptly Prosecuted.



Williams's Shale Breaker.

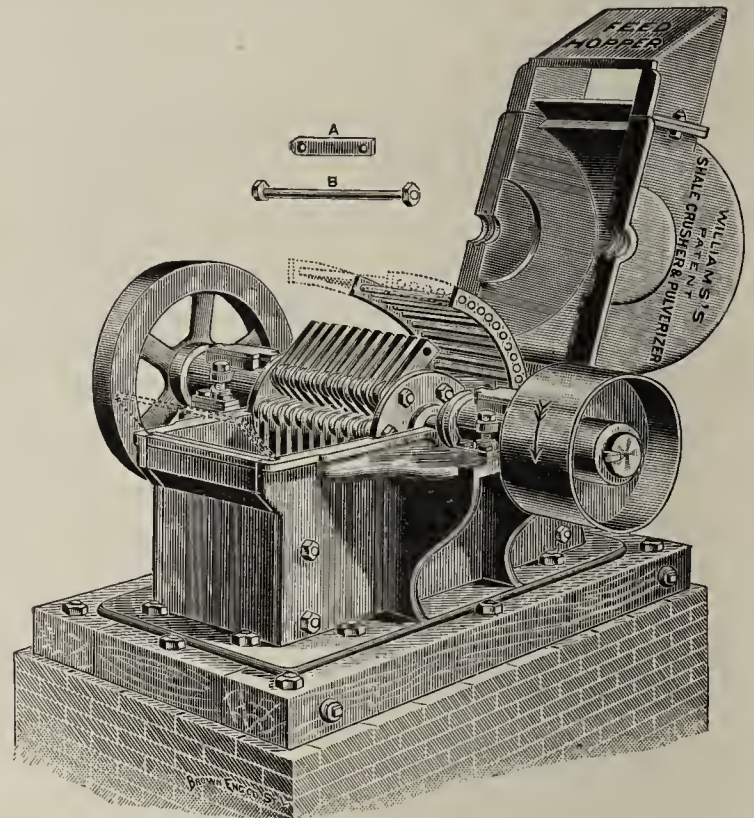
THE above machines will handle shale and clay to better advantage with less power and less cost for repairs than any other machine known.

Will guarantee them under any and all circumstances.

The Williams Patent Crusher and Pulverizer Co.

2705 North Broadway, - - St. Louis, Mo.

EASTERN REPRESENTATIVE, Geo. W. Borton, 700 Fidelity Bldg, Philadelphia, Pa.



Williams's Shale and Clay Pulverizer.

With Clay Steamer Attached.

To all Whom it May Concern.

The AMERICAN CLAY-WORKING MACHINERY CO.,

Replies to the Chambers Brothers Company's Circular in Reference to Decision in Patent Suit for Infringement against J. W. Penfield & Son.

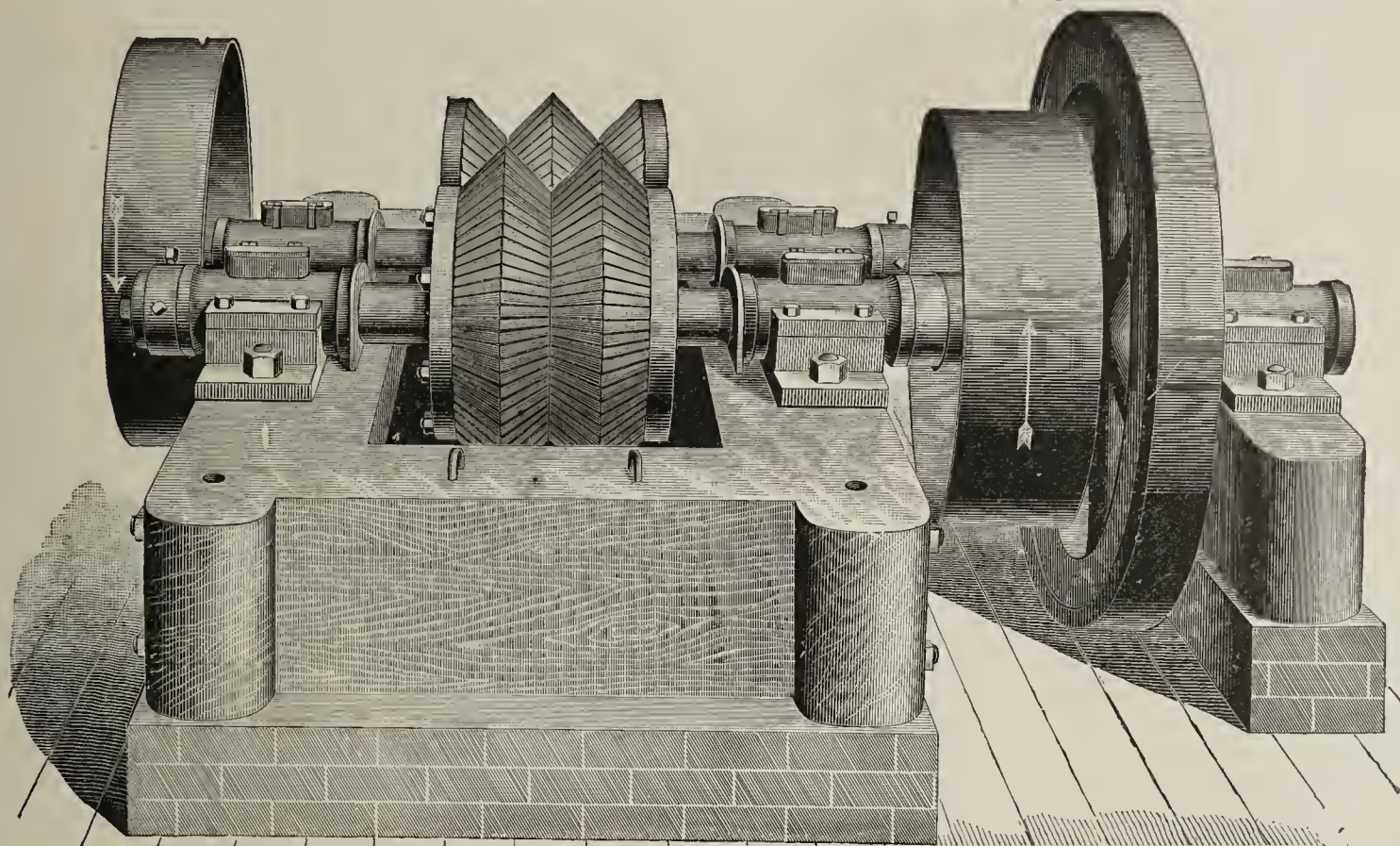
PLEASE READ CAREFULLY:

THE AMERICAN CLAY-WORKING MACHINERY COMPANY, of Bucyrus and Willoughby, Ohio, takes pleasure in informing the trade that all of their modern, best and most important brick machines are entirely unaffected by the decision in the case of Chambers Bros. Co. vs. J. W. Penfield & Son. The circular of the Chambers Brothers Company calling attention to this decision in the case is likely to deceive the unwary. Attempt was made by Chambers to have his endless belt cut-off patents Nos. 297,671 and 297,917, broadly construed to cover all revolving cut-offs. This the Court refused to do, and held that the Penfield Machine did not infringe those claims of the two earlier patents. One machine formerly made by J. W. Penfield & Son was held infringed upon patent No. 362,204, but this is an old style machine. None of that class has been built for the last three years. The American Clay-Working Machinery Co. manufactures and sells to the public Cutting Off Machines under the authority and protection of the O. W. Johnston patent No. 478,346, and the John Thompson patent, No. 496,286, which have not been attacked in the Courts by anybody. It is conceded by Chambers Bros. Co. that our primary wheel cut-off machine, manufactured under Patent No. 391,698, sometimes called the French cut-off, ante dates their patent. This machine we manufacture and are now offering to the trade. In addition to the cut off, manufactured under the Johnson patent, No. 478,436 and the Thompson patent, No. 496,286 and Frey patent No. 391,698, we manufacture the Automatic Side Cut-off, the Semi-Automatic Cut-off, the Hand Cut-off, the Combination Cut-off, the Galesburg End-cut Machine and the Frey Wheel End Cut-off Machines. Also machines so arranged as to work satisfactorily, either for end-cut or side-cut brick—none of which are claimed to infringe the Chambers patents. It is not disputed by any one that the American Clay-Working Machinery Co. owns and controls the fundamental patents on this side-cut-off class of machines. Their superiority over the end-cut machines of the Chambers class is too well known and recognized by brick manufacturers to need further comment. Our legal counsel, Messrs, Wood & Boyd, of Cincinnati, Ohio, advise us that our present machines are not infringing any of the claims involved in the Chambers suit. We believe their advice to be sound—therefore we guarantee all parties purchasing and using brick and tile cut-off machines made by us, to hold them harmless from all loss, costs or damages by reason of any alleged infringement of said Chambers patents.

The AMERICAN CLAY-WORKING MACHINERY CO., Bucyrus, Ohio.

NEWELL IMPROVED CLAY PULVERIZER

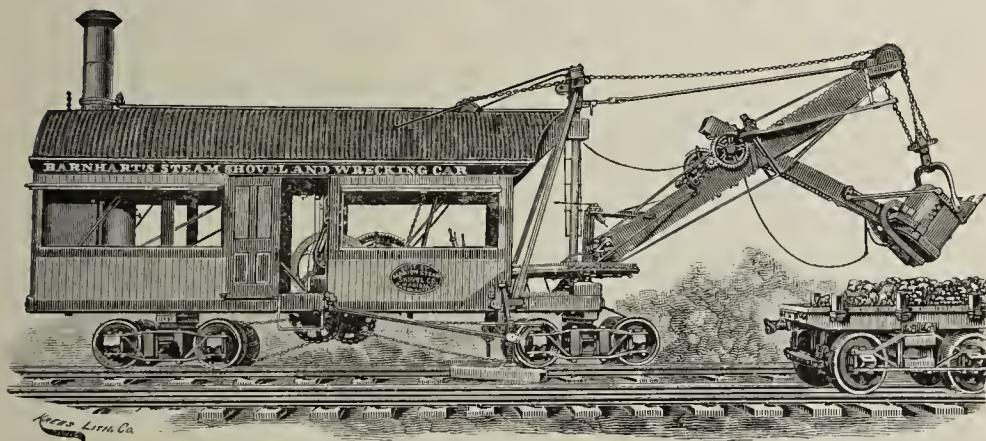
Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermyer Building, New York, U. S. A.
26 Cortland and 21 Dey Streets,

Steam Shovels for Brickyards.



STYLE A-1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

603 West Center Street, - **MARION, OHIO.**



STYLE C-¾ YD.

OUR large size steam shovels have a capacity equal to anything of this kind ever offered to the public and embody all the improvements to be found in excavating machinery. They are self-propelling and are particularly adapted for use in the larger brickyards. By the use of these machines, a much better brick can be made from the same material, beginning as it does, at the bottom and working up the bank until dipper is full. The different stratas of clay are thoroughly mixed which, in most yards, is an important feature. Our Excavators are no experiment, being used in all the principal brickyards of Chicago.

Do You Want A BRICK MACHINE A DRY PAN A PUG MILL?

IF SO DON'T FAIL TO

Get
Our
Prices,



They
Can't
... be
Beat.

.....

WOOLLEY'S MACHINERY is built on mechanical lines and of the best material. Our "**Iron King**" is a non-breakable brick machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ability of every part.

We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

It will afford us pleasure to correspond with you.

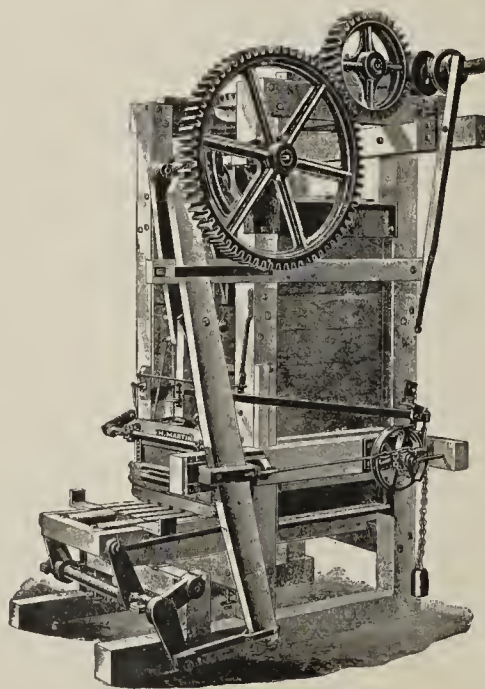
Mention the Clay-Worker

The "**HENRY MARTIN**" **BRICK MACHINES**

Are Manufactured **ONLY**

We carry in stock at all times
a large line of...

BARROWS,
TRUCKS,
MOULDS,
KILN CASTING and
General Brick Yard
Supplies.

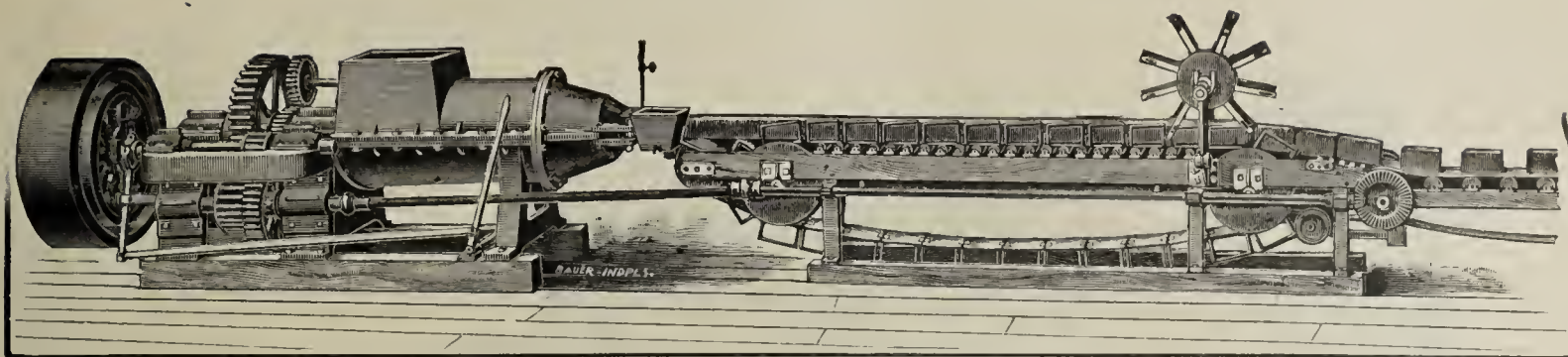


We are prepared to equip a
BRICKYARD complete,
and furnish the detail plans
for the entire construction
of the plant.

WRITE US for prices be-
fore purchasing elsewhere.

BY THE

HENRY MARTIN BRICK MACHINE MFG. CO., LANCASTER, PA., U. S. A.



DANVILLE, ILLS, August 12th, 1897.

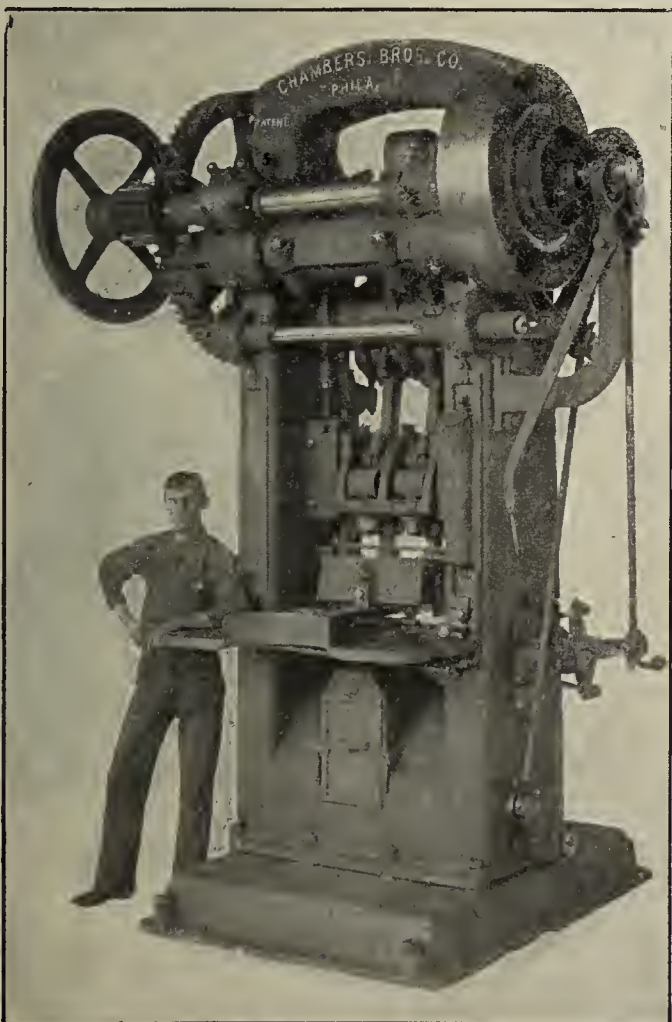
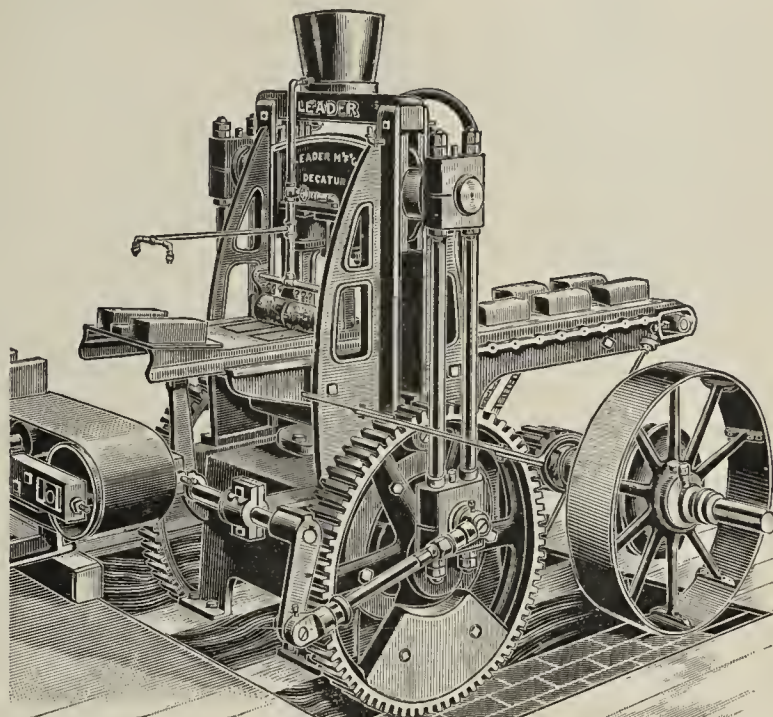
LEADER MFG. CO., Decatur, Ill.

Gentlemen:—We have been using two of your double power represses for nearly two years. Although the presses are in constant use (as we repress all of our product), we have had no trouble with them; both the quantity and quality of the work is entirely satisfactory. About three years ago we began with and used another make until we saw yours at work, when we substituted yours for the old ones, and we find we made a good investment. For strength, durability and simplicity we think THE LEADER RE-PRESS has no equal.

Yours truly, DANVILLE BRICK AND TILE CO..
J. G. SHEA, President.

We have pleased several and can please you. Complete line of new, and bargains in second-hand machinery.

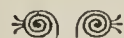
Leader Manufacturing Co.,
Decatur, Ill.



The Chambers Power Repress

...For Plastic Brick...

A STRONG, stiff, machine, with all the pressing machinery above the mould-box and away from the dirt. Steel-faced cams and hardened steel cam-rollers. Main shaft bearings made with long sleeves. Cross-head guides fitted with adjustable bronze gibs. The finished brick is delivered upon a plate, and is never touched by the incoming clot, which is placed in exact position and cannot be shaved. During the initial pressure any surplus clay in the clot is expelled, and all brick thus gauged to uniform thickness, following which all openings are closed and the finishing pressure applied in a practically tight box. The product is repressed, tempered clay brick, free from blemish arising from method of delivery, and of practically uniform density and thickness. The pressure applied to each brick can be regulated at will. **Weight about 14,000 pounds.**

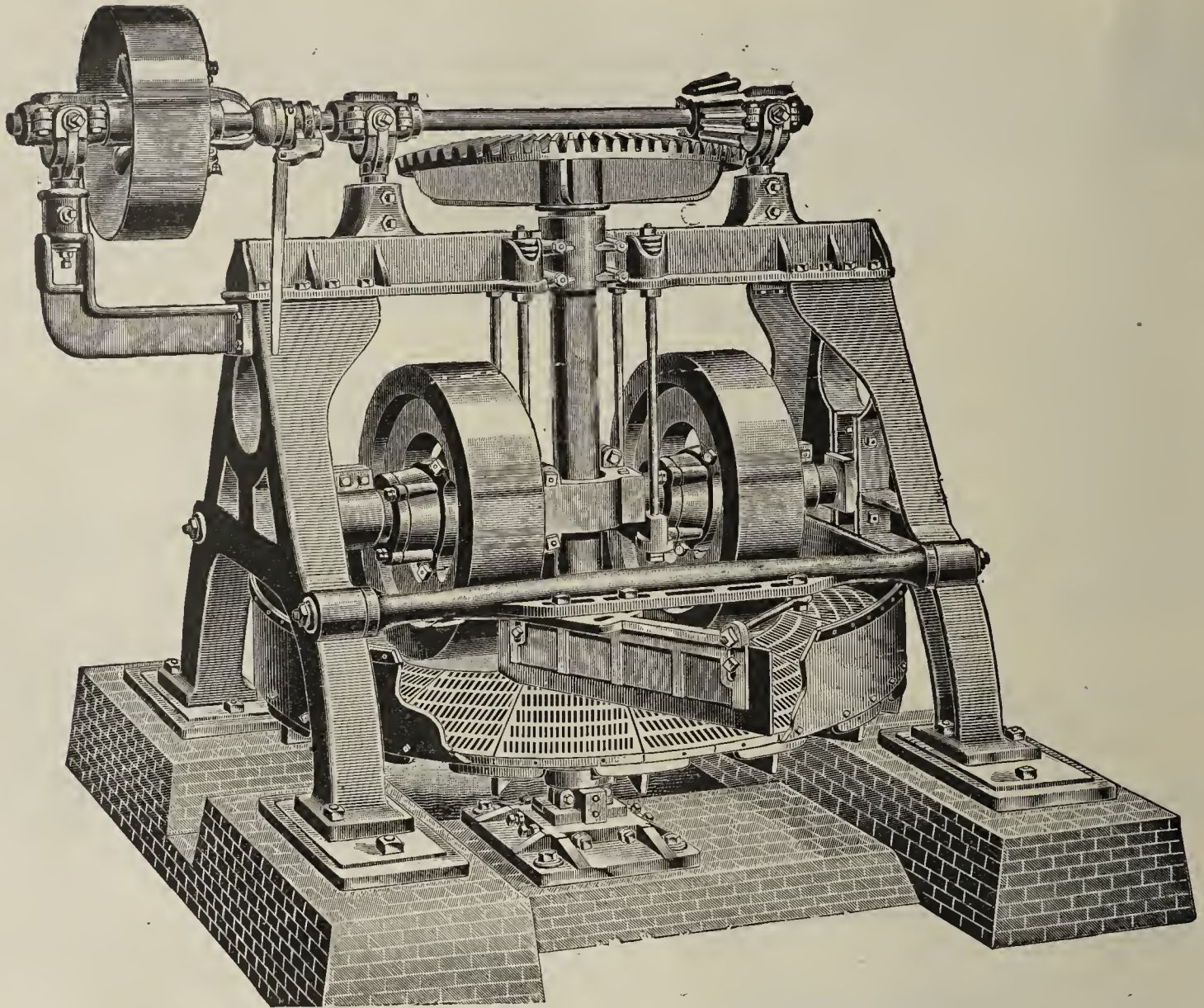


Manufactured by **Chambers Bros.' Co.**

Fifty-Second St.
Below
Lancaster Avenue.

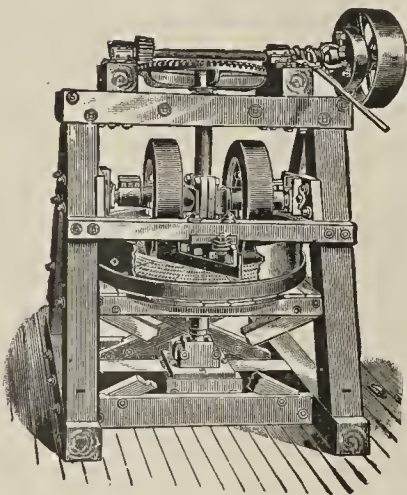
Philadelphia, Pa.

U. S. A.



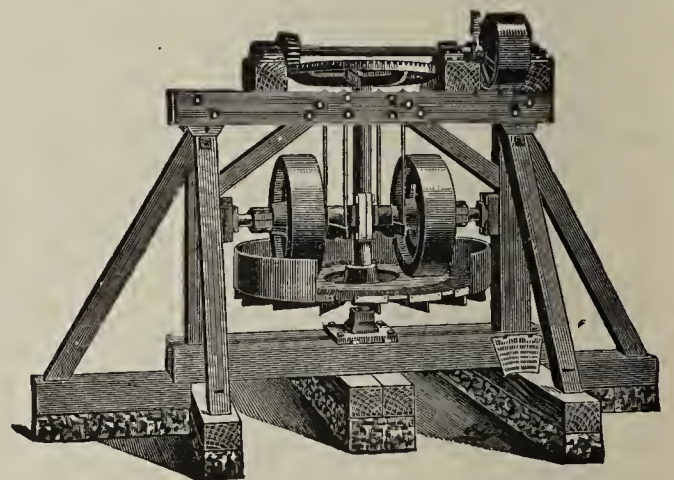
OUR SPECIALTY IS

DRY PANS.



IRON FRAMES,
WOOD FRAMES.

~~~~~  
All Sizes and Price  
to suit  
Any Size Plant.  
~~~~~



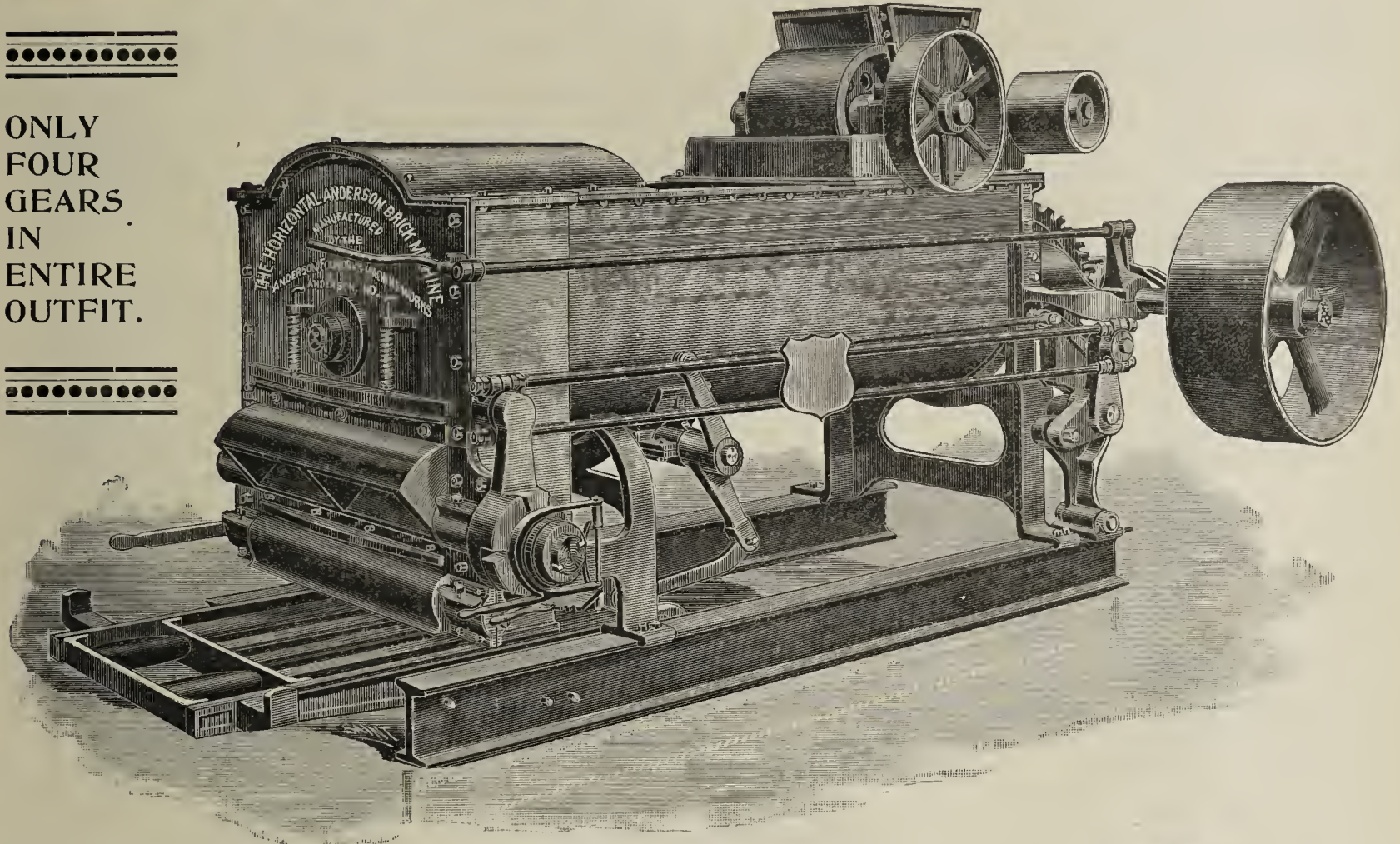
.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

FROST ENGINE CO., Galesburg, Ill.,
U. S. A.

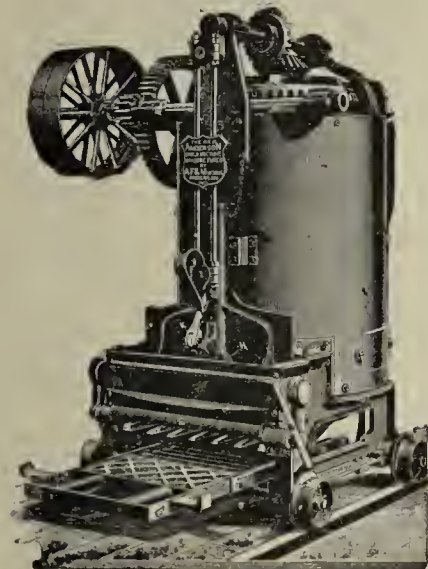
DON'T

Buy a Brick Machine until you Investigate the **HORIZONTAL ANDERSON**. The latest — the Strongest — Greatest Pressure and Pugging Capacity.

ONLY
FOUR
GEARS
IN
ENTIRE
OUTFIT.

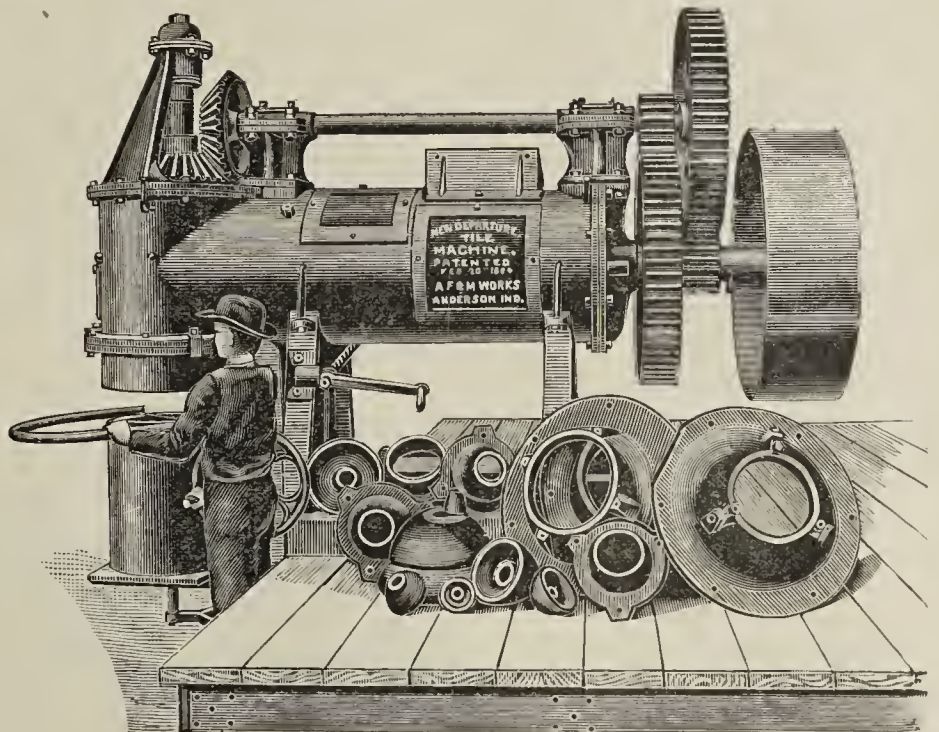


Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

The NEW DEPARTURE TILE MILL.

The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana

Good Opinion

Of an Ex-President of the N. B. M. A., and "Brickmaker to the President of the U. S."

This letter is only one of many received of the kind. Once you have used a **POTTS HORIZONTAL STOCK BRICK MACHINE**, you would not use any other if it were given to you.

OFFICE OF
ADAMS BRICK CO.,
Builders Exchange.

Manufacturers of Building, Sewer and Paving Brick.
Made from Shale or Clay.

WORKS:--Martinsville, Ind.

Indianapolis, Ind., Oct. 5th, 1897.

C. & A. Potts & Co.,

Gentlemen:--You may enter our order for one of your all iron horizontal stock brick machines; one No. 2 "A" disintegrator; one mold sander and one belt elevator. The outfit herewith ordered is to be used at the plant we are now constructing at Martinsville, thirty miles southwest of Indianapolis on the I & V branch of the Pennsylvania Railroad, the same to be furnished at your earliest convenience. While engaged in the manufacture of brick at Sheridan, Ind., we used two of your horizontal soft mud machines for several years, which gave us very satisfactory results, in the facility and ease with which we operated them, as well as the character of the product they turned out. Therefore, in awarding your firm this contract, we feel justified in expecting a first-class equipment, which will make a brick from our clay and shale equal in every respect to any produced in the country. As you well know, we have had the erection of this plant in contemplation for several months, and for the purpose of securing the best, most substantial and most easily operated soft mud machines, we have visited many of the largest and best equipped yards of the central West, and after a thorough examination of the several horizontal machines which we saw in operation, I can say without prejudice that we are confirmed in the belief that your all iron brick machines is the BEST in WORKMANSHIP, SIMPLICITY and WEIGHT of those which I saw.

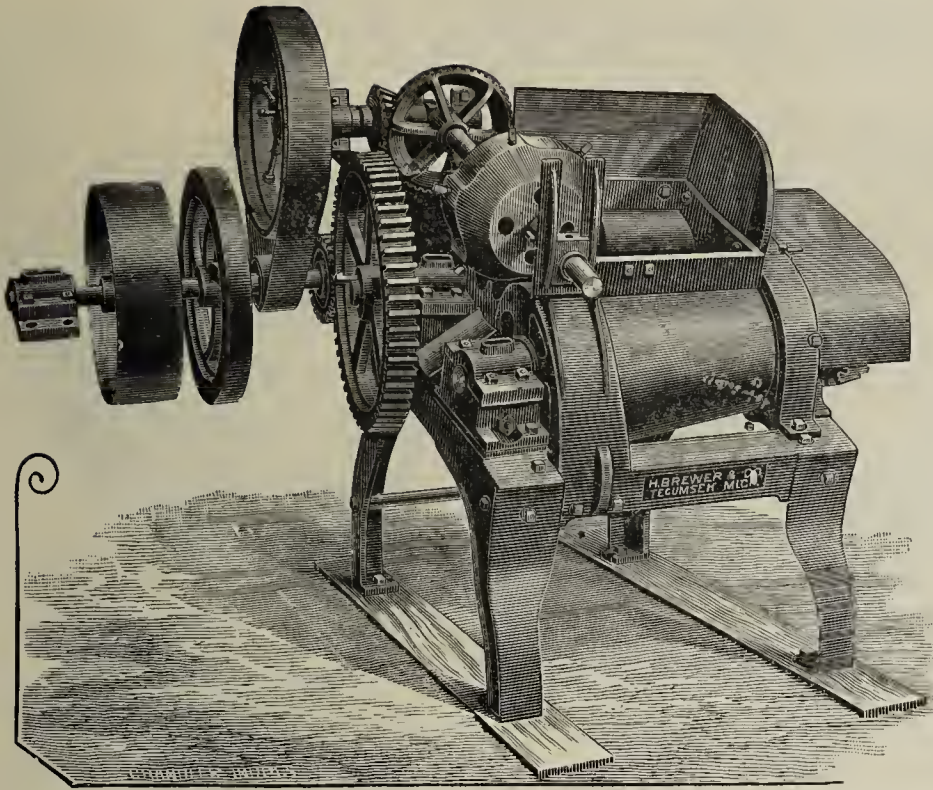
Very truly yours,

ADAMS BRICK CO.

J. C. Adams, President.

You will make no mistake when purchasing a brick machine, if you place your order with C. & A. Potts & Co. Their machinery has stood the test and is now in use on the largest and best equipped plants in the United States. Write for prices and terms.

C. & A. POTTS & CO.,
816-828 West Washington St., INDIANAPOLIS, IND.



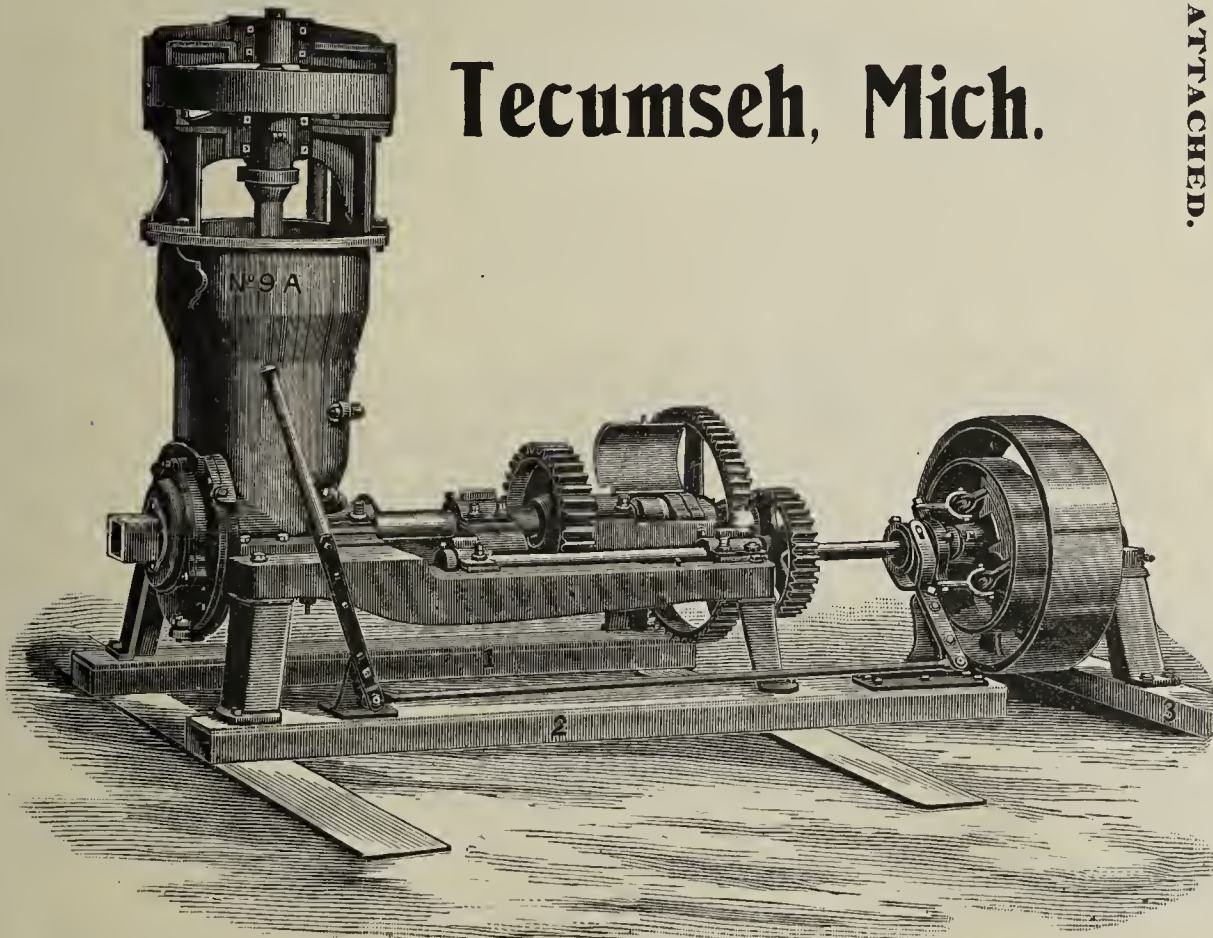
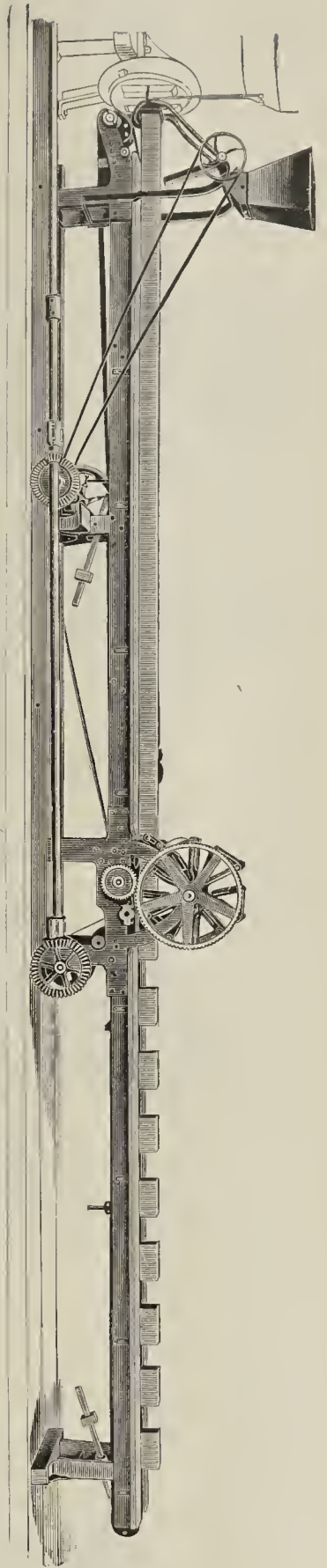
STONE EXTRACTING CLAY CRUSHER.

Manufactured by

H. Brewer & Co.,

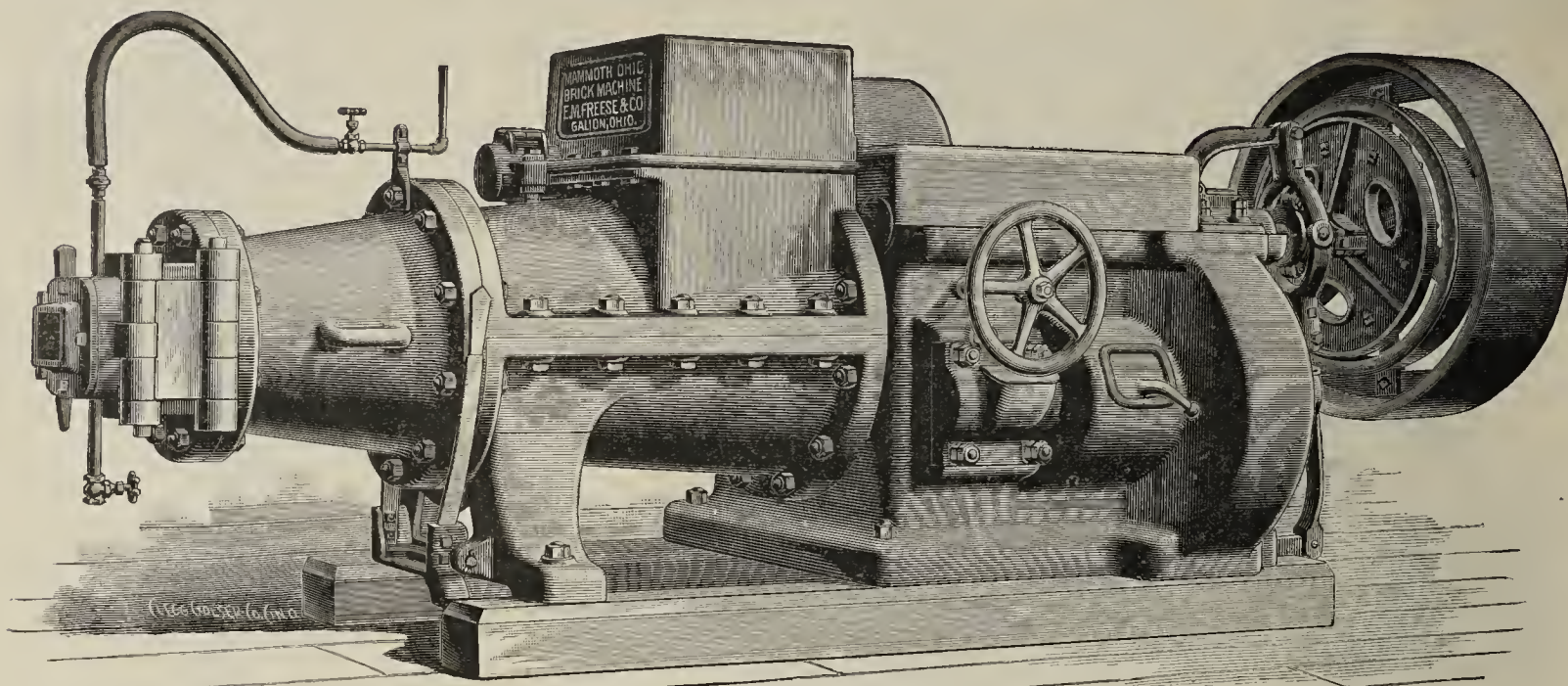
Tecumseh, Mich.

AUTOMATIC END CUT BRICK CUTTER WITH SANDER ATTACHED.

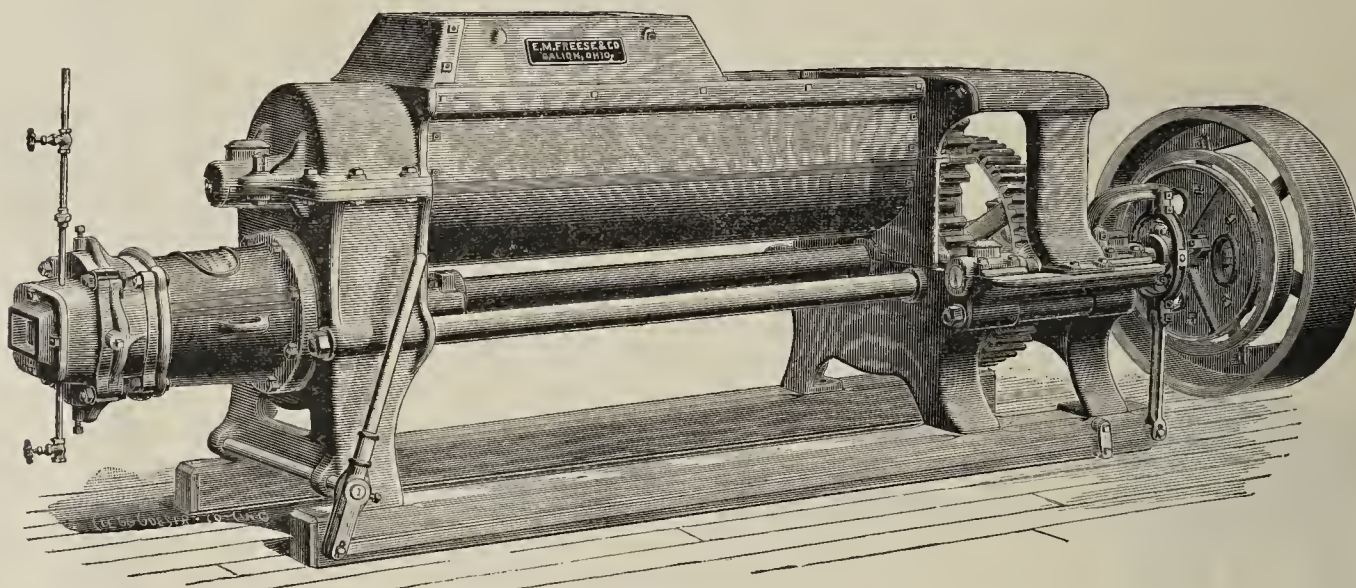


No. 9 "A" BRICK MACHINE.

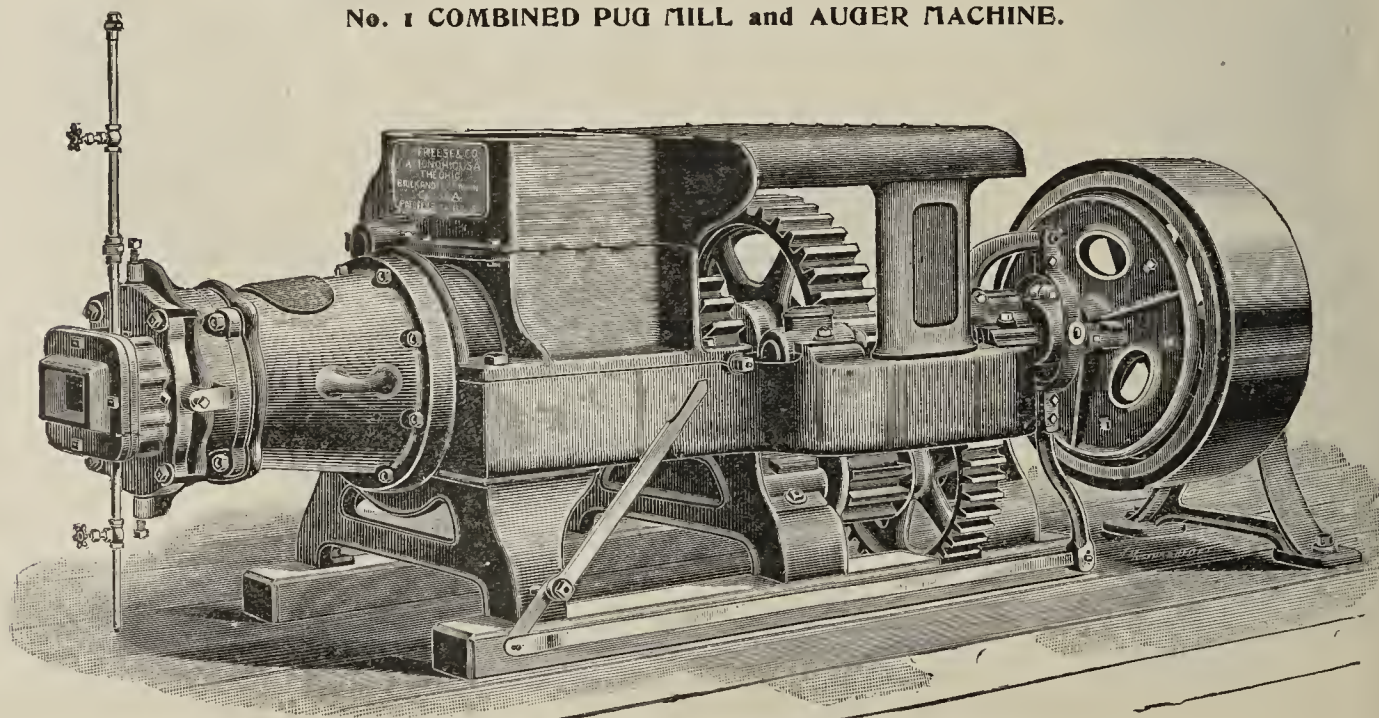
E. M. FREESE & CO., GALION, OHIO.



MAMMOTH BRICK MACHINE.



No. 1 COMBINED PUG MILL and AUGER MACHINE.



IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

Send for 136 page Catalogue.



IF YOU WANT TO

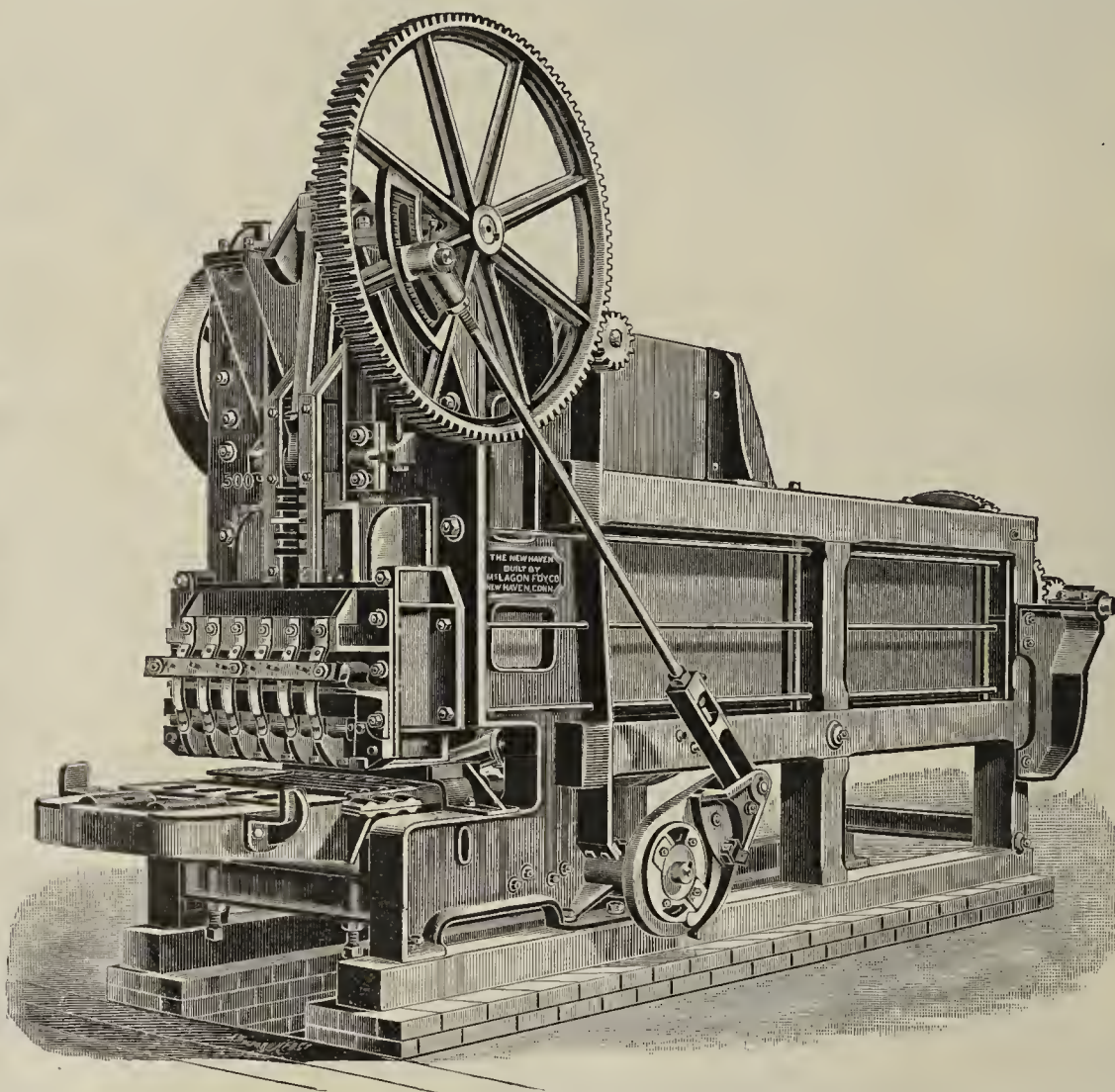


Hold the "Winning Hand" in machinery you should get our line. It's built right and runs right. Each machine is a "trump card" in construction, operation and ability to work at a profit. We manufacture every machine known to the Clay Trade. Write for information.

The AMERICAN CLAY-WORKING MACHINERY CO., Bucyrus, Ohio, U. S. A.

“New Haven” Brick Machinery,

Solid, Strong, Substantial Structures.



Soft Clay Ma-
chinery is Our
Specialty.

..

We propose to
Please each Pa-
tron.

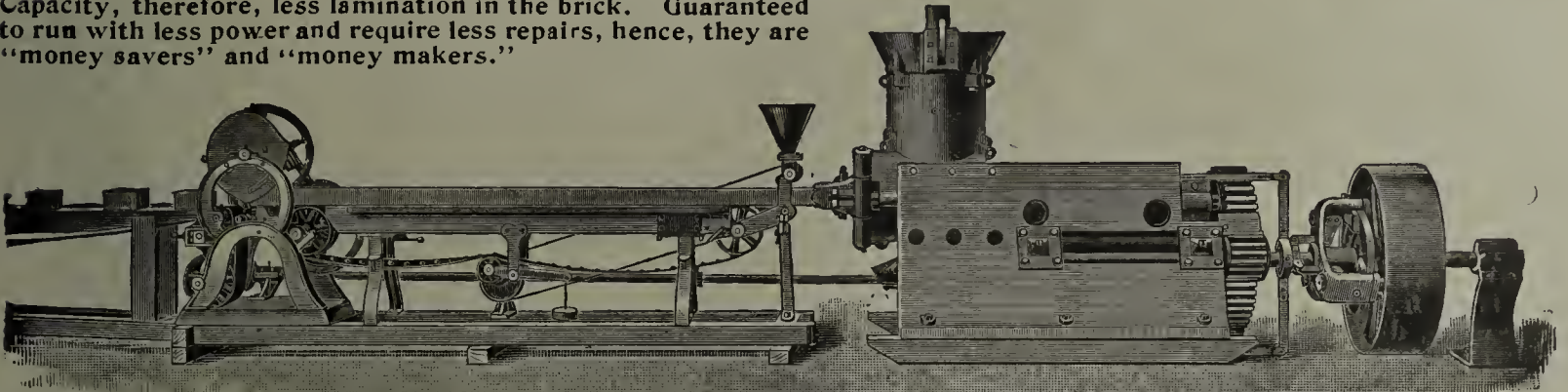


SEARCHING INQUIRY SOLICITED.

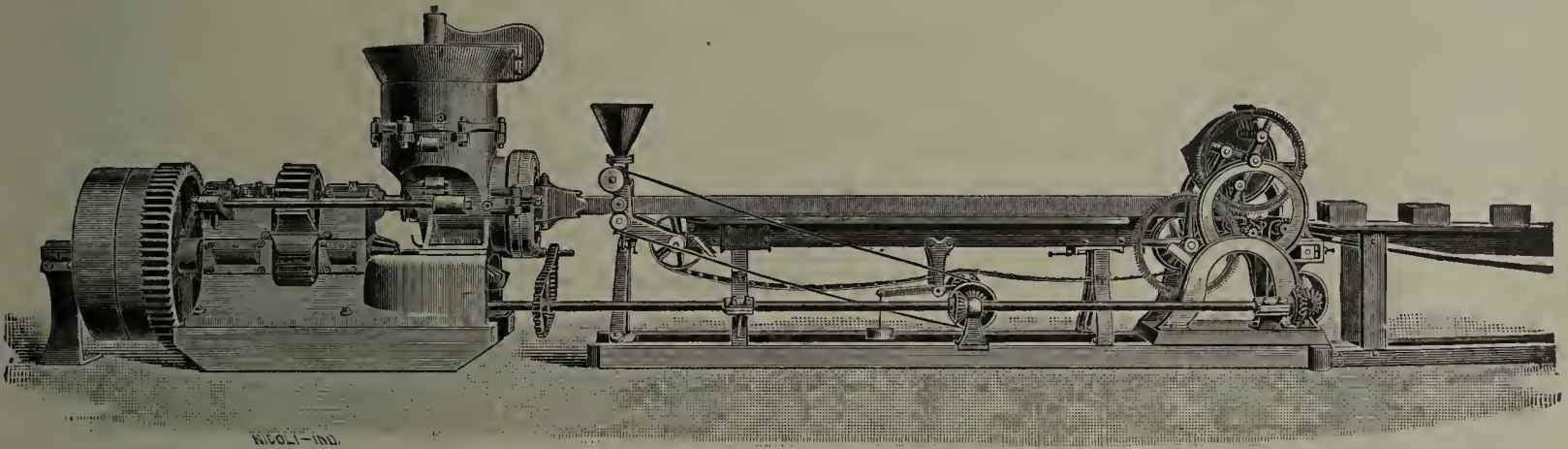
The Eastern Machinery Co.,
NEW HAVEN, CONN.

WONDER MACHINERY.

THE WONDER BRICK MACHINES have a Great Puging Capacity, therefore, less lamination in the brick. Guaranteed to run with less power and require less repairs, hence, they are "money savers" and "money makers."



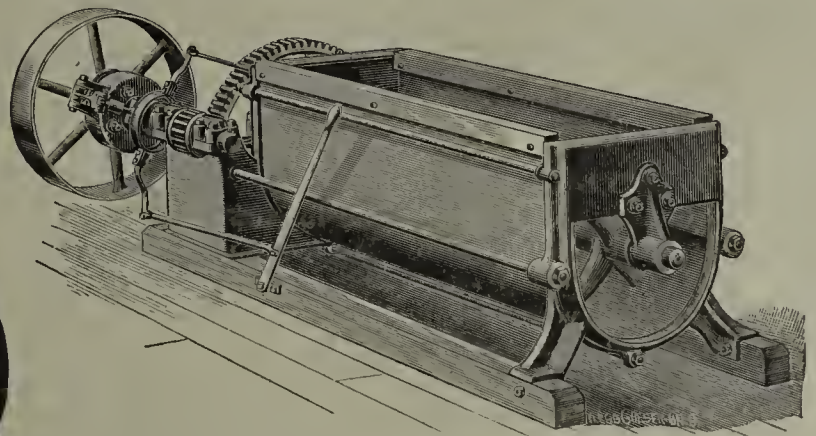
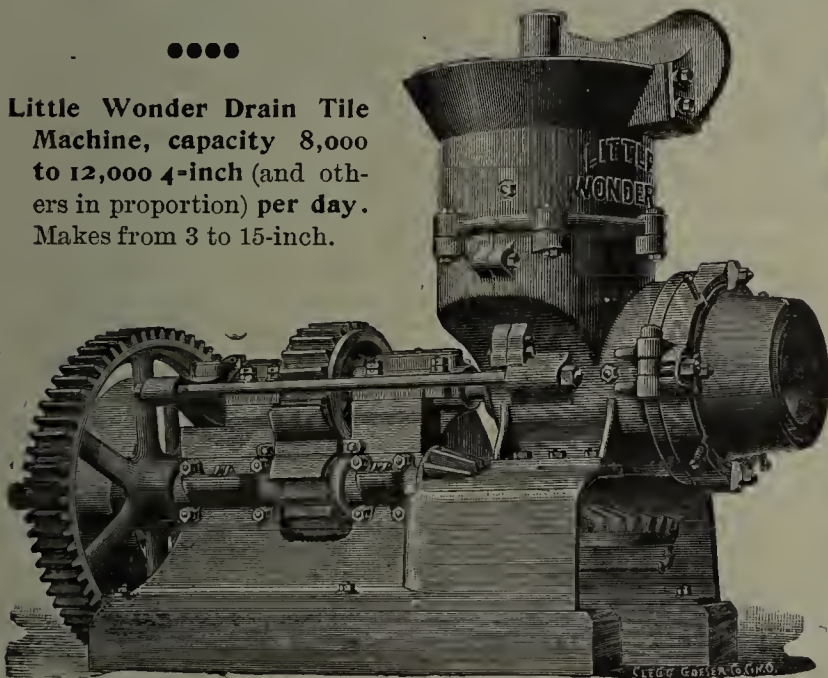
Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.



Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

•••••

Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity.

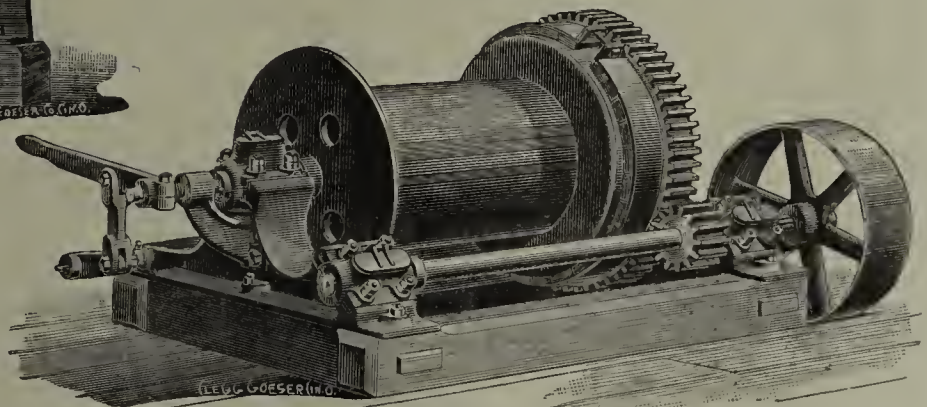
MANUFACTURED BY

The Wallace Mfg. Co.,
Frankfort, Ind.

CHICAGO AGENT:

Chicago Brick Machinery Co., Chicago, Ill.

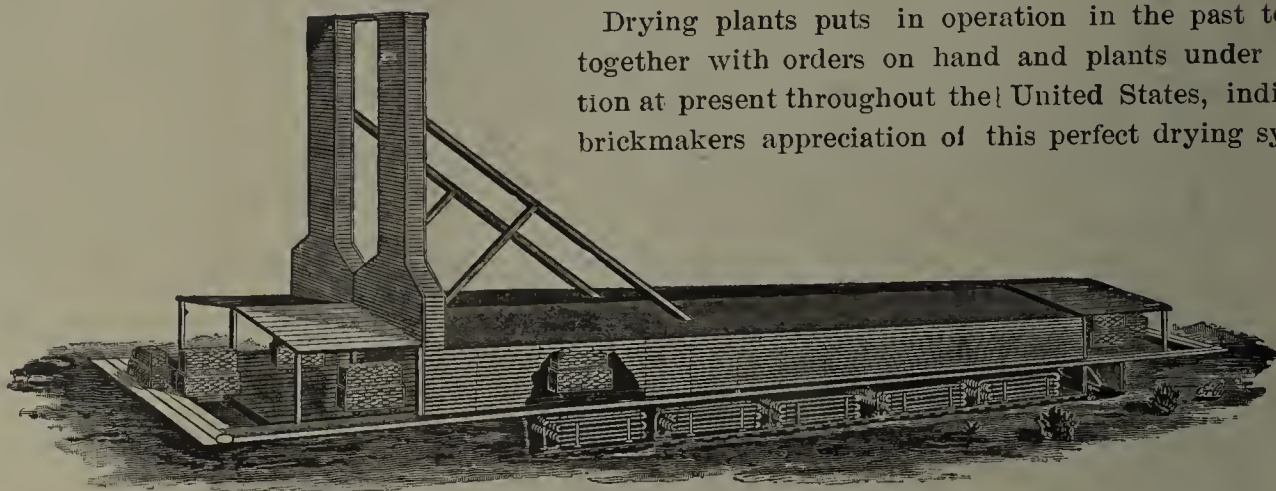
Catalogue Free.



18 x 30 Friction Geared Hoisting Drum.

Iron Clad Dryer.....IN THE LEAD

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

•SEE WHAT THEY SAY:•

WM. SANKEY, THOS. SANKEY,
WM. E. SANKEY, F. M. SANKEY,
T. H. SANKEY, J. F. SANKEY.

CAPACITY: 40,000 BRICK PER DAY.

TELEPHONES: { OFFICE, S. S. 11-3.
WORKS, S. S. 11-2.
WORKS, E. E. 589

SANKEY BROS., BRICK.

ORNAMENTAL PRESSED, SELECT STOCK, BUILDING, PAVING AND GUTTER BRICK.

SPECIAL AGENTS FOR MARTIN'S IMPROVED BRICK MACHINE.
RAILROAD SHIPPING A SPECIALTY.

OFFICE: 2101 Carson Street.

WORKS: Head of 18th Street, S. S.
Penn and Atlantic Aves., E. E.

PITTSBURGH, PA., May 3, 1897.

WOLFF DRYER CO., Chicago, Ill.

Gentlemen:—Replying to your inquiry regarding dry house at our east end plant, will say, that it is two years since we equipped that yard. We found the earthy deposit there would make the best quality of stock brick; soft mud process, but would not stand direct heat drying; such as we were accustomed to use, therefore concluded to test this brick in your dryer, resulting in our installing your system, producing results of a most satisfactory nature, proving the excellence and correctness of your system of absorbing moisture from centre to surface by drawing a volume of warm air through the brick, carrying off the moisture and leaving our brick perfect and bone dry, saving us money in burning and producing beautiful color.

Six months experience proved to us that it would pay to install your system at our South side works, which we did one year ago, with equal satisfaction. At this yard, we have shale clay manufacturing soft mud and dry-press brick and was equipped with the best kind of dry floor, heat supplied from natural gas; we sacrificed this and built an Iron-Clad under the same roof. This loss has been our gain; the quality of brick and saving in cost of drying enables us to show a fair profit, which is very pleasing, considering prevailing low prices for brick. We dry all our dry-press brick before setting in the kiln.

Respectfully yours,

SANKEY BROTHERS.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

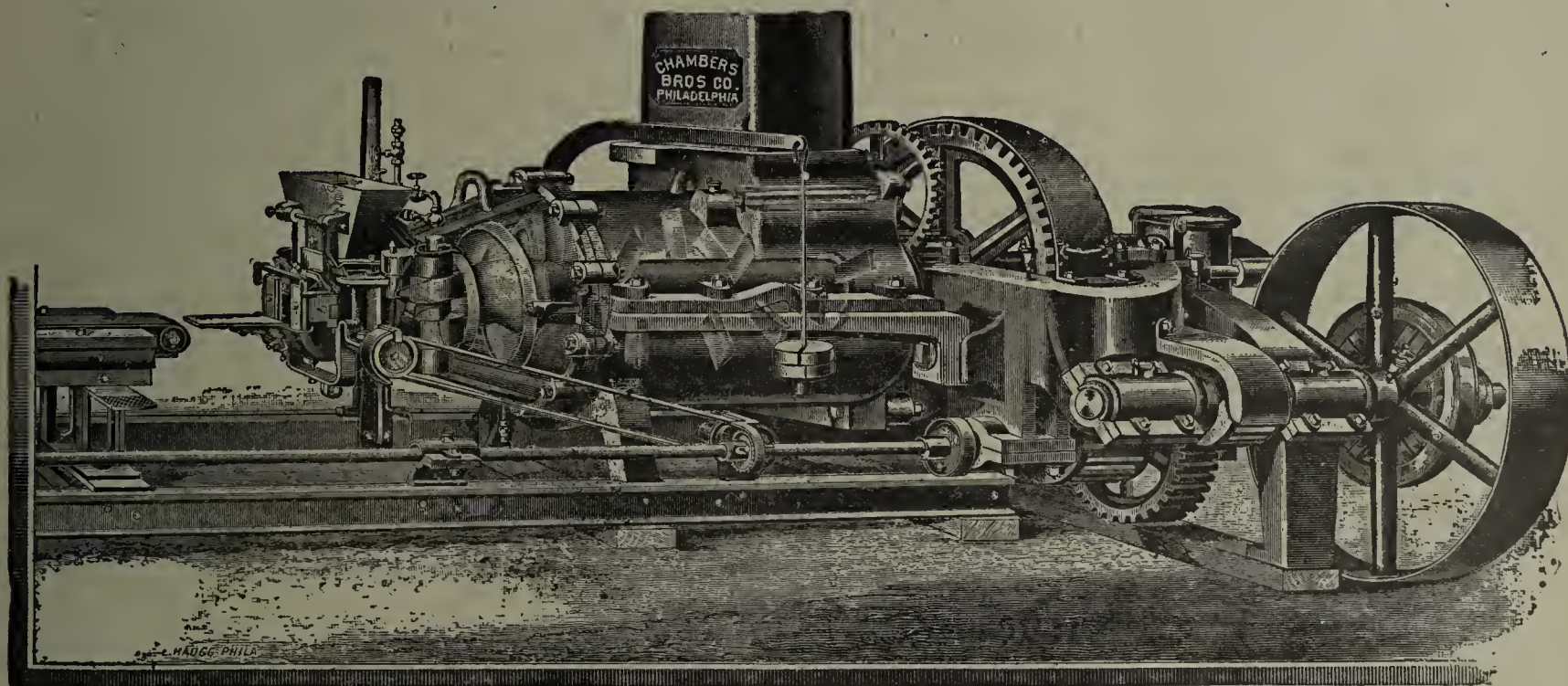
VOL. XXVIII, No. 5.

INDIANAPOLIS, IND., NOVEMBER, 1897.

\$2.00 a Year in Advance.

OUR SPECIALTY IS STIFF TEMPERED BRICK MAKING ...MACHINERY.

We aim to Build only the Best in its Class.
It has Paid our Customers to Buy and Use our Machines.
We Believe it would Pay You.



Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,

171 South Canal Street.

PHILADELPHIA, PA.

No Brickmaker

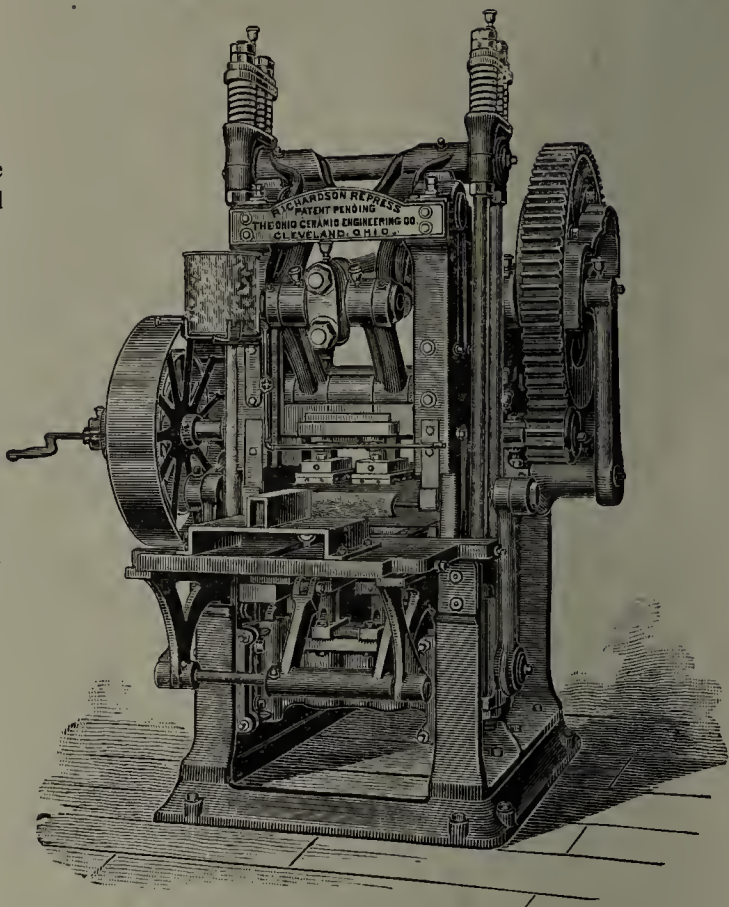
Will buy four Represses of the same make unless the machine is a good one.

....

Four

That's our record with the
SAYRE & FISHER CO.,
of Sayreville, N. J.

They had three of our machines and
have just ordered a fourth.



Let us tell you about the simplest and most serviceable Repress on the market.

The OHIO CERAMIC ENGINEERING CO., = = Cleveland, Ohio.

Brick Moulds at a Discount.

On and after June 1st, you can get 20 per cent off the list on Machine Moulds and other supplies, at reduced prices. If you have not got the LIST, send for it. Address the largest and most complete works of the kind in the world.



3 Brick Hand Mold.



6 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

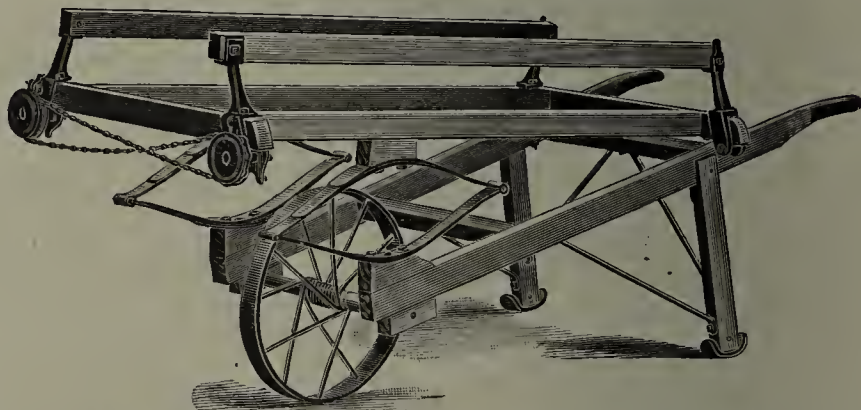
We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

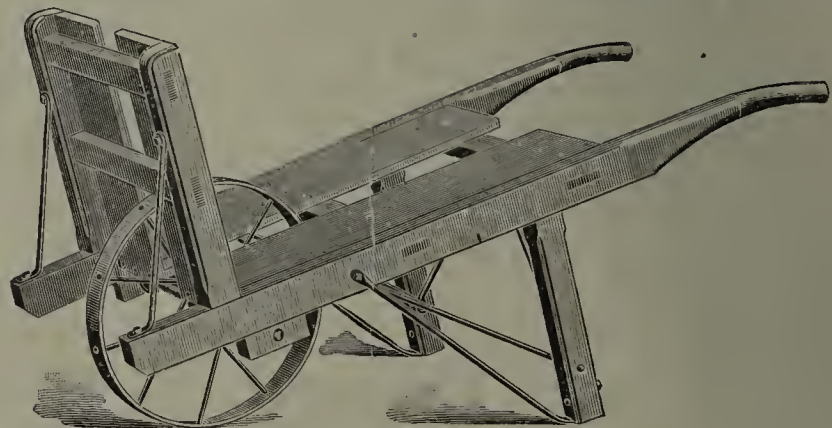
Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

Send for catalogue and price list. Address,
D. J. C. ARNOLD, New London, Ohio.

TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market.
For various purposes. Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind



No. 4 Brick Barrow.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.

IF YOU NEED..

Wooden Pallets,

WE CAN FURNISH YOU THE BEST.

We make all Styles of

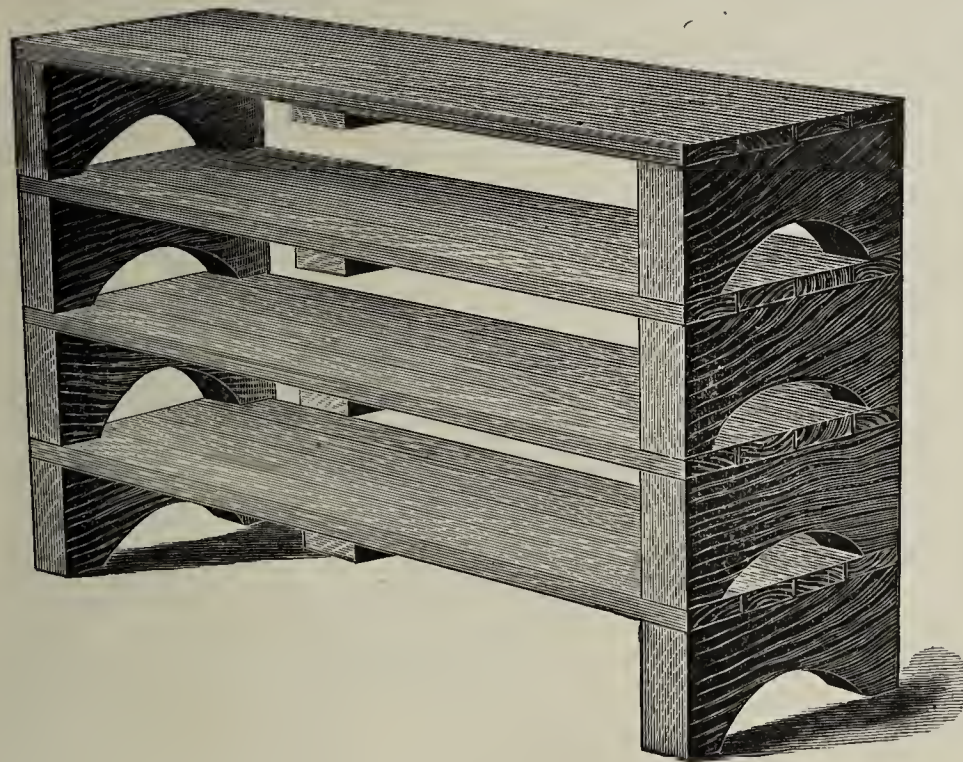
Rack Pallets,

Hacking Pallets,

Pallets for Dryers,

Also Decks for Dry Cars.

We can ship them anywhere.



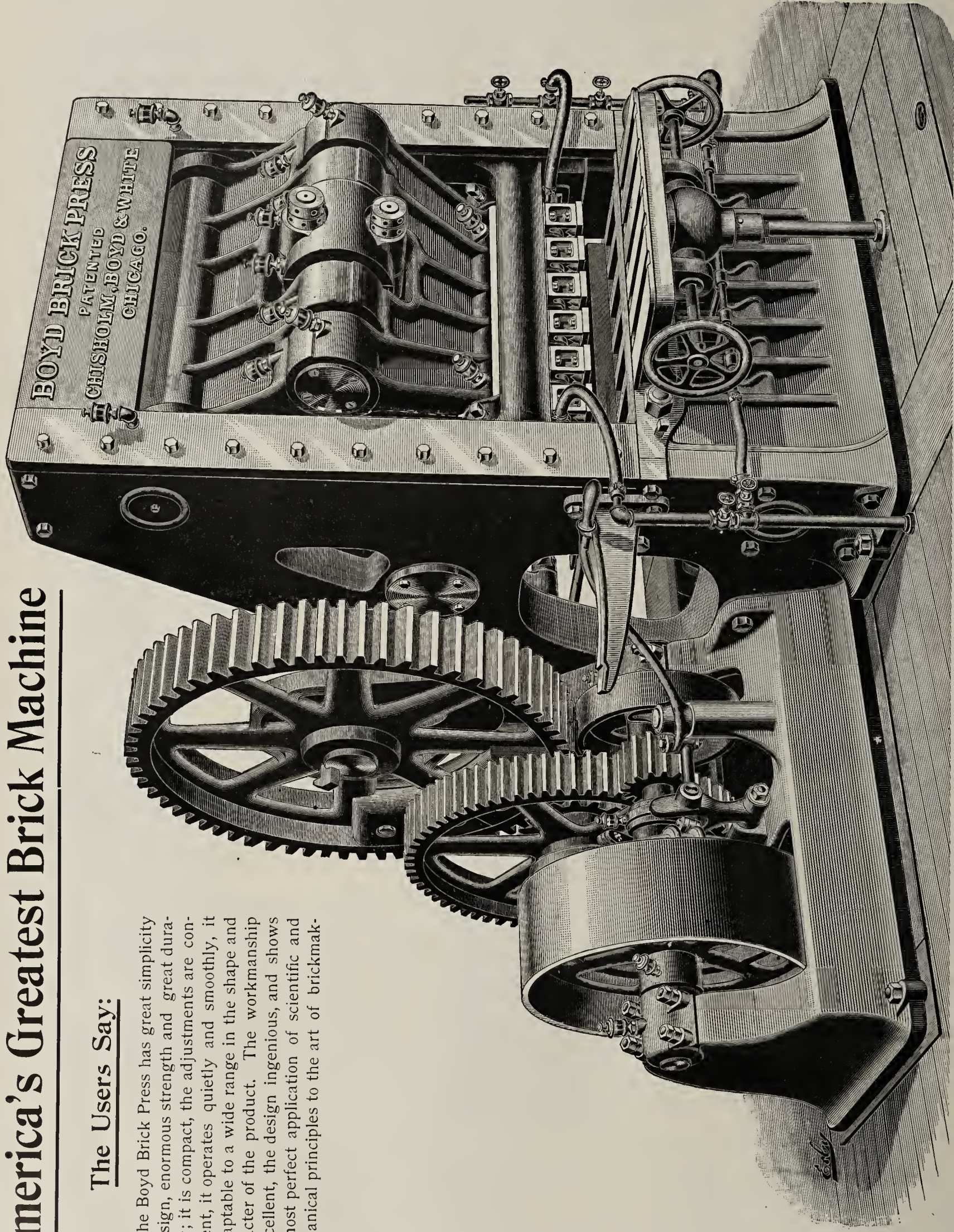
Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., - Saginaw, East Side, Mich.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

CLAY WORKING MACHINERY

The Simpson Brick Press, The World's Standard.

Used by the most successful brickyards throughout the United States and Canada.

We manufacture a complete line of Clay-working machinery.

Do not experiment. Invest your money in a **SURE THING.**

Complete plants constructed and guaranteed. Write for catalogue.

The Simpson Brick Press Co.,

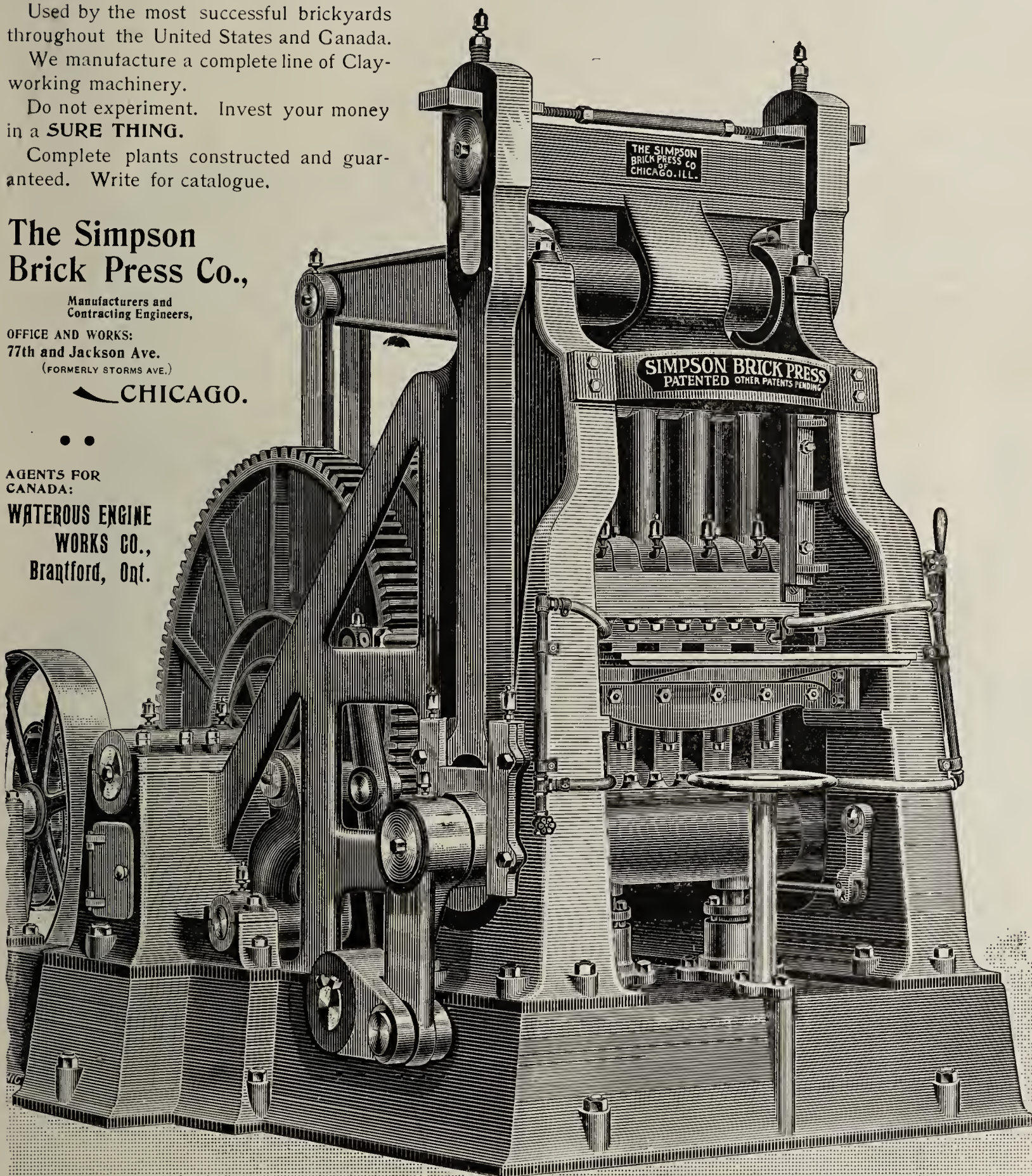
Manufacturers and
Contracting Engineers,

OFFICE AND WORKS:
77th and Jackson Ave.
(FORMERLY STORMS AVE.)

CHICAGO.

AGENTS FOR
CANADA:

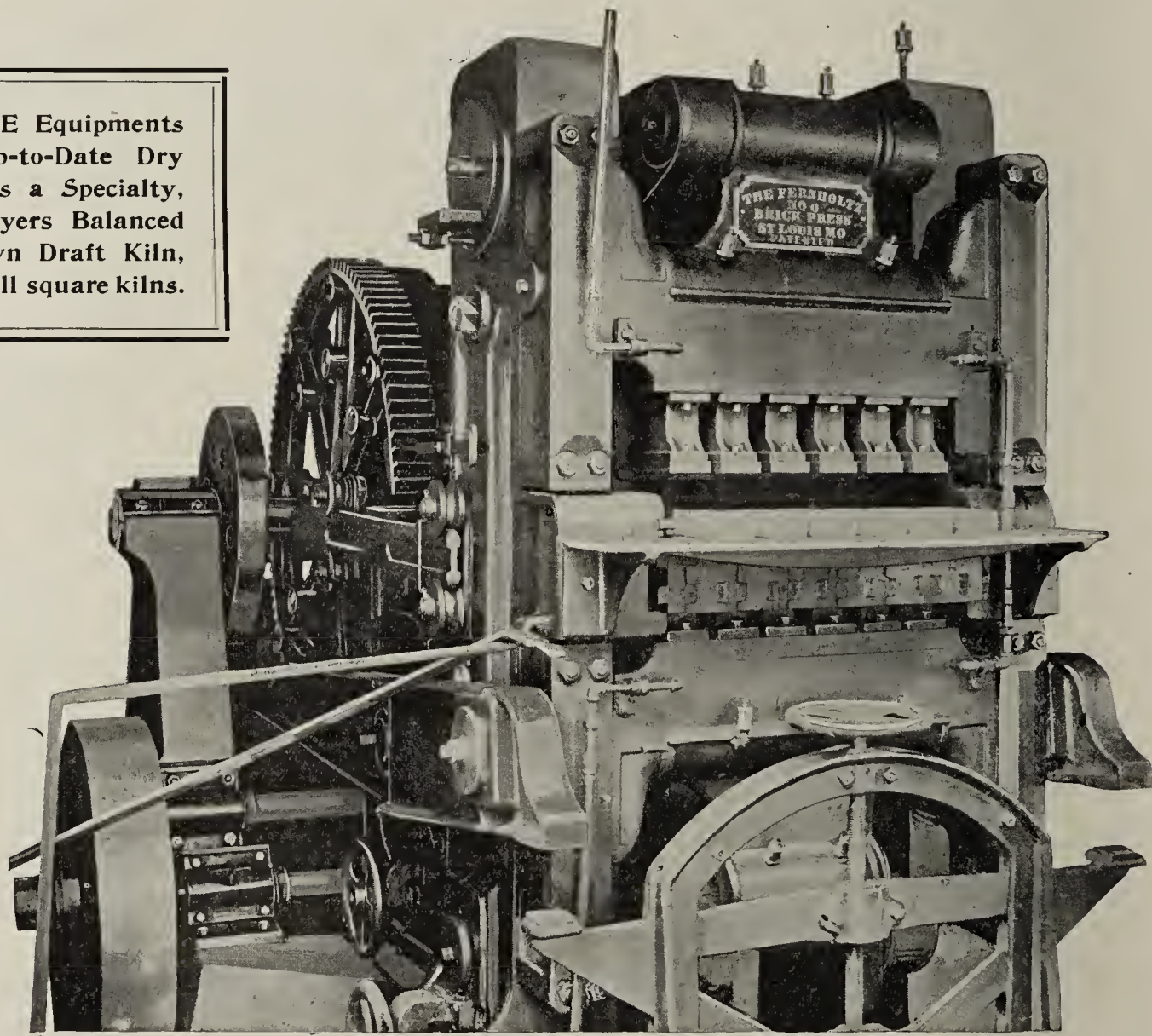
WATEROUS ENGINE
WORKS CO.,
Brantford, Ont.



The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMplete Equipments
for Up-to-Date Dry
Press Plants a Specialty,
including Myers Balanced
Up and Down Draft Kiln,
The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

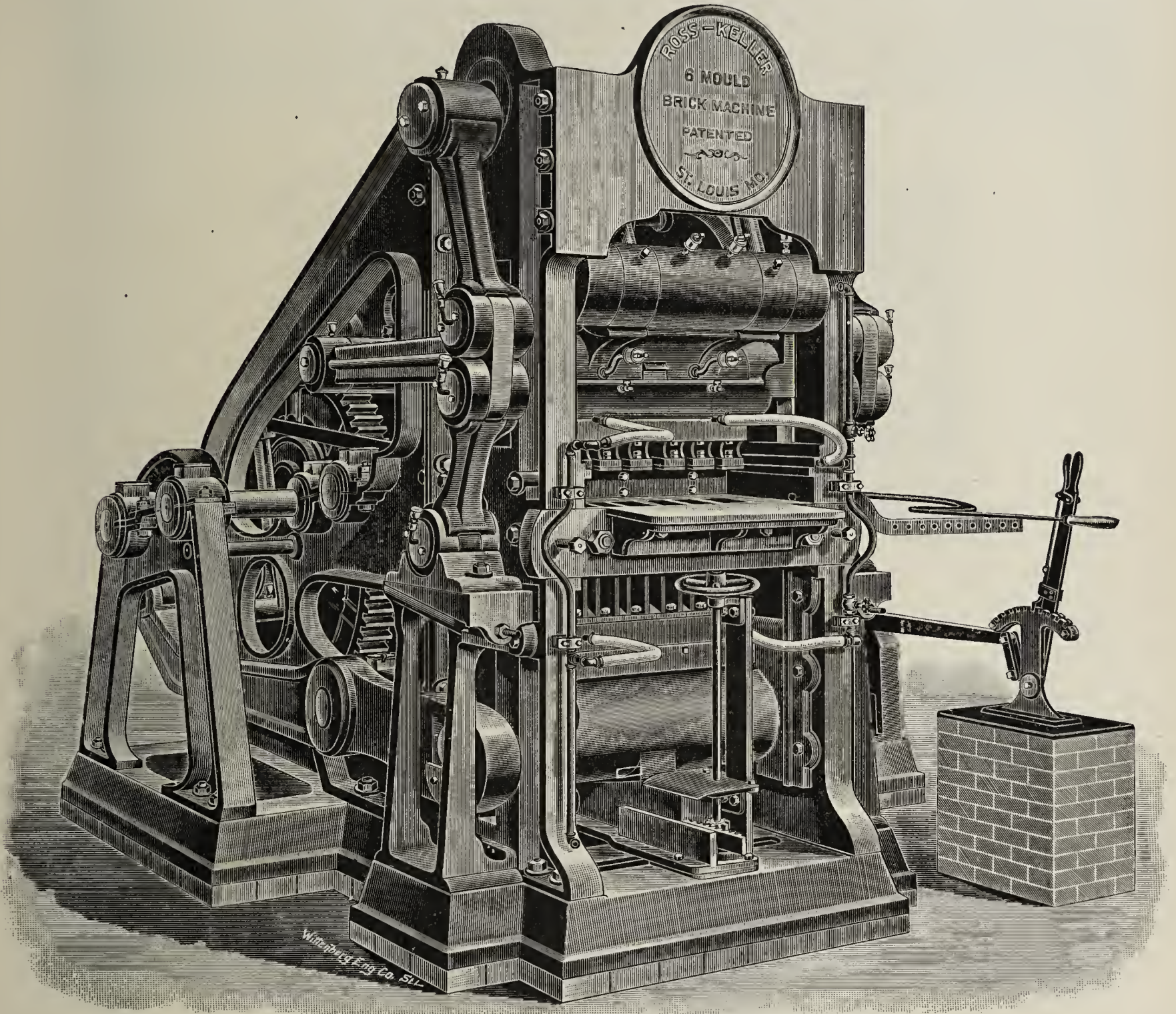
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



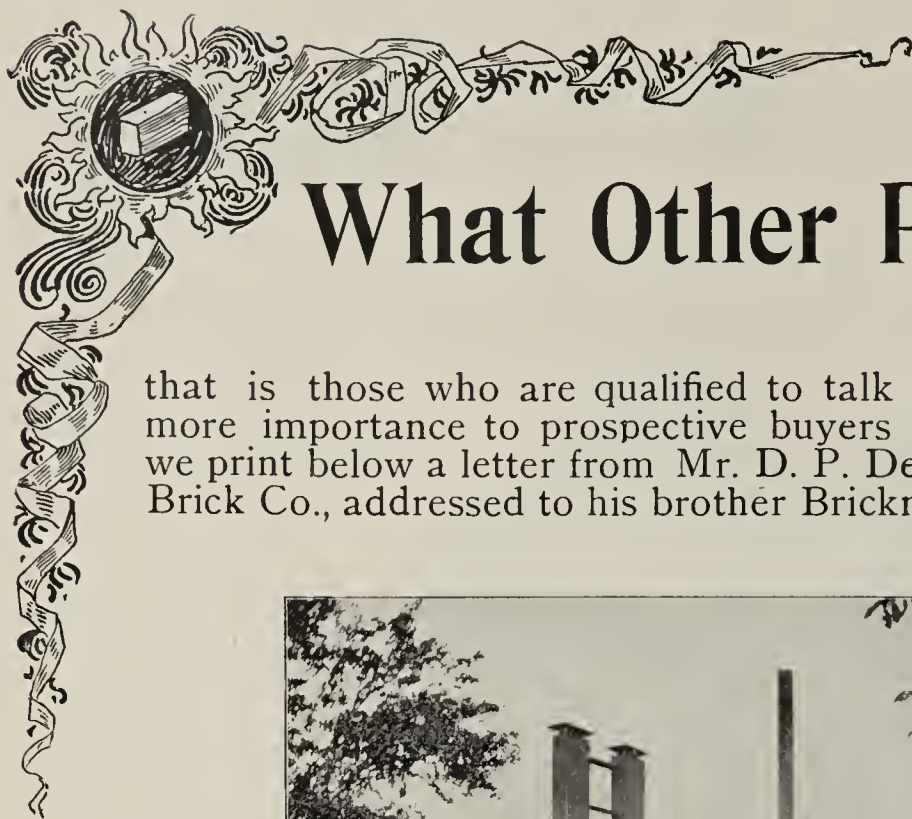
The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,

820 Commercial Building,

—ST. LOUIS, MO., U. S. A.



What Other People Say

About our DRIER, that is those who are qualified to talk about it intelligently, is probably of more importance to prospective buyers than what we say ourselves. Hence we print below a letter from Mr. D. P. DeLong, Proprietor of the Glens Falls Brick Co., addressed to his brother Brickmakers under date of July 10, 1897.



Glens Falls Brick Co's Plant, Glens Falls, N. Y.

"Having made brick for nine years on an open yard, and for the past three years having studied the question of drying pretty thoroughly, I opened a correspondence with The Standard Dry Kiln Co., of Indianapolis, Ind., which resulted in my placing an order with them last October for one of their eight track Patent Natural Draft Driers to be in readiness for drying brick May 1st.

They sent one of their men to superintend its construction; he having charge of setting of boiler (as my power for making brick is water) and all other work in connection with Drier; after putting in about five miles of piping and making all connections and getting steam into Drier, there was absolutely not a leak anywhere. What stronger endorsement of workmanship and material used could be given than the above.

Now as to the Drier, it was put in under a guarantee to dry 30 M soft mud brick per day and it has been drying my brick perfectly satisfactory for two months and I see no reason why it will not continue to do so indefinitely.

As for the "Standard" people I can only add that my business relations with them have been of the pleasantest from first to last.

Brother Brickmakers of the N. B. M. A. (or otherwise) if any of you contemplate putting in a Drier, do not fail to correspond with this company."

(Signed) D. P. DeLONG, Prop.,
Glens Falls Brick Co.

The Standard is the Drier that does not disappoint. It invariably does all and a little more than is claimed for it. It pleases in every instance.

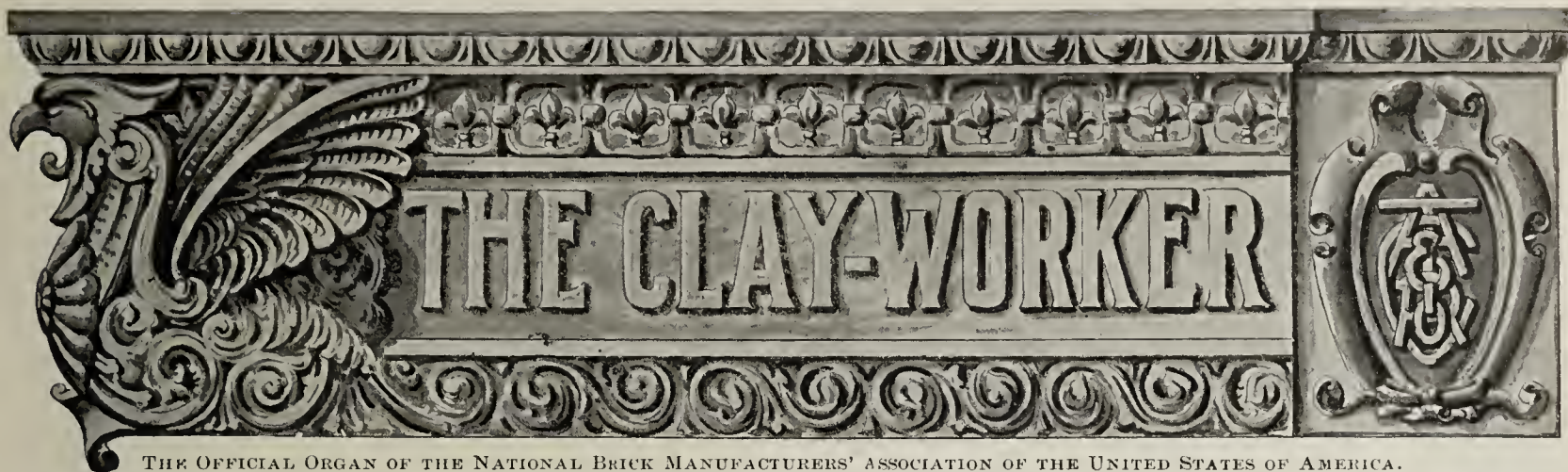
Let us send you our catalog and make you an estimate. This much won't cost you anything.

....

The Standard Dry Kiln Co.,

186 South Meridian St., INDIANAPOLIS, IND.





VOL. XXVIII.

INDIANAPOLIS, IND., NOVEMBER, 1897.

No. 5.

Written for the CLAY-WORKER

AMERICAN ARCHITECTURE IN CLAY.

Decatur's Great Commercial Structure.

THOUGH OUR ARCHITECTURAL contemporaries have had much to say of late years about an American style of architecture, whether we really have an "American style" is still a mooted question. The modern sky-scraper has certainly reached its greatest development in this country. The subject of this sketch, the Millikin Building of Decatur, Ill., affords an excellent illustration of the advancement in this line. That such a building should be erected outside of a great metropolitan city is little short of a marvel. Probably no city in the old world ten times the size of Decatur can show anything in the way of a commercial structure to compare with it. Whatever may be said of the "style of architecture," the enterprise which builds such structures is certainly American. Undoubtedly it is this spirit of enterprise which has made Decatur such a thrifty city. Such things are catching, and extend from one line of industry to another, and the result is an industrious, prosperous community.

The Millikin Building is a fine example of a modern fire-proof commercial structure, the chief elements of which are brick and terra cotta. Hence it is a lasting monument to the skill of the clay-worker and the endur-

ing and artistic qualities of his product. Those of our readers who attend the next convention of the Illinois Clayworkers' Association, to be held in Decatur, Wednesday and Thursday, January 5 and 6, 1898, will find more inspiration in this structure than in the more pretentious sky-scrappers of our metropolitan cities, where such buildings are now too common to arouse interest. Then, too, many of these sky-scrappers are commonplace in character. It is much easier to make a building expensive than it is to give it artistic interest. We have reached that point in connection with commercial structures where the artist and the builder must join hands. In order

that a structure may pay well commercially it must appear well. To those who are interested in the artistic development of this country this fact is encouraging, and all such are disposed to commend the enterprise of a structure such as we illustrate. It is pleasing to see that we have not only the convenient structure, the one substantially built, but also one with artistic value. The effect upon the community cannot but be beneficial. A city does not begin to have clean streets until it begins to have good buildings. Civic pride is at the bottom of all these things. It develops better sanitation, improving public health, stimulating ambition, and in the end comfortable and economical living.

The photograph would indicate that the sidewalk and the street and surroundings of this building are clean. Wealth and enterprise develop these conditions. A



MILLIKIN BUILDING, DECATUR, ILL.

man walking by this building with scraps of paper in his hand would be less liable to drop them on the sidewalk or in the street than in front of the old structure which it replaced. There is probably less tobacco spittle on the sidewalk in front of this structure and on the floors in the interior than in those less attractive. The ramifications of good buildings are wide indeed.

Written for the CLAY-WORKER.

BRICK AS THEY ARE MANUFACTURED IN DURHAM AND NORTHUMBERLAND, ENGLAND.



THE CLAY IS generally taken to the dry pan in dump cars by men, except when too heavy, when a horse is hitched to them. I have seen fire clay as it is elevated from the mine, dumped down a chute direct to the dry pan, steamed and a shovel full of clay thrown from the pug mill onto the dry pan occasionally, which greatly improves the clay, but the tendency is to clog up the perforations. The material is elevated in the usual way to the third floor, passed through a revolving screen about eight feet long, having two pieces of flat iron just long enough to reach to the center of the screen from the side, so that as the screen revolves the iron plates work automatically, keeping it thoroughly clean and getting the full capacity at all times.

As the material falls from the screen it is discharged into a funnel shaped bin, through a chute to the pug mill on the second floor. The pug mill is a cast iron barrel in two sections, so that knives can be replaced very readily. It stands about six feet high, two feet in diameter, has flanges on the top and a pan, which is about four and a half feet in diameter, with a rim fifteen inches high. There are four arms attached to the shaft in the center of the barrel, with four knives suspended on each arm. The material is discharged from the bin right into the pan and a small boy is seated on a stand and attends to the tempering of the clay.

As the shaft revolves in the barrel of course the arms revolve in the pan. The knives having set enough, the clay is

always working to the center into the barrel. The clay is always made a little softer in the pan so that when it comes from the bottom of the mill it will be the right consistency.

There is a slide on the bottom of the pug mill so that the boy can regulate the mill. It is very important to keep the pug mill just full enough so that it does not throw the clay over top of pan. The clay is tempered with warm water, which I think is a good thing, as clay works easier and facilitates the drying. Brick do not check or warp with warm clay in artificial dryers as cold clay would. I think a good deal of trouble could be avoided if more warm water was used; at least this is my experience with brick and small shapes.

When clay is to be worked into large blocks it is put into a corner and allowed to cool, large blocks being dried slower, and if made of warm clay condensation would take place and the clay would get softer and the blocks are liable to sag out of shape.

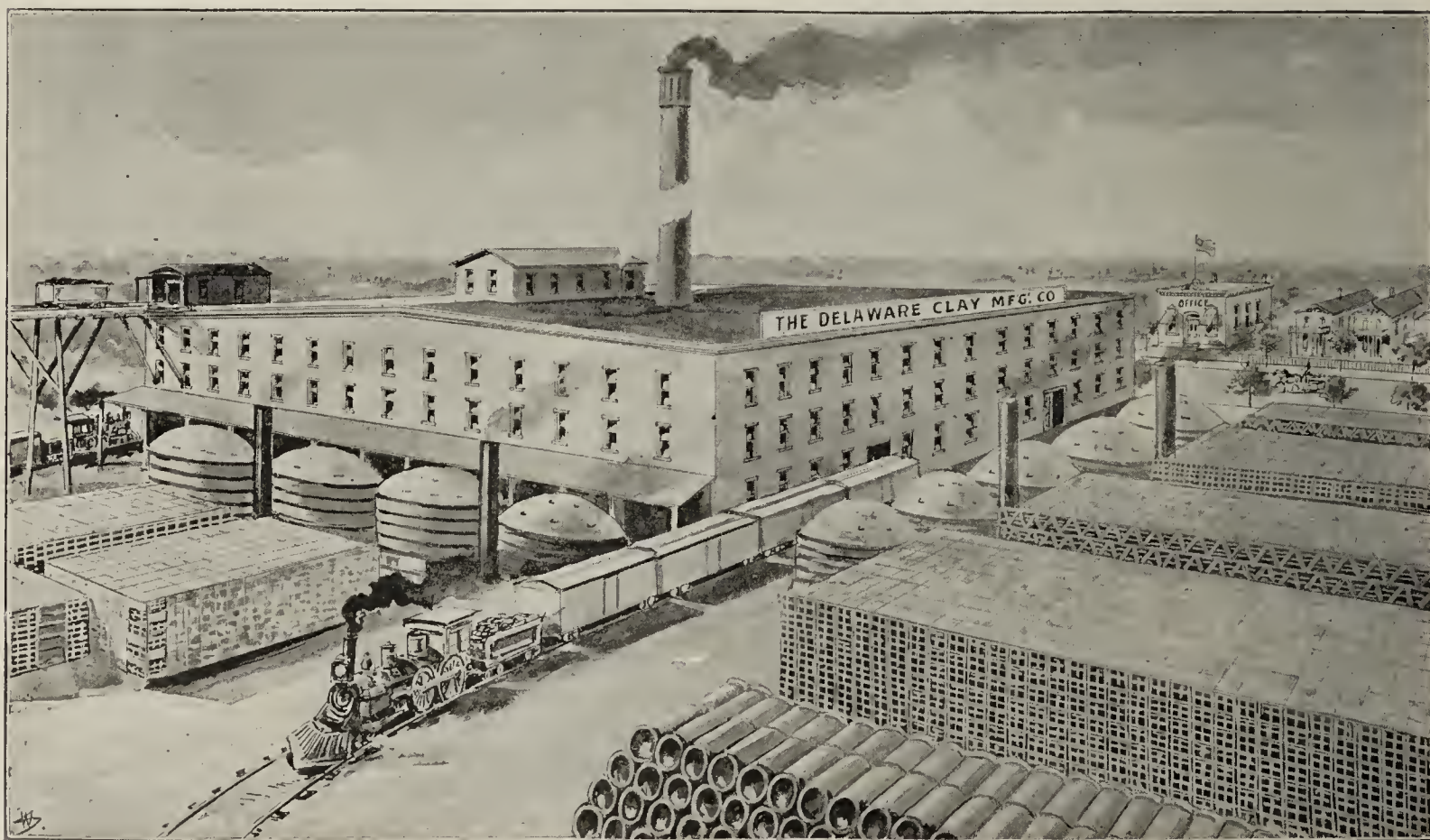
As the clay comes from the pug mill it descends to the first floor into side dumping cars, through a chute lined with sheet iron with a rope attachment so that when one car is loaded the chute is thrown over to another car.

A mill of this description will temper enough clay for 20,000 brick in ten hours, with two men and one boy at clay bank, two men at dry pan, two men and one boy at pug mill. The cars dump the clay direct upon the mounding tables, which are stationed near the car tracks.

The moulding is done in somewhat different manner than it is in this country.

A piece of flannel about twelve inches square is tacked onto the table, on which the ball is made. A piece of wood two inches thick, five wide and ten long, covered with flannel stretched as tight as possible, has the stamp nailed on with a staple at the end, the name plate being in the center of the brick. The mould is made of brass with a flange on the top side of the mould, with no bottom. It weighs about ten pounds. It is made this heavy to prevent it from springing up when the ball is thrown into it. One side of the mould is made a little shorter to allow for a little sagging when the brick is put down on edge.

The mould is put down onto the piece of wood covered with



WORKS OF THE DELAWARE CLAY MANUFACTURING CO., Delaware, Ohio.

flannel, then the ball is made and thrown into the mould, the surplus clay is taken off with the hand; then a hardwood streaker is taken to smooth the brick off. The streaker is then thrown into a box filled with water in front of the moulder, which is called the streak kit. The mould is then emptied upon a pallet, which is taken away by boys. Each moulder has two boys or girls. He must be careful to have the short side of the mould to the left hand so that when the boy takes the brick up to put it on the floor the short side will be on the bottom.

Circular and cupola brick are made in the same way, except that they are taken away in the moulds and put out on the flat. Tiles weighing as much as twenty-five pounds are made in the same way. The moulds for circular and special brick are made of wood, lined with plate zinc. In some places all the brick weighing over twelve pounds are made by the ton, paying from eleven to thirteen pence per ton. A moulder can earn from 6 to 7 shillings per day, getting two shillings per thousand for brick. A moulder can make from 2,500 to 3,600 brick in nine hours.

PICKWICK.

SOME NEW IMPROVEMENTS AND WARES.

NEW PROCESS for the manufacture of ceramle products, patented in France by Riessner, Stellmacher and Kessel. Reported in *Moniteur de la Ceramique*, Oct. 15.

This new process of making ceramie wares consists in firing, in one burning, the rough ware in hermetically sealed seggars, the interiors of which are covered with a substance prepared in a special manner. This coating consists essentially of 600 parts, by weight, of minium, 200 parts of Hohenboka sand, 100 parts of crystallized borax, 20 parts of porcelain clay and 50 parts of feldspar.



J. F. DENISSON.

The ingredients are simply mixed together, and water is added sufficient to form a thick, firm paste, with which the interior of the seggar is plastered. The original feature of the process is that no fluxing material nor phosphate is added to the material being worked, the seggar covering specified above not being added to the material, but, on the contrary, is applied like plaster to the interior of the seggar itself, which is hermetically sealed. Thus the shrinkage of the ware in volume is not very great during the firing, the manufacture is simpler and less costly and the quality of the ware is superior. Without any other manipulation the products obtained are uniform and very smooth, combining the beauty of Parian with the strength of falence.

Written for the CLAY-WORKER.

A SIDE LINE.

The Manufacture of Fire Proofing.



WITH A LARGE NUMBER of manufacturers of drain tile and sewer pipe it has been necessary for them to shut down during certain periods of the year for the lack of orders. This necessitated the idleness of a large number of laborers and also the idleness of machinery, and lastly, but by no means the least, idleness of capital invested, which was not bringing in any profits on account of the shut down. This was and is disastrous to manufacturers in any line of business. There are two firms in Ohio who saw this loss staring them in the face and set about it to utilize what I will call "waste time." The one I will mention in this paper and which I will attempt to describe is the plant of the "Delaware Clay Manufacturing



L. L. DENISSON.



W. C. DENISSON.

Company," of Delaware, Ohio, a stock company managed by the Denisson Brothers.

The plant now operated under the above name has been one of Delaware's leading industries for a number of years. The proprietors, Messrs. L. L., W. C. and J. F. Denisson, have been in the clay business

for the past twenty-five years. They originally manufactured drain tile exclusively. They added a line of sewer pipe to their output after they moved into their new building. Four years ago they added to their tile and sewer pipe lines a complete set of dies for the manufacture of "fire-proofing." It is in the manufacture of this class of clay ware that they have had their most remarkable success and have made the most advance.

In the manufacture of drain tile, sewer pipe or fire-proofing they handle their clay the same till it reaches the wet pans. At present they are mining the largest part of their clay and using it exclusively in making fire-proofing. The clay they are mining is known to geologists as the "Erie Shale." The vein is about twelve feet thick and quite hard. The accompanying cut will give the readers a good idea of one of the rooms of the mine. The shale is fine grained and of good plasticity and is very easily worked in the press. It may be of some interest to those engaged in the industry in Ohio to know that this is the only firm in Ohio using this same kind of clay. The supply at this place is practically inexhaustible.

Their plant is located near the tracks of the Columbus division of the Big Four Railroad, in the eastern part of the city. To get their clay to the factory it is necessary for them to

cross the tracks on a high trestle that rises to the height of the roof of the factory proper. The car which carries the clay from the mine to the dump shed holds a little over a ton of clay. Before the car enters the shed it is stopped on a scale



LOAD TEST.

and weighed and the weight recorded. The amount of clay brought from the mine to the works in a week determines the wages of the employees for that week, they being paid so much per ton. The clay is dumped into troughs, which let it slide to the storage bins in the basement. These bins hold about one hundred tons apiece. Close by these bins sets the main dry pan, which grinds nothing but the clay as it comes from the mine. Just back of the dry pan already mentioned, of which a part is seen in the accompanying cut, is another dry pan. This pan is used to grind the tailings only. The ground clay is elevated to the screens by means of an endless chain bucket elevator. Dry pans, elevators and screens are in pairs, so that the breaking down of one set does not necessitate the shutting down of the entire factory.

The screens are the rotary type and are shown to very good advantage in the accompanying illustration. They have steel frames for the cylinder part and are covered with open-mesh steel wire screening. The method of cleaning is very clearly shown in the cut, and while it is very simple it is also very effective, as well as economical, doing away with anyone to look after it except to keep the bearings oiled and put in new screening when needed. I have already spoken of the disposition of the tailings, and we will now take a look at the wet pans and follow the clay till it reaches the trucks in the form of fire-proofing.

The screened clay from both screens is collected in one large bin. This bin terminates in a chute with a double trap door at its bottom. These doors throw the clay into either one pan or the other at the will of the mixer. In the mixing of the clay for fire-proofing large quantities of sawdust are used for some of the larger pieces, which require the most strength and at the same time must be as light as possible. When making this kind of ware the clay and water are first run into the pan and then enough sawdust is screened and

shoveled in till sawdust and clay are of the proper proportions to give the required strength and porosity. After the clay has been properly tempered it is dumped into the belt elevator and elevated to the hopper of the feeding machine on the second floor. This machine consists of a long box, the bottom of which is a slow-moving slat arrangement fastened to an endless chain and is thrown in or out of gear at the will of the operator. From these slow-moving slats the clay falls onto a rapidly moving belt, which shoots it into the cylinder of the press.

The press is a down-issue steam press of the Barber make. It presses the pieces into shapes and gives them a good, even structure. Great care is taken to have the cores of the dies in proper position, and by having them in proper position the walls of the pieces come out in even thicknesses, dry evenly and burn evenly. This is the secret of success in making fire-proofing, and the manager, Mr. L. L. Denisson, realized it when they first started out in this branch. The table and plunger of this press are both operated by the same man, with two men to off-bear. The two off-bearers take the pieces from the table and place them on the truck. The illustration shows the two off-bearers and the press operator. Directly back of the press can be seen the elevators, one for drain tile and the other for fire-proofing. The truck to the left on the picture is filled and wheeled onto the platform and either hoisted to the second or third floors or lowered to the basement, as may be desired.

The drying system of this factory is unique and at the same time economical. The waste heat from their cooling kilns is allowed to escape into the kiln room and is conveyed to the dry floors through large holes in the wall. The cut of the factory here represented was made some time ago and shows only the kilns outside. There are four kilns located under cover at the present time, and it is from these kilns that the heat for drying the ware is obtained. The three floors and basement have a total drying area of 55,000 square feet.

The ware when set in the kilns is fired slowly the first eight hours. Fire is raised after that time very gradually for the



FIRE TEST.

next twelve, and the last sixteen or eighteen hours the fire is raised as rapidly as necessary to burn the ware properly. The

chemical analysis of the clay made by the writer, when compared with that of the clay chemist at the O. S. U., in Columbus, and also compared with the analysis of Hocking Valley clays, used in the manufacture of sewer pipe, fire-proofing, etc.,



A DISPLAY OF HOLLOW BLOCKS.

leaves the opinion that there is no reason, chemically, why this clay will not make a high grade of fire-proofing.

—Testing the Strength of Hollow Blocks.—

As an example of the strength of the fire-proofing made by this firm, I will quote a test made by the firm for the benefit of the trustees of the Ohio Wesleyan University, represented by Dr. J. M. Barker, financial agent of the O. W. U. and superintendent of construction of all their new buildings, A. Bentley, a contractor of fire-proof structures, of Toledo, Ohio, and E. M. Heller, supervisor of the new Slocum Library, which has just been completed. The material used in the test was what is known as the "flat-arch block." Load and fire tests were both made. In the loading test a 10-inch end constructed, porous, flat arch, weighing but 30 pounds to the square foot, was used, the span between beams being 6 feet, 4 inches. This arch was given an equally distributed load of 1,000 pounds per square foot without objectionable inflection. This weight, large as it may seem, is equal to about fifteen times the weight per square foot on the floor of a room filled with standing men. The cut shows the arch as it was when the test was made and the photograph taken. The method of end construction of these arches can also be clearly seen.

For the fire test a furnace was constructed 10 feet long, 6 feet wide and 5 feet high, making the walls of brick and lined with 3-inch hollow tile or furring. "I" beams were placed on the end walls and one across the furnace at the center and midway between the other two, making two spans, each 5 feet 4 inches from center to center of beams. Sufficient tie rods were used to hold the beams from spreading. Between the beams were constructed tile arches of the same size, weight and material as was used in the loading test. The lower flange of the center beam was covered with a "soffit" tile. The interior of the furnace was covered with one coat of clay plaster and the proper openings were left for fire-places and draft. A stack was built at one end in order to create a draft. The entire arch was next loaded with an equally distributed load of 300 pounds to the square foot. The furnace was allowed to stand till everything was perfectly dry and the mortar well

set, after which it was filled with dry wood and fired until a very quick and intense heat had been obtained. The wood was saturated with coal oil and made a very intense heat. This heat was maintained for a period of an hour and a half, when a full stream of water from a 3-inch hose was turned on from the city water mains. The nozzle was turned into the furnace and the fire was immediately put out, and at the same time the walls and top of the furnace were thoroughly drenched and cooled. The result of this severe treatment was highly satisfactory, as there was no serious nor objectionable deflection of the arches and the covering of the beams remained in place and prevented the iron from becoming too hot—hot enough for it to lose any of its shape. The accompanying cut shows the arch as it stood after the test had been made and as it stood for a month or so afterwards, when it was torn down to make room for the ware that was burned and had to be stored in the yard for a short time. It is to the proprietors of the Delaware Clay Works that I am indebted for the data here given. I had the pleasure of seeing the last arch that was tested, but was not present at the time the test was made. Not a piece of the arch material was cracked nor checked so as to be called serious, which is due to the fact of its porosity, which allows it to expand and contract suddenly without going to pieces.

I have endeavored to give the readers of the Clay-Worker some idea of this factory and also of its product. I have dwelt at length on the fire-proofing, but I don't want to leave the impression that that is all they make. Their drain tile business is quite extensive. They have furnished large-sized tile for some of the largest and longest ditches in the central part of the State. My article is headed "A Side Line," and consequently I devoted the most time to their side line, which is fire-proofing.

WAVERLY.

BUT IT PAYS.

Our distinguished friend, Adsmith Charles Austin Bates, the most successful of all advertising experts, practices what he preaches, which of itself is a mark of credit. He is now running two full pages of preferred space in Printer's Ink, for



PRESSING THE BLOCKS.

which he pays \$300 an issue. So far, he says, the investment has paid well. He summarizes his experience as follows:

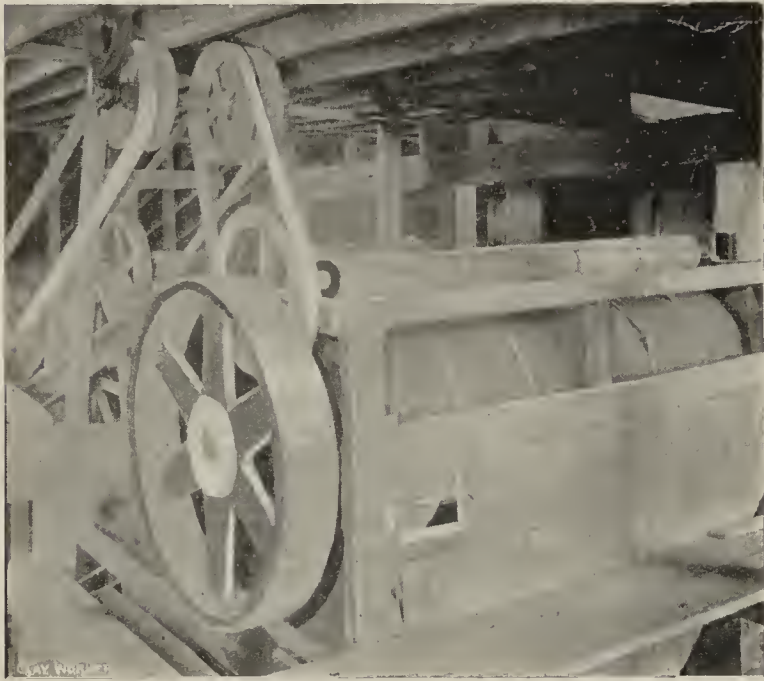
"I have always found that large advertisements were much more likely to pay than small ones.

"My experience has been that whenever I have paid enough

money to tell my whole story in a convincingly truthful way it has always brought profitable returns.

"Large ads. pay me—not because they are large, but because they tell my story.

"This much, I believe, is true of every needed business. To



THE CLAY SCREEN. See page 347.

get trade for it it is only necessary to tell fully and exactly what it is—to take enough space and use it in the right way.

"It takes a certain amount of nerve to use large spaces in high-priced papers, but it pays."

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK.—Third Paper.

—The Causes of Efflorescence.—



BEFORE PROCEEDING to make practical application of the points considered in the two preceding papers, we must examine a few more pertinent topics which have an important bearing upon the front-brick industry. One of them, efflorescence, we have already discussed to some extent under

the head of sulphuric acid in clay. But as the subject of the causes of efflorescence has such a vital bearing upon the front-brick question, it deserves a fuller treatment. And if we cannot find an all-around remedy for this universal trouble, we can at least trace the discolorations to their sources, and in many cases we may be able to prevent it entirely. In speaking of efflorescence we must confine ourselves to discolorations caused by mineral matter in distinction from organic discoloration, which latter is simply the growth of organic matter in the pores of the brick.

Efflorescence, as we know it, appears in several distinct forms; it may be a layer of loose white matter on the surface of the brick, or it may be a coating which has firmly united with the brick. These and other distinctions must serve us as guides in finding the true origin of whitewash. The main help in determining the character of scum is always chemical examination. Now, the origin of scum can be traced to three sources: it may come from the brick, it may be derived from the mortar, and it may originate from the ground. Often this is a hard question to decide—one which cannot be solved without careful chemical investigation. There are cases where the trouble is attributed to the brick, while really the mortar is at fault. For instance, whitewash showing on the edges of brick in a newly built wall is more than likely coming from the mortar.

The brick manufacturer must naturally show the greater interest in efflorescence caused by brick, and this is what we

shall investigate first, leaving the other origins for later discussion.

All efflorescence is due to the presence of soluble salts. Very soluble salts form a loose layer, which is easily removed from the surface of the brick, and which, as a rule, disappears after each rain. More insoluble salts are comparatively permanent. Chemically, we should expect to find in a newly burnt brick, which has not been exposed to the action of acids and bases after burning, only such acids combined with the bases of the clay which have withstood the heat of the burning. For this reason we cannot expect to find organic nor easily decomposed mineral acids, but the list is narrowed down to sulphuric, phosphoric, vanadic and perhaps hydrochloric acid. All the bases of the clay form compounds with these negative elements, but the more soluble ingredients, the alkalis and alkaline earths, lime and magnesia, are represented the strongest. This is the array of substances which may make up efflorescence.

Analysis shows that phosphoric acid is only an accidental ingredient of clay, and if it occurs it does so in exceedingly small quantities, so that it cannot be considered as entering into the composition of clay. Hydrochloric acid is comparatively easily decomposed, so that we may expect to find it only in the interior of soft-burnt brick. Practically, we are restricted to assume the presence of sulphuric and vanadic acid, found as sulphates and vanadates of soda, potash, lime, magnesia, alumina and iron. And this is what we find to be the actual composition of whitewash. We quote two typical analyses of scum found on brick, No. 1 being a white efflorescence appearing on red brick, according to Feichtinger, No. 2 a green scum on a buff front brick, according to Seger.

1. Soda (sulphate).....41.12 per cent.
Potash (sulphate)......84 per cent.
Magnesia (sulphate).....Trace.
Lime (sulphate).....1.02 per cent.
Sulphuric acid (total).....51.98 per cent.
Carbonic acid.....Trace.
ChlorineTrace.
Insoluble matter.....4.88 per cent.
2. Vanadate of potash.....44.38 per cent.
Sulphate of potash.....9.01 per cent.
Sulphate of lime.....7.97 per cent.
Sulphate of magnesia.....10.02 per cent.
Molybdate of soda.....1.62 per cent.
Chloride of soda.....4.47 per cent.
Soluble silicates.....3.82 per cent.
Water18.25 per cent.
Insoluble matter......46 per cent.

The sulphuric acid is the leading element of our enemy,



A "ROOM" IN THE CLAY MINE. See page 347.

whitewash. Its presence determines whether or not a brick will show efflorescence, and by removing it from the clay or

tying it down to an insoluble compound, the chance for the formation of whitewash is eliminated.

Now, how does sulphuric acid get into the clay? To this we may answer that, first, the clay may contain sulphuric acid in the form of a fully developed sulphate, like sulphate of lime, gypsum, as a regular ingredient; second, that it may contain a sulphur compound, which is transformed into a sulphate during the first stages of the burning process, iron pyrites being an example of this kind; third, that soluble sulphates may be added through the water used for tempering the clay; fourth, that clays which naturally do not contain any sulphate may absorb sulphuric acid from the fire gases of the dryer or kiln. The first case is the simplest one; the completed sulphate will remain in the clay during all the stages the latter may undergo, usually even through the burning, unless the material is washed. In this case the soluble sulphates are dissolved in water and carried away by it. No other process will eliminate the obnoxious compound from the green clay, and for this reason it should find a more extended application for the better grades of ware. If insoluble sulphur compounds like pyrites are present, they may be removed by washing with comparatively little trouble. The pyrites, owing to their high specific gravity, are readily separated from the clay slip. Sulphides in clay, unless the burning is conducted with regard to this point or the kiln temperature is very high, will be almost certain to change to sulphates.

As to sulphates introduced by the tempering water, it is remarkable that so little attention is paid to this point by front-brick manufacturers. Wherever one has the choice of water he should carefully investigate the amount of soluble matter carried by each supply. The writer knows of a case where the water supplied for the clay is rank with sulphuric acid, the latter being derived from the oxidized sulphur compounds of a coal mine.

—Effect of Drying and Burning in Regard to Efflorescence.—

In the fourth case we assumed a clay free from sulphates, but which becomes contaminated with them in drying and burning. All fossil fuel contains sulphur compounds. The gases of a coal fire, on striking the damp surfaces of brick, condense their sulphurous vapors, which are then changed into sulphuric acid, analogous to the process by which the acid is manufactured on a large scale. The sulphuric anhydride combines with the free bases, and we have the foundation laid for the production of efflorescence. This is exactly what takes place if the brick are dried in direct contact with the fire gases and during the watersmoking period of burning. Where the fuel is wood, no sulphuric acid is evolved, no fixed compound is formed, and the bases are at liberty to become insoluble silicates as soon as the kiln temperature is high enough, so that we have no whitewash. How powerful the hold of sulphuric acid upon the basic elements is has been illustrated in the last paper by showing that the red discolorations on calcareous clays are due to the formation of sulphate of lime. Unless the kiln temperature is high enough to enable the silicic acid to drive out the sulphuric anhydride, and unless powerful reducing periods occur during the burning, the salts remain in the grasp of this acid, and efflorescence will occur sooner or later. No matter how free from sulphates a clay may be previous to burning, if it is burned in an oxidizing atmosphere with fossil fuel, a portion of the soluble bases will be converted into sulphates. But, as has been shown in the discussion of the burning of calcareous clays, sulphuric anhydride may be removed to a large extent by producing reducing conditions during the burning. These reducing periods should occur during the later stages of the firing, should be made as intense as possible without injuring the color of the brick, and should be produced about two or three times during the burn. They need not exceed one hour at a time, but must be followed by a considerable period of oxidation in order to reoxidize the iron of the clay. Strictly oxidizing conditions must prevail at the end of the burn, unless, of course, dark colors are wanted.

Whitewash having its origin in the brick may appear as a hard coating, united with the surface so that it cannot be removed, or it may be a layer of loose matter. These two kinds of scum are identical chemically, but have been brought to the surface in different ways. The first kind is due to a layer of salts, sulphates or other compounds, formed previous to the burning, that is, either in the drying or watersmoking. This coating on the green brick, if not already composed of sulphates, was changed to such in the burning, and has firmly baked on to the brick. In the second kind of whitewash the soluble sulphates were distributed through the body of the brick and were brought to the surface by moisture penetrating the burnt brick.

The conditions producing the first kind of scum must have been defective, from the brickmaker's standpoint; that is, either the drying was conducted too slow or too rapidly, or the watersmoking was hurried too much. That the latter treatment produces scum is a well-known fact, and on seeing whitewashed brick coming from a kiln, brick men are heard to remark that such a kiln was watersmoked too fast. And often they are right in their assumption. Let us look into this more closely, and let us follow the brick through the drying process. In the manufacture of plastic brick the clay is charged with



THE GRINDING PAN. See page 347.

moisture and undergoes a more or less thorough tempering. The water added to the clay dissolves out soluble matter, and the more the clay is worked and the higher the temperature of the water, the more of the salts enter into solution. The brick made from this clay are now taken to the dryer. All the water in the brick flows towards the surface, where it evaporates. The salts held in solution by the water are, of course, left behind, and form a crust on the surface—a coating which, if not always visible to the naked eye, is always there. Of course, the amount of matter thus carried out is determined by the quantity of salts present, by the water-contents and the degree of thoroughness with which the clay has been worked. But, leaving aside the question of the quantity of water and salts and the thoroughness of preparation, which are variable considerations, the amount of the salts brought to the surface of the brick is determined, first, by the structure of the clay, whether open with large pores, or close with very fine capillary tubes; second, by the rate of evaporation. In the coarser clay the water has a free passage to the surface, and it has opportunities for dissolving salts quite freely. The longer the time of drying is extended, the more of the soluble matter is dissolved and carried to the surface. On the other hand, clays

with dense structure, usually very plastic clays, produce different conditions. Owing to the tortuous paths, to the fine capillary tubes through which the water has to travel, the progress of the latter is slow, and its carrying capacity is much reduced. The fine tubes hold back the dissolved matter, so that the water arriving at the surface is purer than it was when it started on its journey. But if the drying is forced by heat, the flow of water is accelerated, and it is able to carry more salts to the surface, because on its violent exit the restraining action of the capillary tubes is overcome. Therefore, from what has been said, it follows that, in order to reduce the deposition of salts upon the surface to the minimum, it is best to dry coarser grained clays rapidly and denser plastic ones slowly. Of course, the delicate films of salt produced by normal drying do not affect the color of the brick to any extent; it is only abnormal drying which gives the harmful scum. Clays which naturally contain such a high percentage of soluble salts that incrustations are always produced on drying are not fit for the manufacture of front brick.

What has been said of drying may also be applied to water-smoking, with some modification. Though a brick may seem perfectly dry when it leaves the dryer, it still contains mechanical moisture. Now, this water, if expelled too rapidly—that is, if the kiln temperature is raised too quickly—carries to the surface a quantity of salts out of proportion to the amount of water. For it is a well-known fact that hot water will dissolve more of a soluble substance than cold water. It seems rational, therefore, to watersmoke at as low a temperature as possible. The diligent use of a thermometer will pay for itself in the decreased risk of surface incrustations.

—The Porosity of Brick in Relation to Efflorescence.—

In considering the drying process in regard to "whitewashing," the plastic brick seem to be at a disadvantage as compared with dry-pressed brick, because the latter contain much less water to be evaporated. This is true, and if the water-contents were the only condition influencing the production of efflorescence, the plastic brick would have the worst of it. Not that they contain more soluble salts, but that they have a stronger tendency to show surface scum when green. But another point enters into consideration—the porosity of the burnt brick. Plastic brick are denser after burning than dry-pressed brick. In order to render dry-press non-porous, it is necessary to vitrify them, and that, as we know, is not an easy thing to do, while plastic brick may be dense and yet not vitrified. A dry-pressed brick, not vitrified, absorbs water readily, and the sulphates are soon brought into solution and show on the surface. It appears that the question of efflorescence is pretty well balanced between the two processes. Still, a vitrified dry-pressed brick has an advantage over a stiff-mud brick made from the same clay, because, first, it has less water to evaporate, second, because it is non-porous. In general, the tendency to "whitewash" decreases with the degree of burning. Vitrification destroys sulphates, and hence it is the surest "cure" for efflorescence.

In regard to vanadium discolorations, it must be said that comparatively little is known about the element and its combinations. We know that it acts much like sulphuric acid, and that it is destroyed by vitrification, high heat and reducing atmosphere.

The subject of efflorescence being so important a one to the front-brick manufacturers, more attention should be paid to the matter of examining clay in regard to its contents of soluble sulphates. A bed of clay free from sulphur compounds of any kind, and burning a satisfactory color, should have a higher commercial value than one not free from the obnoxious compounds.

—Remedies for "Whitewash."—

Many are the "sure cures" of whitewash, comprising all sorts of ideas, good and bad ones. Dips of all kinds have been prescribed—flour paste, solutions of acetate of lead, silicate of soda, caustic potash, diluted muriatic acid, linseed oil, tar, etc.

Most of these are too troublesome to apply, and the results are doubtful. It seems to the writer that it will be best to consider, first, the means by which sulphuric acid may be removed from the clay; second, the methods by which it may be rendered harmless.

Clay containing sulphates or sulphides is best freed from these impurities by washing, and there is no other process by means of which this can be accomplished so successfully. The disadvantages are the cost and the fact that an ample supply of good water is required.

Where sulphurous water for tempering is in use, its substitution by good water eliminates that much sulphuric acid.

Firing with wood in place of coal removes the chance of sulphuric anhydride being evolved from the fuel. If wood is fired up to red heat and the kiln finished with coal, the chance of "whitewashing" is considerably lessened.

During the burning the sulphuric acid may be expelled by reduction, a process which has been repeatedly mentioned.

As to counteracting or modifying the effects of sulphur, we have several ways open. The drying may be suited to the clay and modified so as to produce the least amount of scum on the surface of the brick. Direct firing of dryers to be replaced by indirect firing.

Addition of barium compounds to the clay, in order to produce insoluble sulphates of barium. In this case the bases bound by the acid are set free, and are converted to insoluble silicates in the burning, while all the acid is taken care of by the barium. The amount to be used of the latter is determined by the quantity of acid present, and is easily calculated from chemical analysis. Enough of the barium must be added to combine with all the acid, and an excess of 50 per cent. over the theoretical amount must be allowed, owing to insufficient mixing, etc. However, it is folly to add less than the required amount, and waste to add more. Frequent chemical examination of the clay will pay in the end. The barium should be added both in the form of the chloride and the carbonate; the former is sold in the liquid state, the latter in the solid. Half of the amount needed should be introduced as the chloride, half as the carbonate. For dry-pressed brick the carbonate alone is used.

Sometimes, under some conditions, one face of front brick may be kept free from efflorescence by giving the green brick a dip of tar. The latter prevents the evaporation of water on the side thus protected, hence no salts are deposited and the danger of whitewash is lessened. In the burning the tar, of course, burns off.

The only means known so far for the prevention of vanadium discolorations are vitrification, high heat and reduction during the burning.

—Efflorescence Derived from Other Sources Than Brick.—

Though brick are usually credited with the production of efflorescence, this is not always true, and every brick manufacturer should make it a business to investigate whether the brick are really to blame, or whether the mortar or other influences have something to do with the discoloration. On new buildings white blotches showing on the brick work are not infrequently due to lime which has been dissolved from the mortar by water. This lime, through the action of carbonic acid in the air, is changed to a carbonate, and will remain as a permanent coating. Muriatic acid will readily remove such discolorations.

The most important source of whitewash, however, is a reaction which takes place between the sulphates contained in the brick and the alkalies of the mortar. The caustic alkalies and the carbonate combine eagerly with the sulphuric acid of the brick, forming crystals of alkaline sulphates which spread over large areas. This has been demonstrated to be the case quite frequently. Other theories have been advanced in reference to other formations of whitewash. It has been claimed that lime and ammonia, with the help of some acid, act upon the alkalies of the brick, causing them to be sep-

arated, similar to the Lawrence Smith alkali determination practiced in analytical chemistry.

Another source of efflorescence is the ground, especially if the latter is rich in nitrates, ammonia and organic compounds. These substances give rise to various discolorations. Much of the so-called "saltpetering" must be attributed to the compounds coming from the ground. According to O. Helm, the nitrates, ammonia, etc., give growth to a kind of bacteria which is very common on walls, especially if a sewer is in close proximity.

Last, but not least, the air has much to do with the appearance of scum on the surface of our walls. It is the carrier of the different acids evolved in our modern cities—carbonic, sulphuric, hydrochloric acids, together with various other compounds, soot, etc., all of which tend to discolor and eventually destroy the walls. Not only are the different scums injurious to the appearance of the building, but they gradually but surely destroy our building material, unless it is the best material known—vitrified brick.

AMERICUS.

(To be continued.)

Written for the CLAY-WORKER.

BUTTON-HOLE TALKS.

I HAD THROWN MYSELF down on the bed, so utterly worn out that I did not undress, and had fallen asleep almost before he turned the key in the door, and so profound was my sleep that it seemed almost a part of the same action on his part when the key rattled again in the lock and my "Button Holer" of the evening before sat me up on the side of the bed, braced me against the bed post, ran his finger through the frayed hole that showed where my button hole had been, gave a satisfied sigh and began:

"Don't catch me taking chances on a thing like this. If I hadn't locked you in last night just like as not some other fellow would have had you now. Getting so it's awfully hard catching a listener, and when a fellow gets all loaded up and ready to talk, just bound to talk, got to talk, must talk, and no listener to be had it's just awful. Saw two or three of these loaded fellows watching for you last night, just waiting to pick you up when I dropped you, and that's the reason I filed you away myself and locked you in and took the key. What! breakfast!! No, never mind, it's early yet and we have plenty of time for a nice long chat before breakfast—called you early on purpose—and the door is locked so those other fellows can't get in. What! 'Can't take much interest in life before breakfast!' Why, man, there's none too much use taking stock in it anyway. One way there is and one way there isn't. One individual don't fill so much space anyway.

"Now, do you remember who it was who said if you want to see how the world will miss you when you are gone, go to a good-sized mill pond—not a little bit of a pond nor a big lake, just a fair-sized pond—take a cambric needle, put the needle down into the water point first, holding onto the eye end, and then pulling straight up withdraw the needle and look into the hole it leaves? This, the man said, would show pretty well the commotion your leaving the world would make. Now, said he, who was it that said this? I answered promptly that I didn't know and he as promptly and as honestly continued, "Neither do I know nor care." We all know that the sun will not stop shining nor the stars twinkling when we drop out. No one is necessary. The very greatest make but a little splash and it's all over and forgotten pitifully quick. Really, though, there is no one so poor or so depraved that his going out does not leave some mark. That somewhere there is not some heart that aches for him, some mind that goes back into the stores of its recollection, and, passing by and avoiding all the sad and bitter recollections, gleans out some good and beautiful memory of him when he is gone, and, forgetting all the bad, cherishes that memory. Then, too, there is not a life that occupies so little, so insignificant a space that it is discouraged in itself, really discouraged. Forgetting the misery

of the past and looking away from the horrors of the present, the human mind constantly looks forward and hopes for better things in the future. The slender thread of life which, with their surroundings, would appear to many as of little worth, is to them a pleasure unparalleled. No, the hole in the mill pond doesn't look big to the casual beholder, but if it is personal and you yourself are the needle you know all about how big the hole is."

GATES.

WEBER'S PATENT PAVING BRICK.

WE ILLUSTRATE a new form of paving brick which the inventor claims is superior in several respects to those now in use, the chief advantages being great strength and simplicity of form that greatly lessens the liability to chip off on the edges, thus making a more durable and satisfactory pavement.

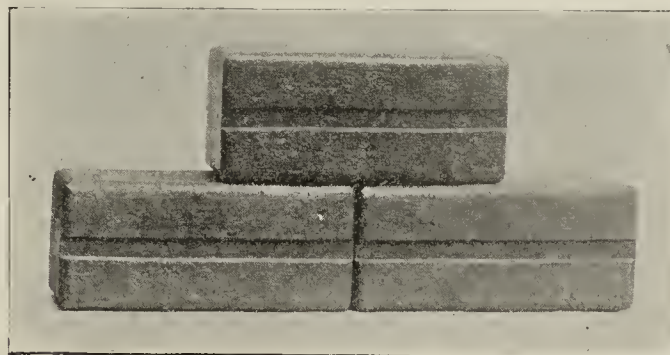
As will be seen by the accompanying illustrations, there is



a vertical groove through the center of the brick, which, together with the curved edges of the brick, makes a passage for the cement, tar or other liquid to be poured over, or between, the brick for the purpose of bonding the pavement, thus insuring a secure foundation for each individual brick and locking the whole mass of brick together solidly.

The corners and edges of the brick are curved or beveled slightly, which not only reduces to a minimum the tendency to chip, but also leaves a space along the under edge of the brick into which the cement runs, thus entirely surrounding the brick by the filling, which, when hardened, forms a secure and equable foundation for the brick to rest upon.

For this reason pavements laid with these brick are less



noisy, more durable and every way better and more satisfactory than those made of ordinary paving blocks.

The peculiar features of this brick are fully covered by letters patent granted to the inventor, Bruno Weber, of Veedersburg, Ind., from whom the right to manufacture in a certain territory can be obtained on reasonable terms.

A CLAY CURBSTONE IN GERMANY.

In Germany a mixture for the manufacture of clay curbstones, gutters, drains, etc., consists of the following: Clay, 91½ parts; iron fillings, 3 parts; common salt, 2 parts; potash, 1½ parts; ash of elder or willow wood, 2 parts. Directions for coloring the mass are: Violet brown color, two parts of pyrolusite to 100 parts of the mass; violet, 1 part of pyrolusite; green, 1 part of copper scales; blue, 1 part of oxide of cobalt; yellow, 2 parts of oxide of antimony.—Exchange.

THE BEST FIRE-PROOF CONSTRUCTION FOR BUILDINGS OCCUPIED FOR MERCANTILE PURPOSES.



NE OF CHICAGO'S most eminent architects, Major W. L. B. Jenney, of the firm of Jenney & Mundie, recently delivered an instructive address on the above subject before the Chicago Fire Underwriters' Association, prefacing his remarks with references to the great fires in Pittsburg and St. Louis which have led many to think that the term "fire-proof" is a misnomer. Such, Major Jenney demonstrates, is not the case, as will be seen by the following extracts from his address:

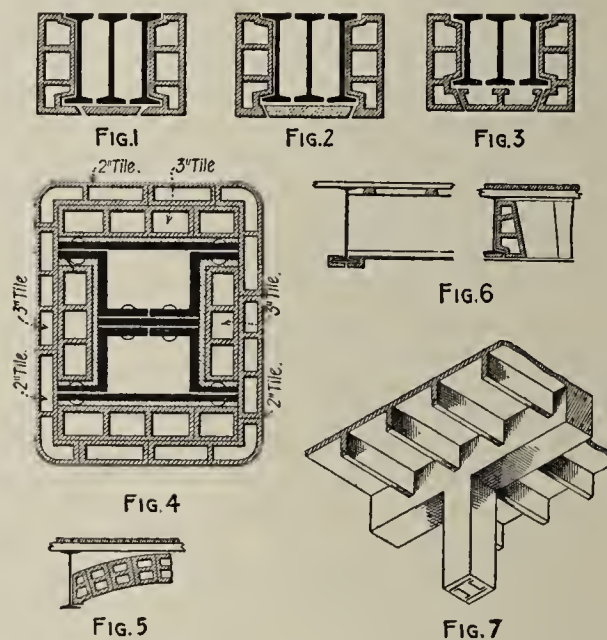
—Fire-Proofing.—

Fire-proofing should be much more substantial than what is at present in general use. The recent fires have demonstrated that it is not difficult to protect the steel from injury. The fire-proofing, as usually constructed, protects the steel, but is itself usually destroyed, causing serious loss. The material should be carefully tested by heating to redness and plunging into water, repeating this test five or six times. If it flies to pieces it is worthless. What is known as soft, porous terra cotta, if the clay is good, usually stands well. This is manufactured by adding six parts of sawdust to four parts of fire clay. On burning, the sawdust is consumed, and furnishes a tile full of air-holes or little cells, rendering it impossible for any hurtful heat to penetrate to the metal. The weakest part in the usual fire-proofing is the protection of the soffits of the beams and girders. As usually constructed, they are like Fig. 1—a long, weak flange on either side holding in a dove-tailed manner the soffit tile. The tile is also too thin and too close to the flanges of the metal beam. This is a serious fault, because the soffit is the very surface which has to resist the intense heat and action of the fire from the burning goods below, and is exposed to the direct force of the water.

In the Clay-Worker of April, 1897, I find in the report of the proceedings of the last convention of the Brick Manufacturers at Buffalo, New York, in a discussion of this subject, Mr. Gates, President of the American Terra Cotta Company, of Chicago, condemns the arrangement of Fig. 1, where the soffit tile only one inch thick is placed close to the flanges of the beams and only supported by the long, weak flanges of the side tile. Mr. James Taylor made a diagram of a method he suggested which would overcome the dangerous method of Fig. 1, so justly condemned by Mr. Gates. He proposes a porous terra cotta flange two inches thick (Fig. 2), supported by short, strong flanges on either side. By this method the whole surface of the metal girder is covered with a non-conducting material which has absolutely no liability to crack or break under the most severe differences of temperature. The short flanges on either side reduce the liability of cracking or breaking to a minimum, and the additional thickness affords additional solidity without much increase of weight, and greater ability to resist the action of heat and water. In Fig. 3 Mr. Gates showed how the terra cotta could be used in a double capacity, as a fire-proofing protection and as an exterior finish when such girders are used projecting from exterior wall, moldings can be added at pleasure. Care must be taken in dimensions and shapes, in order that the side flanges shall securely hold the soffit tile, so that it cannot escape or be knocked out by a stream of water. The floor arches should be very substantial, and what is known as "porous and end construction" is recommended. The laying of the terra cotta is very essential. Common lime mortar should be discarded as unfit for the purpose, and Portland cement mortar should be used, adding only sufficient lime mortar to make it work freely under the trowel. Every joint should be filled with mortar over the entire surface and the tile crowded closely together. In putting in the key, unless it fits closely, slabs of tile covered by cement mor-

tar should be forced into the joints. It is very essential that these tile floors should be very rigid, as by so doing they prevent the lateral movement of the building, not only in case of fire, but as against high winds. If this work is well done, they will take up a material portion of the wind pressure even in a building of moderate dimensions. In most of the fires that have occurred in fire-proof buildings very serious damage has been done to the floor arches by the scaling off of the lower web, necessitating the replacing of the floors at an expense even greater than first cost. Concrete on top of the floor arches should be of good quality. Soft-coal cinders should not be used. Crushed slag of the blast furnace is far better; it is full of air cells, and, being produced at very high temperature, is not affected by any heat likely to obtain. This concrete should not be inferior to that used in sidewalks, and when practicable should form the floor, so as to avoid wood floors. The column protection is another detail that should receive the most careful attention, for the columns are the main supports of all that are above, and if a single one should fail it brings down all there is directly above it, and the loss is necessarily very serious.

At the Fair Building the columns are doubly protected (see Fig. 5), so that should the outer layer of terra cotta be knocked off the column would be sufficiently protected by the second



layer, which would be sufficient to resist the heat and prevent any serious injury to the column. For round columns there can easily be two layers; the inner one should be bound on firmly by wires or wire netting, which, lying close against the terra cotta, is itself protected. That this is the case can easily be shown by tying a piece of sewing cotton tightly around a lead bullet and holding it in the flame of a candle; the lead will melt before the string burns off.

The Chicago city ordinances demand in cases of buildings devoted to the sale, storage or manufacture of merchandise the covering of columns shall be, if of brick, not less than eight inches thick; if of hollow tile, these coverings shall be in two consecutive layers, each not less than two and one-half inches thick; if of porous terra cotta, it shall consist of at least two layers, each not less than two inches thick, each course breaking joints, and to be so anchored and bonded in itself as to form an independent and stable structure. If this is carried out in a proper manner, the protection is all that is necessary.

The recent fires have demonstrated that steel is more easily protected than is usually thought. For example, beams in the condition of Fig. 6—that is, with the lower flange entirely exposed on the ceiling, where it is subjected to the greatest heat in case of fire—these beams have gone through a severe fire without injury, still Mr. H. B. Seely, in his paper on the "Art

of Fire-Proofing," published in the Engineering News of April 9, 1895, theorizes that a beam in this position is liable under heat in case of fire to sag, on account of the lower flange of the beam being heated to a considerable degree more than the balance of the beam, will necessarily expand, and will cause a deflection of the beam to such an extent that the arches might drop out. Mr. Seely is undoubtedly correct in this theory, still I can find no example of such a serious accident in the reports of any of the fires, which is our only practical test; still, as the expense of protecting the lower flange is so small, this omission is not to be recommended.

The limit by law in height of buildings makes it desirable not to take more than is necessary for the thickness of floors, so that the top flange or girders or beams, for convenience, is often left uncovered. To this there is less objection.

The flange of a beam is such a small part of the whole and so far removed from the mass of the steel that no heat that can be produced by the burning of the goods on a floor above will seriously injure the beam. Moreover, the floor is protected by the goods and deluged by the fire department, so that in an ordinary wooden joist building there are records of floors falling from the burning off of the joists and from falling walls, and after the fire was out considerable areas of unburnt floor were found in the basement still covered by partially consumed goods, so that, when convenience demands, it is not very objectionable to adopt the construction shown in Fig. 6.

For partitions the ordinary three or four-inch tile the Pittsburg fire shows to be a disappointment. They do not stand any better than wood studding covered on both sides with wire lathing and plastering. Indeed, it is reported that the firemen stated that the hot tile partitions appeared to dissolve and fly into powder as the water struck them. The appraisers noticed that the amount of debris around partitions where considerable portions had been knocked down was very small.

From these fire tests it is probable that very satisfactory partitions can be made by steel tees or anchors set vertically, secured top and bottom, covered on both sides by the metal lathing and fire-proof plastering (asbestic). Still greater security could be obtained by filling in between lathing with asbestic. A superior partition is made of concrete stiffened by twisted square rods (Ransome system).

The lower six or eight feet of all columns should be protected against damage from shocks by a substantial covering of sheet metal, as boxes of goods are piled up against the columns and they are also subject to be scraped by passing trucks. This outside metal covering will render it impossible for the fire-proofing to be stripped off during a fire. There is a still further protection to the columns that I would strongly recommend, which is the filling of the interior of each column with good Portland cement concrete rammed into place. This will protect the interior against rust, and materially strengthen the column as against bending in case of severe fire. This was done in the first nine stories of the Home Insurance Building in this city.

A particular feature of the Pittsburg fire to be remarked is that no particular part of the fire-proofing seemed to resist the fire better than another; the column tile, the floor arches and the beam-flange covering seemed to have been destroyed about equally. In the office building, where partitions were used, their destruction was pretty serious, as might have been expected. No very great stability against fire and streams of water can be expected from partitions of four-inch tile, and the wonder is that they stood as well as they did. In respect to their efficiency, however, there does not seem to be much choice between partitions of four-inch tile and metal lath and wooden stud partitions used in the Methodist Book Building, and the builder who pins his faith to either to resist a severe attack of fire and water is likely to be disappointed.

The behavior of the sixteen-foot span concrete floor arches in the Methodist Book Building must, we believe, be conceded by every fair-minded man to have been most excellent, and to

justify the faith which many architects and engineers have shown in concrete floor constructions. It is true that the heat to which they were exposed was not as great as that in the building with the tile construction; but it is also true that many of these concrete arches were in the midst of a very severe fire for a considerable time, and came through it, with hardly an exception, absolutely unharmed. We believe that the Pittsburg fire adds convincing evidence to that already accumulated in engineering literature that concrete is entitled to rank as a material of the highest value in fire-proof construction.

Among the systems of concrete floors and fire-proofing, that known as the Ransome has been used quite extensively, especially on the Pacific coast, where there is a borax warehouse which has been tested over large areas with a load of 500 pounds per square foot. The theory on which this construction is based is this: Concrete has a great compressive strength, but very small tensile strength; therefore, it should



W. A. B. Ransome

be used exclusively in compression. To obtain the requisite tensile strength, square iron rods twisted cold are imbedded in the concrete. It is easily seen by inspection that these rods are firmly held in place by the concrete. The square surface twisted forms a hollow which ties the concrete in the direction perpendicular to the rods, and the twist ties it in the direction of the rod. Experiment has taught that narrow webs of concrete, say one inch thick, are ample to resist all the strains in the vicinity of these twisted rods, so that, as in Fig. 7, the bottom of the beam in section shows a width of only three inches for the bottom of the concrete cross-beam, which is found by experience to be amply sufficient; with an untwisted square rod it would be necessary that this should be materially increased, or it would cause a flaking off, causing a complete destruction of the concrete directly above the rod. This work is comparatively light and not expensive, as the steel used is of the cheapest character. Being square rods, the cost of twist-

ing adds to the strength of the rod sufficient to pay for the expense of the twisting, which does not exceed a dollar a ton. This system has another advantage—that it forms the floor above. Nothing is better for a warehouse than a smooth concrete floor. It is easy to truck over, and avoids the combustible material of the usual wooden floor, as in a warehouse it is desirable to avoid the use of any combustible material, as in case of fire it only adds so much to the burnable material and increases the loss.

All the great fires have shown a total destruction of the plaster. None of the plasterings usually in use will stand fire and water. In the Pittsburg fire, as is usually the case, the plastering was entirely destroyed. A new fire-proof plaster has just been put on the market, an invention of General William Sooy Smith, known as asbestic. It is made largely of pure asbestos, which, as is well known, resists perfectly an intense heat. It is manufactured by the H. W. Johns Manufacturing Company, of New York. This plastering is put on in the usual way, and can be finished rough or smooth, the same as the usual plasters. Tests were made in the presence of the officials from the Supervising Architect's office in Washington. A room was built about four feet high, plastered on the inside with asbestic. This was filled with combustible material, which burned furiously for half an hour, when a stream of water through a 1½-inch nozzle was poured on the interior, sides and roof, without any effect. The plaster did not drop

In conclusion, from the lessons learned from the Pittsburg fire, and from all that we know at this date, a building constructed as I have suggested—a steel skeleton construction, with an adequate foundation—the exterior walls of brick, with terra cotta trimmings; the fire-proofing and the floors to be of porous terra cotta that has been thoroughly tested, or with concrete strengthened with square rods twisted; the floors to be of smooth concrete; the interior finish, such as wainscots, baseboards and the casings of windows and doors, to be of concrete; the doors to be of metal (these can be ornamental or plain, as desired,)—in such a building the stock can be entirely consumed with but little injury to the building other than smoking the walls and ceilings and the blistering of the paint.

If the building is protected from external fires by outside shutters, then the windows will be destroyed; but if there is no danger from outside fires, the shutters can be on the inside of the building, and, if closed, will save the windows. Manufacturers of ornamental iron are at present at work endeavoring to produce substantial iron window frames and sash at a price that an owner will be willing to pay. When this is kilns, and when the burning is thought to be finished, these pieces are withdrawn and plunged into water and examined, done, the loss to the building will be little more than the glass, the interior painting and calcimining. The loss on the stock can only be reduced by strictly fire-proof division walls and



[GENERAL VIEW OF THE STONINGTON (MISS.) BRICK CO'S WORKS.]

or crack, but was intact. This is exactly the material that we require for the finishing of our fire-proof buildings, for in case a stock of goods takes fire, all the ordinary plastering is destroyed. The fire-proof qualities of this plastering will undoubtedly tend to the preservation of the fire-proofing. A nail can be driven into it without cracking it, which is often an advantage.

The usual stone vault covers forming the sidewalk are not admissible, as in case of fire they are a total loss. Steel beams with brick arches covered by a concrete surface are for this purpose far superior, and can be expected to go through a fire without material injury.

—Brick and Terra Cotta Best.—

The exterior should be brick, with terra cotta trimmings. Stone, as a rule, will not stand fire and water. Granite is particularly bad, flying to pieces so as to be usually a total loss. Good brick stands well. The trimmings and ornamental parts can be of terra cotta, which is a brick as far as material is concerned. Terra cotta can be had that will stand severe quench tests. In burning the terra cotta, test pieces are put in the which is itself a test.

by shutters to all outside openings. Where there is danger from other buildings, by shutters shutting off the light shafts and stairways from each of the stories.

What I have proposed will add but a small percentage to the cost of the usual fire-proof buildings. It simply requires increased knowledge and greater care and thought on the part of the architects, and most careful superintendence of the construction.

OVERWORK AS BAD AS IDLENESS.

Standing in a grist mill recently I saw a loose, short belt free on the shaft, idly and aimlessly being pulled round and round, now fast, now slow, and occasionally stopping altogether, says L. A. Ely in the *Detroit Herald of Commerce*. "This belt," I said to the miller, "will probably last forever, as it has nothing to do save hang on and be carried by the shaft." "In this you are wrong," the man replied. "That belt is wearing out more rapidly than it would were it doing its full duty,

as the friction within is much more than when strained to its limit of endurance, and the wear is severer than when the belt is working."

Just then we were startled by a dull thud on the floor beside us, caused by a broken belt falling there. I told the miller I thought this scarcely verified his former statement, as this belt was broken while actively engaged at work. "Well," he said, "there is a limit, beyond which man and machinery can not go. In this instance we tried to have the 2-inch belt do the work on a 9-inch pulley that called for four times the strength represented in this small belt. It could not stand the strain and so it broke. The fault was ours in asking so much." Just at this point the small belt was caught by the pulley and torn into dozens of strips. "Ah," said the man, "that comes from the belt having nothing to do. It was opposed to a superior force and had to yield."

These illustrations of the wearing-out power of idleness and the destructiveness of working beyond natural strength forced themselves upon my mind as fit emblems of man. I pondered long over them and concluded there was a limit, beyond which man might not with safety go, either to the extreme of overwork or its direct opposite, idleness.

GERMAN NOTES.

In order to neutralize the injurious sulphuric acid evolved in burning coal in kilns, a Hungarian has patented a vaporizer which sprays a solution of caustic lime or some other base into the fire space. The sulphuric acid attacks the lime and is thus prevented from acting upon the ware; at the same time water gas is evolved, which helps to produce a more intense heat.

Messrs. Pope & Henneberg have invented a sieving apparatus which is quite ingenious. Ground clay or other pulverized material, falling in a vertical direction, is struck by a blast of air, which is distributed by sheets of wire gauze of varying mesh. Fine particles of material are carried fartherest by the blast of air, coarse ones only a short distance, and thus a complete separation is effected.

The Topfer & Ziegler Zeitung brings an illustrated description of a German brick plant equipped with a Boyd dry-press. This factory, located at Chemnitz and owned by a Mr. Dietzel, has the usual dry-press outfit, consisting of a dry pan, elevator, sieve and bin. The sieve is of the stationary type, 12 feet long, 54 inches wide and inclined at an angle of 45 degrees. The mesh of the sieve is 5-32 inch. The press is a three-brick machine and makes 15,000 large-sized German brick a day. Mr. Dietzel is the German agent for the Boyd press.

The past season has been a busy one for the German brick industry. The demand for brick was lively and the prices were satisfactory. In some districts the demand actually exceeded the supply, and building had to be suspended owing to the lack of brick. This encouraging demand for brick has resulted in the organization of a large number of companies contemplating the erection of brick plants.

Mr. O. Bock, the well-known brickyard engineer, has patented a generator system for burning coal in continuous chamber kilns in which the brick do not come in contact with the fuel. The coal is first "gased" to coke and then the latter is burned. Each chamber has a generator, consisting of a narrow slit-like flue, extending across the entire width of the kiln, like the bag wall in a square down-draft kiln. The bottom of each generator has a number of narrow openings; each of these fire spaces is built along the division wall between each kiln chamber by putting up a hollow bag wall. The coal thrown in from top is heated by the hot division wall and the hollow bag wall, through which passes a current of highly heated air from the last cooling chamber. Thus, the fuel is

first heated indirectly till it is converted into coke, when the hot air is turned into the generator and compelled to flow through the coke, consuming the latter completely.

MAKING BRICK IN MISSISSIPPI.

Publishers Clay-Worker:

ENCLOSED FIND P. O money order for \$2.00 to pay for my subscription to Clay-Worker for another year. I take great interest in all things pertaining to brick, and I think the Clay-Worker is the best brick paper published. I often derive much pleasure and not a little profit from the instructive articles in its pages. For two years I have devoted my entire time to making brick by the dry press process, and often wish that more of your contributors would direct their efforts to that purpose. As it is, I get a great deal of information from their monthly offerings.

I notice particularly the descriptions of brick works in different parts of the country, and the views of them that appear from time to time. I like to know what the brickmakers of other sections are doing and how they do it, and as some of your many readers may be interested in what we are doing



LEE DUNN, Stonington, Miss.

here, "way down South." I send you some photographs of our works, which are located at Stonington, Miss., a little more than one hundred miles north of New Orleans. The plant is a good one and represents an investment of about \$85,000. We have a four-mold Boyd press, one Flood down-draft kiln of 200,000 capacity, and three round down-draft kilns of 70,000 capacity each. So far we have dried the brick in the kilns, but may put in a steam dryer in the spring. The plant is situated in the center of three hundred acres of good clay, which burns a beautiful red. There is also a vein of good fire clay. We watersmoke with wood, which is laid down on the yard for about 75 cents a cord, and finish with coal costing about \$3.00 per ton delivered. There is in this section a fair demand for face brick at \$10.50 per thousand, and up. We do quite a little business in raw clay, shipping same to New Orleans and different points.

Business of all kinds is at a standstill now, owing to the

yellow fever epidemic. We think that the worst is over, and that we will soon be free from that scourge again, and that then business will rapidly pick up, when we hope to make up for lost time.

I hope to be able to attend the next N. B. M. A. Convention at Pittsburgh, for I know it pays to rub against the bright fellows composing that organization.

L. D.

Stonington, Miss.

Written for the CLAY-WORKER.

THE USE OF STEAM IN BRICKMAKING.

BY CHARLES H. MELCHER.



IT IS DIFFICULT, in this progressive age, to advance any theory that is universally new. The spirit of investigation is so manifest in the brick trade at this time as to make it well nigh impossible to disclose any valuable idea that has not been the subject of some thought, and perhaps trial, by some energetic man in the business. At the risk of being called a vendor of ancient history, a prosy purveyor of exploded theories, I have deemed this subject worthy the consideration of every brickmaker.

I recall with pleasure an interesting experience of over twenty years ago connected with the burning of brick assisted by the application of steam. The owner of the patent right of this invention was a man learned in all the theories of light and heat, but his ideas in regard to the use of the same were,

great distance to force the heat in order to reach the center. The smallness of the arch had a great deal to do with his inability to drive the heat properly into the kiln.

While making the alterations the old professor was frequently told he was attempting an impossibility, but he never took kindly to such criticism, and persisted in having his own way in the matter. It was discovered, by practical test, that it was true he could not drive the heat such a long distance through such a narrow passageway, and his invention, thus applied, was an abject failure.

After the old professor had permanently left us, it was suggested that we set the kiln again and in the center pile about two lineal feet of brick tight, and have them so from top to bottom. This was done, and the kiln was burned one-half at a time. I wish the brickmaking world could have seen those two bunches of brick. For uniformity of color, superior strength—in fact, for everything that goes to make a perfect brick, they surpassed everything that had ever been seen in a yard accustomed to rare good burning. A one-half portion contained a number of courses of press brick, hand-made, and I assure you of my truthfulness when I say that all of them, except a few hundred, were sent to a very particular job at Fort Edward, N. Y., and that they gave the customer the highest satisfaction. They were loaded direct from the kiln, and required no sorting for color whatever.

Now, says he of little faith, why did you fail to continue the use? Why was it not a perfect success in every particular? What good, substantial reason can be assigned for your final rejection of it? I am constrained to confess that the reason



WORKS AND WORKMEN, Stonington Brick Co.

at least to our uncultivated brickmaking minds, ridiculous indeed. After gaining consent to alter one of our old style Dutch kilns to suit his purpose, he arched in the ash-pit. This made a very small arch indeed, and of course had proper openings at top to allow the passage of the heat upward into the kiln. His fire boxes were built outside of the kiln wall, and contained, if I remember rightly, about five feet of fire surface. Now, as the kiln proper was forty-two bricks wide, this was far beyond the average width at that time, and his fire boxes added five more feet on each side; the thickness of the walls must also be added. It can readily be seen he had a

this happy condition was not attained was because we figured it cost too much to make the steam; there was not sufficient economy in it to commend it to our parsimonious minds. I am sure the kiln proper did not consume any extra fuel; it was the generation of the steam that made the fatal cost and debarred its use. But, says an inquiring mind, if you could burn your brick as you describe, why did not the superior character of your burns more than compensate for the extra coal used for steam purposes? Had we been producing high-priced colored and fancy bricks, like those of present use, it would have largely paid, but our products at that time were chiefly of the lowest grade.

The brickmaker of to-day should consider the fact that those in the business a score or more of years ago felt a greater hesitation in taking hold of anything that seemed like an innovation. He looked suspiciously upon new methods, and frowned severely upon what, afterwards, were proven to be the greatest benefactions.

The present manufacturer does not hesitate in going to the greatest expense in the construction of down-draft and other modern kilns, notwithstanding the fact of their great cost and extraordinary consumption of fuel. He is presumed to know what is to his business advantage, and doubtless does know.

If some one using "Dutch kilns" will introduce a steam jet into the fire holes and ash-pit—it need enter but a few inches, and a very small pipe is obviously necessary for the purpose—

and without any hazard to the successful burning of your bricks. In this case the placing of the pipes for the introduction of steam cannot involve any serious cost, and boilers sufficient for this purpose can be hired for a small sum. The safety of your kiln is not jeopardized at all, as a return to the old way can be done in a few moments.

In these latter days the smallness of the cost of an experiment does not seem to be in any way an attraction; the glory is measured by the immensity of the sum risked. Some cheap, though valuable, improvement in a wheelbarrow is too insignificant to receive any notice, yet thousands of dollars are cheerfully spent to test the merits of some foreign-born kiln.

This use of steam, plainly applied to the plainest of kilns, may have been tested by some of your enterprising subscrib-



PRESS ROOM AND CREW, Stonington (Miss.) Brick Co. See Page 357.

he will find he has a diffusive agent that beats the world, and one over which he has the most perfect control.

Having the steam thus introduced, a great economy in the use of fuel can be obtained (this we never thought of at the early trial before referred to) by covering the top of your kiln with sand or clay. If you were depending on natural draft, of course such action would prevent your fire from burning; your steam makes an artificial draft that causes your fire to burn with all the vigor you desire.

What a wearisome, unassisted journey the heat has from the bottom to the top of kiln when depending on natural draft only! The wonder is it gets there as quickly as it does. When some method is devised utilizing the heat that necessarily escapes from every kiln of this kind, and using it for steam-making purposes, then the greatest advantage of this substitution will be appreciated. It cannot be sensibly denied that the possession of such perfect command over the heat used in your burning is a matter of the highest importance. The existence of cold spots, or spots which, though hot, refuse to settle, are happily avoided, for the reason that, aided by the steam, you can throw the heat to any part. It is under your perfect control.

Experimenting is to be commended if it can be cheaply done

ers with an unsatisfactory result. If such is the case, it would be of great interest to know the prominent features of their failure, or the confirmation of what has been herein said if they have made it a success.

"IS IT LUCK?"

We often hear people speak of lucky men who seem to be successful with everything they undertake. As a rule, this talk of luck is nonsense. Those persons are successful because they keep their eyes open, study conditions and carefully reason out the probable results. Thus, any action that they may take is the result of clear, close thinking, hence its success. Let us give an instance of this kind of luck. A few of the people who contemplate building are pushing operations; many, very many, are waiting for good times to come to assure them of a profitable investment. The person who is building now is building at a time when, though there are indications of exceeding briskness in a few months, yet there is a decided lull in building operations. In consequence, material is cheaper than ever before, while contractors are taking work at figures that will, if they allow themselves fair wages, more often leave them with a deficit than a profit. One man,

being sure of the coming prosperity, has taken advantage of the present conditions and secured his building for a comparatively small outlay, and will be ready to make the most of the good times. The other waits for good times to come—perhaps he waits a little longer to be sure it is no passing boom—then he builds when both material and labor are dear, and half of the time of prosperity, when he must make his investment pay, is gone. Is it luck?—Western Architect.

Written for the CLAY-WORKER.

THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Seventh Paper.

BY E. G. DURANT.



HAVING CONSIDERED in former papers the manufacture of ornamented hollow building blocks and the outfit deemed desirable for producing them, we now turn our attention to the use of the blocks as employed in building construction in order to answer more fully the questions of their adaptability to meet the various requirements of architects and builders.

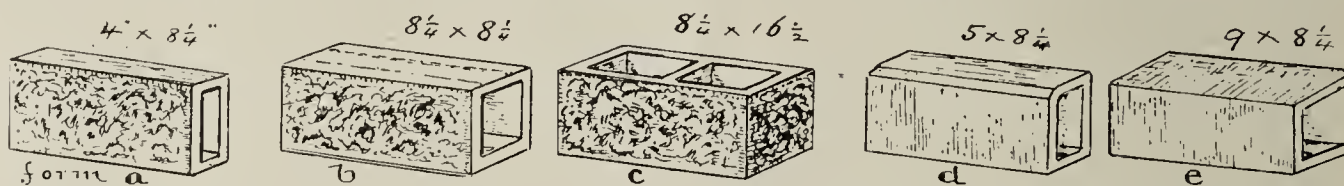
As we are addressing ourselves primarily to clayworkers and not to professional builders, we must treat the matter in a manner more elementary and more in detail than we otherwise would, giving attention to the requisite outfit of dies and ornamenting rollers necessary for producing certain results. We must take our stand with those whose ideas of the business have been confined to one block form only, cut to a length about double their height for wall purposes generally—the chambers lying horizontal—and to half the length for corner blocks, to be set vertical. Such were the blocks referred to in the paper read before the Illinois Convention of Clayworkers at their last annual gathering, by Mr. Mamer and quoted in full in the last issue of the Clay-Worker. The writer of that article

the country outside of the region of pine forests, and the time ought not to be far distant when a supply of such blocks can be had in every market town of 2,500 or more inhabitants through all the great central region. The brick or tile manufacturer who can command a good, tough, plastic clay that will burn to a good color and who has not a market in other lines of goods established for all he can produce, who does not take advantage of the opportunity presented for enlarging the area of his market, the number of his customers, and, incidentally, to the size of his bank account, may be fairly characterized as being either without ambition or as stupid, to which frank expression of opinion we expect a hearty amen from this class of workers in the early future.

Turning from this class of plain blocks, which are sometimes ornamented by chipping the face after burning, as has been stated by Mr. Darnell and before referred to in these papers. We present this house as representing the starting point in ornamental hollow block manufacture, since which great strides have been made.

We now present an illustrated list of block forms which we deem not only desirable, but indispensable in making up any outfit for the successful manufacture of ornamented blocks. For convenience in reference we attach a letter to each form. Referring to cut of house just shown, it will be seen that there are no water tables and no window sills, the lack of these in buildings erected from blocks at an early date, properly enough, condemned the blocks as inferior building material, since it is well known that such features are deemed essential in the most ordinary wood construction.

We first present a group of five blocks, which does not, however, make up one full list of forms essential, but we will stop to consider what may be done with these alone. Notice that the blocks "d" and "e" are three-fourths of an inch wider than the others, in order to permit of a projection of three-fourths of an inch from the face of the wall and so secure a good water drip, as well as to answer the demand of good taste. With this list of blocks we can construct good, sub-



and Mr. E. F. Darnell, of Ohio, who, in the annual gathering of the Ohio clayworkers in 1896, presented a paper on the same subject, contained in your issue of March, 1896, represent the best informed who are engaged in the manufacture of this class of goods (we refer to those not engaged in the manufacture of the improved ornamental blocks), and their respective presentations of the subject are to be commended. The structures built of such single form of block have undoubted advantages over those built of either brick or lumber, while costing less than the former and not more than the latter, securing as they do for the occupant a greater degree of warmth in winter and coolness in summer, while in no wise lacking strength under strain or in length of life, requiring no furring or lathing, as do brick structures, and no lath or painting of outer walls as do wood. Such blocks are not without a certain rugged beauty when properly laid, in the use of colored mortar and not with a thick, staring, white mortar joint, and ought to command the interest and attention of builders for many good reasons not now repeated. They certainly secure to the occupant a larger amount of comfort for a given outlay with less cost for maintenance than do structures of brick or wood.

It can be shown that such blocks, made at points near which they are used, can be supplied to the consumer at prices that will yield the manufacturer a handsome profit and yet admit of buildings being constructed from them that will cost less than a good class of wood structures throughout most of

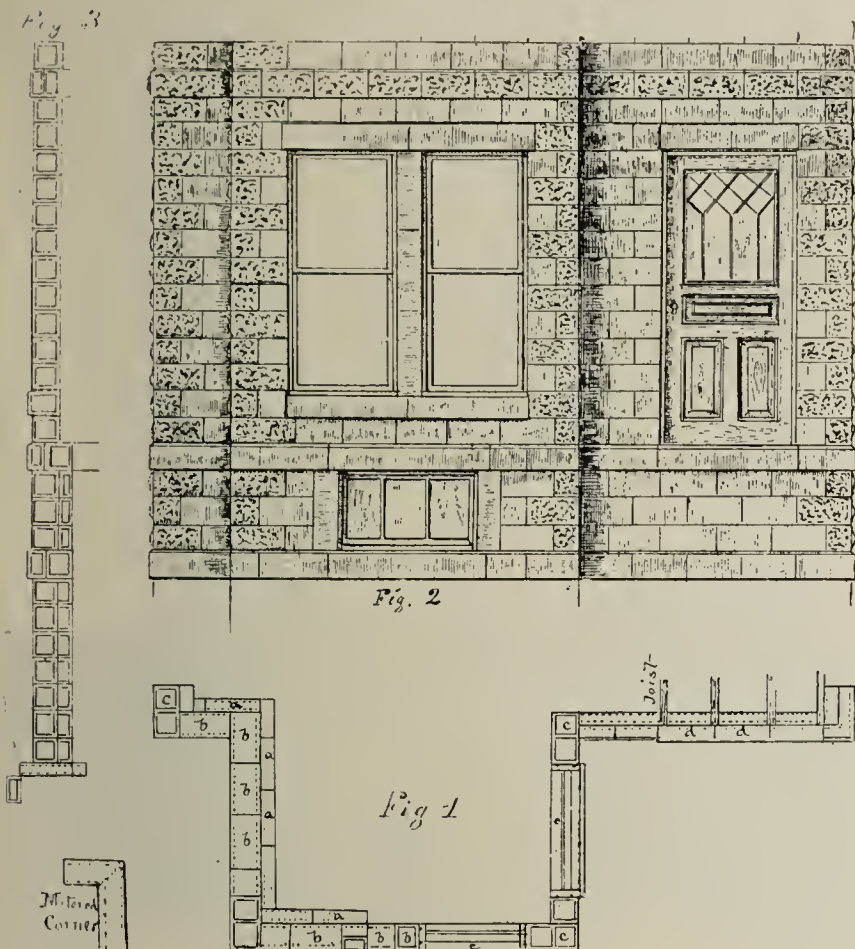
stantial structures, with walls 8 inches, 12 inches, 16 inches and upward in thickness. Houses, however, that will have only right angles in bays and projections, which, in these days in which 30 and 45 degrees angles are so conspicuous, means a great curtailment of the ability of the manufacturer in meeting popular demands.

In figure 1 we present a plan of a section of the walls of a house and in figure 2 an elevation of the same, which we will use to illustrate and make plain to our readers the method of handling these blocks to produce certain results. We leave out of mind for the time being the discussion of design or ornamentation and will deal strictly with forms.

Commencing with the plan (figure 1) and at the left hand a section of the basement wall is shown embraced between x—x (seen both in figures 1 and 2). This wall is shown as 12 1-2 inches thick and is made up of a facing block "b" and a plain backing block "a," with blocks "c" at the angles and a section of block "d," supplied with external ribs to hold the window frame in position on one side and to enter the abutting ends of blocks "b" on the wall side, securing an interlocking lap joint. It is cut to a suitable length and set on end to make a casing for one side of the basement window, while a section of the water table is made to do duty as a cap for the same window, being cut to a suitable length for this purpose. The window casings thus formed projects three-fourths of an inch, the same as the water table, and a very excellent effect is secured.

We now refer to the wall section in both plan and elevation

embraced between y-y, which, it will be seen, includes a part of the bay on a plane through the windows to the door. We call attention to the fact that a "b" block set on end and provided with external ribs to receive the window frames forms



made to do duty as a footing course. This for a 12-inch cellar wall on good, firm ground is deemed ample for the purpose. If the ground is wet or springy it may be nicely drained through such footing blocks, the floor of the cellar being laid a little higher and a line of plain "a" blocks being laid parallel with the wall on the outside just below the footing course.

It will be seen how happily blocks enter and meet the various demands of the builder and how they can be made to do duty beyond any other building material.

We next call attention to the basement window sill course, which may, without any extra cost, be made a lower water table course. This would give a pleasing effect and besides serve to bind the two walls together at this point, as it will be seen that the 8 1-4-inch backing block laps upon the 8 1-4-inch facing block, which lies below it.

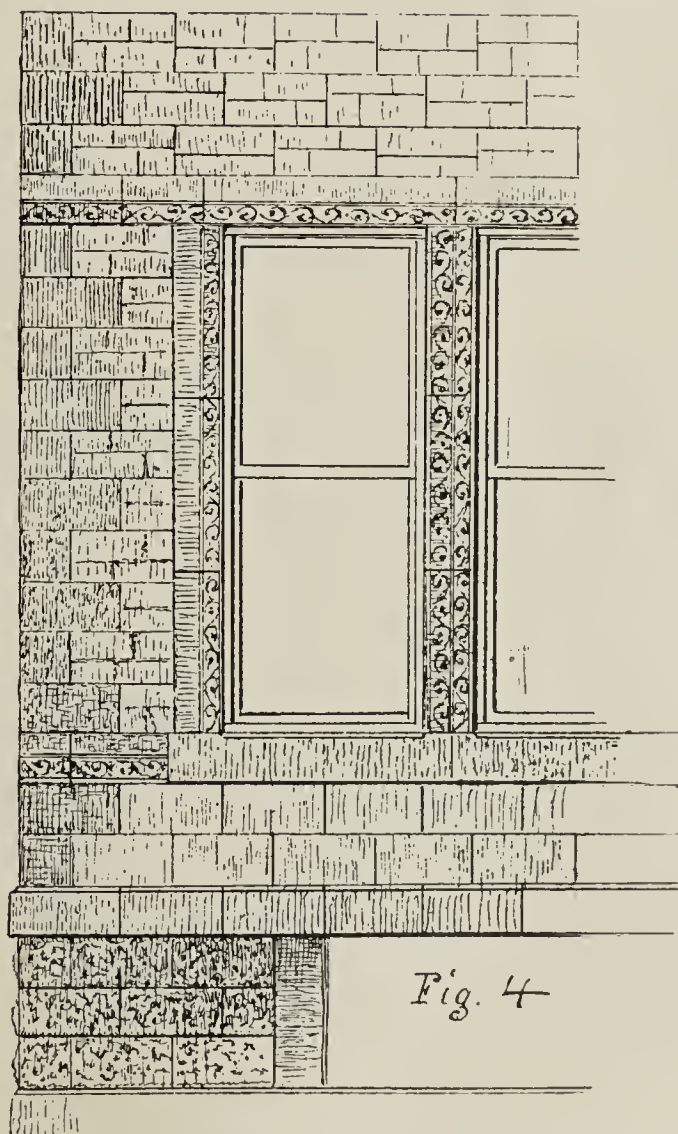
Notice also that the upper water table course is naturally the first floor joist course, and a shelf is formed after the water table has been laid that permits the floor joist to be supported by three instead of two vertical block walls. The backing blocks "b" laid between the joists terminate the 12-inch wall, and it will be observed that the wall block next above laps over the double course of blocks below it and so binds the two courses of the lower wall together again. We will call attention here to the fact that a double course wall may be bound together at any desired point when constructed of broad and narrow blocks by reversing the order of their laying.

We will now give our attention to the number and character of ornamenting roller dies needed to perform the work shown in figure 2. For ornamenting the faces of blocks "a"

the mullion of the double windows, and that half sections of the same block, alternating with blocks "c," form the outer casings of both windows and doors. In case there should be more wall space between the corners and windows, the blocks "b" could be cut to longer length and made to do duty for window casings, and this will be found desirable in some cases, as will be seen when we discuss ornamentation.

We now refer to section of wall shown in both figures 1 and 2 on the line between z-z, which is drawn on this plane of the elevation in order to show the use of blocks in a course that receives the floor joist, and also to show how a belt course may be provided at this point that will add a pleasing architectural feature. The wall here is shown to consist of two courses, the outer one being the "d" block, which projects beyond the wall face three-fourths of an inch, as before stated, gives emphasis to the course and is of value also as diverting water drip at this point. A shelf of four inches is left inside of the facing blocks on which the ends of the joist rest, as shown, and plain "a" blocks are cut to a suitable length to fill in between the joist, as shown in figure 1. These joists are laid to correspond with the full length of a block and are thus 16 1-2 inches from center to center, but it is evident the inner course of blocks may be cut to any desired length to fill in between joists as they may be laid. It is desirable that the inner course be made to break joint with the outer course. In case the "d" block is used as shown, the corner block "c" must be dispensed with in carrying around this course, as it can not be laid to project beyond the face of the wall, in which case two sections of the "d" block are mitred and pasted before burning, making a corner brick, as now sketched, the shorter face being 8 1-4 inches and the long one 16 1-2 inches.

In figure 3 we show a vertical wall section in order to make clear the method of laying foundations, which may be recommended as being very satisfactory for this class of structure, as well as to bring out some other points worthy of attention. As will be seen, an "a" block laid transversely to the wall is



and "b" and the short or end face of "c" rolls with 8 1-4-inch face are required, and as these blocks are shown with both rock and tooled faces, one roll of each design will be required. The corner blocks are shown only as rock faced; an additional roll with 16 1-2-inch face will be required for this work, the

roll for the end being already provided. Blocks "d" and "e" may be treated with the same tool-faced roll provided for "a" and "b." Three roller dies, then, would seem to meet all the requirements imposed in the construction of walls like those shown in figure 2, but with one more 16 1-2-inch roller die (too-faced) a treatment the reverse of that shown may be secured, viz, a building that shall have tooled corners and turning blocks and the balance of the house show a broken-rock face. There need be no dull uniformity in treatment, even with this limited number of blocks and roller dies, for it will be perceived that variety may be secured by the introduction of tooled-face belt courses, gables, etc., etc.

We introduce figure 4 as a hint of what further variety may be had by the addition of roller dies for securing a broken ashler tooled block and three narrow-faced rolls, viz, 4 1-8-inch, in order to the introduction of a scroll or other ornamental designs for the ornamentation of window and door casings and belt courses. One of these may be a tooled-face and the other two must be alike in order to work in pairs in the ornamentation of mullions. We may assume that in figure 4 we are looking upon a section of the same wall shown in figure 2, with simply a different roller treatment. It will be noticed how effectually the introduction of the ashler block breaks up the sameness that must attend a building that is constructed of blocks apparently of but one size and how thoroughly the complaint of "clumsiness of appearance," which may properly be charged to blocks of 8 1-4 by 16 1-2 inch face when used alone in the construction of buildings of modest proportions may be disposed of. While we do not reduce the size of the blocks, we do it in effect when we make each block represent four blocks of smaller and of varying size.

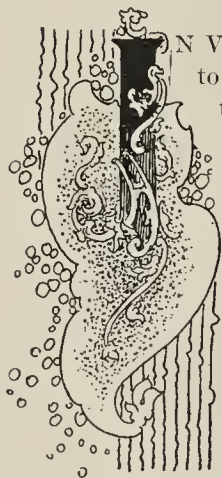
[To be continued.]

Written for the CLAY-WORKER.

INTERESTING WORK OF A NOTED CHINA PAINTER.— "MONITOR" CHINA.—"MURRHINES."

Some Diamond Jubilee Souvenirs—Reproductions of Historical Plates.

BY EDWIN ATLEE BARBER.



AN VIEW OF the movement which is now on foot to raise the ironclad Monitor, which defeated the Confederate ram Merrimac in March, 1862, and which was sunk off Cape Hatteras in December of the same year, it will be interesting to china collectors to learn that on board of her there is supposed to be a full service of English china which, probably, will be found to be in excellent condition, should it ever be brought to the surface. The ware was furnished by Messrs. Davis, Collamore & Co., a New York firm, a short time before the vessel was ordered out to sea. There was not sufficient time to have the china appropriately decorated, so each piece was marked "Monitor" in gold in old English letters. This work was done at the last moment by the prominent china decorator, Edward Lycett, now living in Atlanta, Ga., but at that time of New York City. This china consisted of table and toilet ware, without any other decoration. Curiosity hunters and antiquaries will await with interest the work of the submarine dredgers, and if pieces of the ware should be found in good condition they will find ready purchasers.

The name of Lycett suggests other decorative ceramic work of historical interest, such as the design of the china of the Lincoln Administration, used at the White House; reproductions of royal services, such as the china ware made at Sevres, France, for Marie Antoinette, Louis Philippe and Louis Na-

poleon, the originals having been printed in gold, while the American copies of Lycett were painted by hand.

The reproductions of the Martha Washington china that were sold in New York in 1876 and since were also done by Mr. Lycett from original pieces in the National Museum, Washington, and these were such exact copies that they have more than once deceived experts, a comport having sold at public auction within the past five years for \$250 to a New York collector, who did not discover his error for some time. Yet, while these reproductions could be purchased for \$2 each or less, an original plate in good condition would now command the price of \$1,000 or more.

Recent experiments by Mr. Lycett in glazes have resulted in the discovery of a method of reproducing iridescent effects on pottery similar to the metallic lusters of the ancients, and by another step in the same direction he has at last, as he believes, penetrated the mystery of the "Murrhine" vases of antiquity. These, it is well known, have always been in modern times a puzzle to the antiquary and the ceramist. What was Murrhine? Was it a glass or pottery or carved natural stone? Opinions are almost as numerous on this question as the number of those who have investigated. Some believe the substance to have been burned clay perfumed with myrrh; others



REPRODUCTION OF THE CHINA WARE MADE AT SEVRES FOR MARIE ANTOINETTE, LOUIS PHILIPPE AND LOUIS NAPOLEON.
Decorated by E. Lycett.

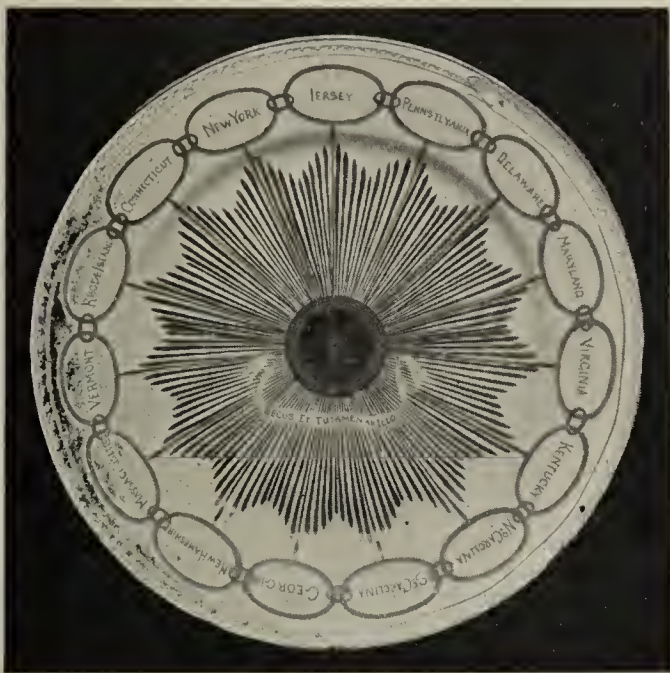
claim that it was a precious stone—onyx, alabaster, sardonyx, opal, flour-spar or agate—and still others contend that it was a natural stone, carved and afterwards covered with an artificial glaze. A controversy has been going on for upwards of three hundred years as to the nature of Murrhine; yet, while vases of this material were evidently quite numerous at one time, according to early writers, who can identify a single genuine example to-day? All that we are certain of is that they were very highly esteemed many centuries ago and that they brought fabulous prices.

The material is said to have been translucent, with colors which blended into each other in veins of red, purple and white, with iridescent effects and occasional dull spots in the polished surface.

Mr. Lycett advances the opinion that the original Murrhine was soapstone or talc, carved in the forms of vessels and covered with iridescent glazes by passing them through the enameling kiln; and in proof of his theory he has produced some very satisfactory experiments on these lines, which show the

variegated coloring of the lustered glazes on the steatite, through which are seen dull spots, where the glaze has not taken hold.

Pliny states that the Emperor Nero paid 300 talents (a sum



A MARTHA WASHINGTON PLATE. Value \$2 or \$1000, which?

equivalent to about \$360,000 of our money) for a single Murrhine cup. Among the wealthier of the ancient Romans there was much rivalry in the ownership of Murrhine vases which were supposed to have come from the far East.

With antiquarian exactness the author of *Quo Vadis* aptly refers to this ancient fad where, after describing the burning of Rome, he puts into the mouth of the wealthy Petronius, *Arbiter elegantiae*, Roman senator, adviser of Nero, who is contemplating the possibility of his own enforced death, these words:

“ ‘I am sorry for Eunice and my Murrhine vase; but Eunice is free and the vase will go with me. Ahenobarbus (“Red-Beard,” an epithet applied to that brutal Emperor) will not get it in any event.’ ”

Then farther on, where Petronius presides at his last feast, "he raised aloft the Murrhine vase, which resembled a rainbow in brilliancy and was simply beyond price.

“‘This,’ he said, ‘is the one out of which I poured in honor of the Lady of Cyprus. The lips of no man may touch it henceforth and no hand may ever pour from it in honor of another divinity.’

“He cast the precious vessel to the pavement, which was covered with lily-colored saffron flowers; and when it was broken into small pieces he said, seeing around him astonished faces:

“ ‘My dear friends, be glad and not astonished. Old age and weakness are sad attendants in the last years of life. But I will give you a good example and good advice: Ye have the power, as ye see, not to wait for old age; ye can depart before it comes, as I do.’

"He beckoned then to the Greek physician and stretched out his arm. The skilled Greek in the twinkling of an eye opened the vein at the bend of the arm."

And thus the Murrhine vase of Petronius, more valuable than that owned by Nero, did not, at the last, fall into Caesar's hands.

Whether Mr. Lycett is on the right road that leads to the discovery of the true nature and methods of production of the mysterious Murrhines remains to be seen. His further experiments will, at least, be awaited with much interest.

The occasion of the celebration of the sixtieth anniversary of Queen Victoria's reign (strangely called the "Diamond Jubilee") brought forth a multitude of memorials in England

and a few in this country. Among the various objects in metal made abroad and imported by enterprising American merchants are souvenir spoons of numerous sizes, ranging from the dainty after-dinner coffee spoon to the giant "mush-stirrer," more than a foot in length, bearing a variety of appropriate engraved and repousse devices.

In some of the shop windows in New York, Philadelphia and other cities large numbers of metal cups may be seen, cylindrical in form and covered with enamel, on which are colored emblems and a portrait of the Queen. It is a companion to the souvenir cup which was produced for the celebration of the coronation of Czar Nicholas II., at Moscow, in 1896, the distribution of which resulted in the panic which destroyed so many hundreds of human lives.

The potters, however, made more of this opportunity to produce special designs than the metal workers. There are jubilee jugs and pitchers, Victoria tea cups, plaques and a multiplicity of ceramic ornaments and bric-a-brac.

By a new process of printing on pottery, in lieu of the old "Decalcomaine" method, it is now possible to transfer to the ware designs in many colors by one operation. It was not easy to print on the old-fashioned tissue paper several impressions of different colors. Now the thin paper is made to adhere to a thick paper and on the surface the many-colored designs are printed. To transfer the print the thin paper holding the design is peeled off and applied to the surface of the ware as formerly. So the potters have taken advantage of this invention to produce in large numbers devices relating to the Diamond Jubilee. These "duplex lithographic transfer papers," as they are called, can be purchased in wholesale quantities, and when transferred to the ware the designs bear a close resemblance to careful, hand-painted work, and, of course, greatly cheapen the ware on which they are used. This method of ornamentation is being employed by china decorators in the United States. Mr. William Lycett, of Atlanta, Ga., procured a supply of prints bearing the royal portrait, British flags and insignia and produced some jubilee plates of more elaborate design than any that have come to us from the English potteries, using the transfer print as a central device and supplementing it by hand work—a border composed of a chain inclosing the names of the Queen's possessions, done in gold on an



DIAMOND JUBILEE SOUVENIR.

ivory-tinted ground. Around the bust are inscribed certain lines from the jubilee hymn, which was composed by one of the bishops of the English church:

"Oh, royal heart with wide embrace
For all her children yearning,

Oh, happy realm, such mother grace
With loyal love returning.
Where England's flag flies wide unfurled
All tyrant wrongs repelling;
God made the world a better world
For man's brief earthly dwelling."

There are four stanzas of the hymn, beginning "Oh, King of kings," and it is said that the Queen has ordered that it be printed in the prayer book of the Church of England in the future. The music for it was composed by Sir Arthur Sullivan.

Mr. Edward Lycett is an Englishman, who came to this country early in the sixties and who painted the dinner service of china for the White House during Mr. Lincoln's second term. While thoroughly Americanized, he still takes great interest in the events which transpire in his native country. Thus, in co-operation with his son, he has produced these souvenir pieces for the purpose of supplying a certain demand for such things in this country.



OFFICIAL ANNOUNCEMENT.

**Pittsburgh the Place, February 15-18 the Time,
for Twelfth Annual Convention of the National
Brick Manufacturers' Association.**

To the Members of the N. B. M. A.:

IT IS with much gratification that we submit the accompanying invitations from the brickmakers, Builders' Exchange and city officials of Pittsburgh and Allegheny, Pa., to hold our next yearly meeting in that city. Much the same conditions now prevail that made the choice of Buffalo so satisfactory last year. For this reason it seems equally necessary to again hold our Convention at a point most easily reached by a large majority of our members. Pittsburgh's central location offers this advantage, and as her brickmakers, who have taken an active part in our work for years past, are now again organized and unitedly desire to welcome us to their city, we deem it best to meet there Tuesday, February 15, 1898.

In arriving at this conclusion, we are not unmindful of our obligations to the New England members, who have been so faithful in attendance at every Convention during the past decade, and who have so cordially urged us to come and partake of their hospitality. We take this opportunity to thank them for their invitations, and assure them that we look forward with pleasant anticipations to the time when conditions will justify their acceptance.

In due time arrangements will be made as usual for reduced railroad rates, hotel accommodations, etc., etc., which will be fully set forth in subsequent announcements.

THE EXECUTIVE COMMITTEE.

By W. H. BRUSH, President.

T. A. RANDALL, Secretary.

Pittsburgh's Invitation.

To the Executive Committee of the National Brick Manufacturers' Association:

Gentlemen—At a called meeting of the brick manufacturers of Pittsburgh and vicinity it was unanimously voted to extend to your honorable body an urgent invitation to hold your next annual Convention in this city, and your humble servant was appointed chairman of the committee to look after the matter and complete arrangements for a Convention, if our invitation

is accepted. We believe that Pittsburgh offers unrivaled facilities for Convention purposes, its central location and splendid railroad facilities enabling many to gather here from points East and West, North and South, who can not be prevailed upon to go to cities less easily reached.

On our part, we promise, to a man, to do everything in our power to make the Convention a success. Believe from past experiences that we can make it very interesting for the members of the N. B. M. A., and promise a most cordial welcome to each and every brother brickmaker who will come within our gates.

Trusting that you will do us the honor to accept our invitation, we are

Fraternally yours to command,

GRANT DIBERT,

Chairman Committee on Entertainment.

Pittsburg, Pa., October 12, 1897.

The Keys to Pittsburgh.

Office of the Mayor.

Pittsburg, Pa., October 29, 1897.

National Brick Manufacturers' Association of the United States of America:

Gentlemen—It gives me great pleasure, in conjunction with the honored mayor of our sister city of Allegheny, the Hon. Charles Geyer, in extending to your association an earnest and cordial invitation to hold your next annual meeting in one of our cities.

In the event of your accepting the invitation given you and your decision to favor either Pittsburgh or Allegheny with your meeting, on behalf of our citizens we can say that they will be prepared to extend the hospitalities of the occasion and we will use every effort upon our part to make your gathering notable, pleasant and profitable. Very truly yours,

H. P. FORD, Mayor.

Allegheny, Too, Opens Her Gates.

Office of the Mayor.

Allegheny, Pa., October 29, 1897.

National Brick Manufacturers' Association of the United States of America:

Gentlemen—In behalf of our citizens and the brickmakers of western Pennsylvania, and in conjunction with Hon. H. P. Ford, mayor of the city of Pittsburgh, I take great pleasure in extending to your association a cordial invitation to hold your next annual meeting in our cities.

In the event of you accepting our invitation our citizens will be most happy to have you with us and will endeavor to make this a profitable and notable gathering of your members.

Yours truly,

CHAS. GEYER, Mayor.

Pittsburgh Builders' Exchange Bid us Come.

The Pittsburgh Builders' Exchange.

Pittsburg, Pa., October 26, 1897.

T. A. Randall, Esq., Secretary National Brick Manufacturers' Association:

Dear Sir—Permit me in behalf of the Pittsburgh Builders' Exchange to extend to your honorable body a most cordial invitation to hold your next annual meeting in our city, and to such of your members as can honor us with a call at our Exchange rooms, 409 Market street, we extend a most hearty welcome and will endeavor to show them every courtesy which our rooms afford. Hoping to be honored by your presence, I remain, yours very truly,

G. S. FULMER, Secretary.

EX-PRESIDENT MORRISON WELL PLEASED.

T. A. Randall, Secretary National Brickmakers' Association:

Copy of the convention report received. It is great—worth waiting several months for. The N. B. M. A. is progressing and placing mileposts and signboards along the route. This report represents a vast amount of labor and should be appreciated by our membership.

I think Pittsburgh a good meeting place for our '98 convention and have no doubt there will be a large attendance. The announcement of the local committee insures all visiting brickmakers a royal good time; everybody will enjoy this visit to the Iron City.

Business is fairly good here in spite of low-priced cotton and yellow fever. We have just finished shipping fifteen cars of repressed brick, which were used in construction of Sailors' Home at Savannah.

R. B. MORRISON.

Rome, Ga., October 25, 1897.

Written for the CLAY-WORKER.

REMARKABLE ILLUSTRATIVE PITCHERS. No. 2.

BY MRS. MARY E. NEALY.

TAM O'SHANTER. PITCHER. 1835. A HANDSOME large ice-water pitcher, of Rockingham ware. It was made in Hanley in 1835, and is of a strong bluish lavender paste, with the decoration entirely in relief. This consists of beautifully modelled pictures of the different scenes in Burns's Tam O'Shanter. Everyone has read this remarkable poem, so that the story need not be repeated in full. Commencing at the right side of the handle and continuing toward the left one may read of Tam's entrance from the cold, and warming his hands at the blazing fire, of himself and the landlady growing quite "gracious" to each other, and of himself and "Souter Johny" drinking together.

"Tam lo'ed him like a vera brither,
They had been fou' for weeks thegither."

The scene at Alloway kirk is omitted, for a very good reason. There is no room for it upon the pitcher. It is something



like the family picture of the Primroses in the "Vicar of Wakefield." But it is a scene so born of imagination and beer that one can do just as well without it and take the other half of the story, which is told by the artist to perfection, and by the poet even better. After apostrophizing and threatening the poor drunken wight, he continues,

"In vain thy Kate awaits thy comin'!
Kate soon will be a wofu' woman!"

Then came the pursuit of the witches.

"Now, do thy speedy utmost, Meg,
And win the key-stane o' the brig;
There at them thou thy tail may toss,—
A running stream they dare na' cross.
But ere the key-stane she could make,
The fiend a tail she had to shake!
For Nannie, far before the rest,
Hard upon noble Maggie prest,
And flew at Tam wi' furious ettle;
But little wist she Maggie's mettle;—
Ae spring brought aff her master hale,
But left behind her ain gray tail!
The carlin clautht her by the rump,
And left poor Maggie scarce a stump!"

Everybody that knows anything about witches knows that they cannot cross a stream of running water, so, although she did not get the sinner, Tam, she got the long gray tail of his faithful mare. This fact has evidently inspired the artist, for if you will but notice the beautiful pitcher closely, you will find that the very artistic handle is composed of the tail of the immortal Meg, clasped in the hand of the plump young witch, Nannie.

The circle which crowns the embossed poem is a rich relief wreath of thistles, and the entire piece savors of the "land o' cakes" and of Burns. Such a piece of china is a valuable heirloom in a family. This is the impressed mark:

"Published by

W. Ridgway & Co., Hanley, October 1. 1835."

Written for the CLAY-WORKER.

THE USE AND ABUSE OF CLAYWORKING MACHINERY. First Paper.

BY A MASTER MACHANIC.

THIS SUBJECT OPENS a large field for consideration to persons versed in the art of ceramics. How to test clay properly and the means for shaping the various forms demanded of this plastic material is the purpose of this treatise. In this introductory article we will only endeavor to give a synopsis of what we shall approximately treat upon in subsequent papers.

The clay industry, although an old art, is comparatively new, with the present system of mechanical appliances for its manipulation. Electricity, as well as the manufacture of clay articles were known to the ancients, but the use of machinery for producing either only came into general use in the latter part of this century. In fact, both arts have kept apace during the last fifty years, and the future generations will see them harnessed together, doing work whose effects were undreamed of fifty years ago.

As clayworking machinery has come to stay, a thorough education in its manipulation is demanded of the clayworker if he is to be successful. We have a great deal to learn yet in regard to clay in the application of machinery and its treatment. Mechanical forces have their laws, which can not be changed; so also, have the mechanical appliances in the clay industries. There is only one correct way in handling brick, pipe and potter's machinery. This we will try to impress upon the minds of our careful readers in these articles.

We stated at the beginning that this was a large subject. Many may not appreciate this, especially those who follow one particular branch of the industry, on which their minds are centered to the exclusion of the others. In order to show, however, to what an extent machinery is used, we will give a partial list of machines we shall write about. Brickmaking is undoubtedly the leading branch of this industry. We will therefore take it under consideration first, and enumerate its mechanical engine. We expected to commence with preparatory machinery, but find that it behooves us to commence at the beginning, which is the mine or clay bank.

As powder and other explosives for loosening the clay or shale from its primitive bed are only means, such too, are picks, shovels and drills, implements, we pass them by and commence by enumerating as follows:

Electrical and pneumatic mining machines, also dredges and steam shovels are the mechanical means for loosening the clay from the body of the earth. The last two also load the clay for transportation. Next transporting machinery. Under this head we have cars hauled on rails by means of winding drums, gravitation or endless cables, to which electricity will soon have been added. Conveyors by endless belts or chains, self-dumping buckets and self-loading wagons. This brings the material to the

—Crushing Machinery.—

Here we find dry pans, wet pans, clay mills, jaw crushers, roller crushers, disintegrators and granulators. All of these are of various kinds and differ greatly in their construction.

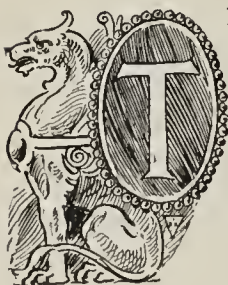
From these reducing machines many of the dryer clays pass over screens. Of these there are three distinct kinds, namely, stationary, rotary and shaking screens. These are often a very bothersome necessary evil, owing to their misconstruction or inaptness for the particular kind of clay. After the clay is screened, referring to the kinds which require it, we come to the mixing machinery. Of these we have steam mixers, pug mills, etc. Elevators and conveyors, of course, are used in many places to handle the clay before water or steam is admitted. These also will be considered in their construction and use.

The brick molding machines then will engage our attention. Of these we have a great variety. We will enumerate those which we will pass in review: dry presses, semi-dry presses, augur machines, plunger machines, and soft clay machines. In connection with the augur and plunger machines we have the cutting table for hand or automatic power. Repressing machines have also come in use very largely during the last seven years. These will also be referred to. Hollow block and tile machinery, with their appliances, will also be touched upon. For the finer grades of brick the clay is often worked and filtered. This class of machinery will be treated later on, under the head of potter's machinery. While speaking and writing of the use and abuse of clayworking machinery, it will clearly be seen that we can not do the subject entire justice unless we also speak of the manipulation of the material itself, both in its raw and molded state. This becomes self-evident, when we assume, with the writer, that the subject would lose in interest and in its intention to instruct, if we confined ourselves to the machinery alone. Furthermore, we shall not confine ourselves to the particular machine under consideration, but often follow the successful operator through the whole process and probably, also, those not so successful. With these facts apparent our retrospection and experience as looker-on and critic may make us follow the directing force along with the material, possibly to the dryer and kiln also.

(To be continued.)

Written for the CLAY-WORKER.

CREAM-COLORED BRICK—HOW THEY ARE MADE IN MILWAUKEE.



HERE ARE BRICK—AND BRICK. To turn out the former is no trick at all. Anyone can do it. Given clay, sand and water, sticks and matches, and a protecting shelter, the making of the first variety is mere child's play. The making of the latter variety is, however, quite a different thing. It is very largely a matter of modern methods well interwoven with that article that is always staple—gumption. These thoughts

forced themselves upon my mind a few days ago when I made a tour of inspection at the yards of the Milwaukee Brick Company, situated to the best possible advantage at the extreme west end of the Cream City—Milwaukee, you know, got its title of "Cream City" from the color of its brick, and for this reason ought to be always interesting to brick men. There is benefit in being long established, of course, but in these days of machine production the main thing, after all, is to be up to date. This means that new and improved machinery must be employed, and that it must be selected from among the many offerings, with a large use of that quality already referred to—gumption. For this reason I was impressed with the plant of the Milwaukee Brick Company. It is emphatically modern.

The location of the plant could not be better. In the first place, it is situated on what may be called the hill section of Milwaukee, and in that section the clay is freer from lime than in other places. Then the yards are directly beside the tracks of the Chicago, Milwaukee & St. Paul, the Wisconsin Central and the Milwaukee & Northern roads, with side-track

facilities from each, so that the transportation of the product to all parts of the country amounts to little more than the mere loading of the cars. Moreover, the situation is a delightful one from the standpoint of the æsthetic observer, being surrounded by a landscape of wooded roads and green fields bathed in sunshine, with here and there a row of cottages on a newly-made street. If William Morris's contention is true, that the best work is that done by workmen who enjoy their work, good work ought to be turned out from the company's yard, for nature smiles there and the air is mellow. A fanciful nature might feel that the creamy hue of the brick came as part of the general harmony.

The Milwaukee Brick Company is three years old, and it began business with a Ross-Keller dry press, a Wolff Iron Clad steam dryer, a Penfield mud machine, and a Penfield 24-inch disintegrator. Last spring the company put in a Radford continuous kiln. All these machines work well, and the superintendent told me that the yards would be closed down because of the low price of brick if it were not for the economy of the continuous kiln. The yearly output of the plant is at the rate of from 65,000 to 70,000 daily, seventy men being employed when running full capacity, and the machines "doing the rest."

I was shown about the yards by Mr. Reinke, who is one of



HENRY HERMAN, President and Treasurer the Milwaukee Brick Co.

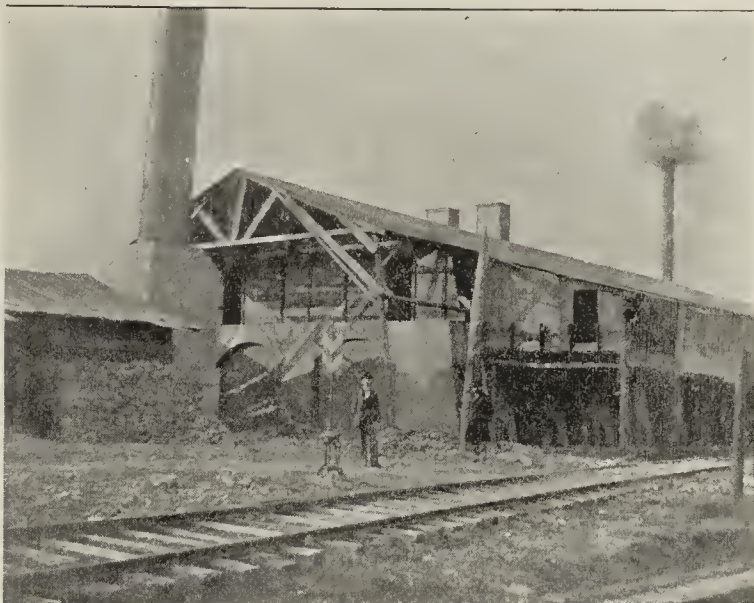
the members of the company, and who serves as superintendent and practical man. He is the busiest man in the yards, for he combines hand and head work, and could write a book on brickmaking that would be standard at once. He is a man of about forty years, and began business in this country in 1880. He is the life of the works. If anything goes wrong, he knows instantly just what is the matter, and if any question arises among the heads under him, he solves the problem at once. He works long hours. He wakes up thinking about brick, and brick is the last thing running through his thoughts at night. This may be wearing, it is true, but when a man is so interested as is Mr. Reinke, the details of the business he has to do with become recreation as well as duty, and he seems to thrive under it. He is very much interested in the rate-war now going on between city manufacturers, and thinks the time must come when they will come together again and make some effort to restore normal conditions. When, as at present, common brick are selling as low as \$3.50, there is no possible way for the manufacturer to make anything out of the business, accidents and other things being taken into considera-

tion, even with the strictest economy in every department of manufacture. Mr. Reinke went at brickmaking when he came to this country, and prior to that time he had practical knowledge of the making of brick in Europe. While methods are quite different on the two sides of the ocean, the fundamental knowledge required is the same, and this Mr. Reinke possesses in abundance.

Under his guidance I made an inspection of the plant, first taking a survey of the continuous kiln. Just now there is a ruinous rate-war in Milwaukee, and the brick business is decidedly demoralized. As a consequence, the economy in fuel used in the continuous kiln makes it possible to run the yard without a loss, and so the big kiln is never allowed to cool down. There is another reason why this kiln is kept at work. It is this: The experience of the company has been that to be

see also how hard they are, and how you can only chip off little pieces when you strike them very hard. In fact, they are as hard as rock, and nobody could ask for better brick than that, eh? This kiln has a tunnel of fourteen chambers, and each chamber holds 35,000 brick. While we are taking the burned brick out of one side, the chambers on the other side are being burned. I believe in continuous kilns. The principle is not new, as they were working with success in the old country before I left there, many years ago. It is very important, however, to get the men used to it."

Mr. Reinke then led the way to the top of the kiln, which is covered over with a shed, as shown in the cut. The scene presented was much like that depicted by the artist Dore in his illustrations of the Inferno—rows of pipe holes through which the fuel was fed down to the fires glowing beneath,



VIEWS OF THE WORKS OF MILWAUKEE BRICK CO.

valuable as a brick-baker it must be run right. The men must know how to handle it. The present is a good time to give them the needed experience, and results show, Mr. Reinke says, that as the men become more familiar with it, greater success is attained.

"According to the promise of the builder," said Mr. Reinke, "we should have one chamber burned and ready for delivery each day. So far we have not succeeded in doing this, but I think it is owing to the fact that we have only been operating it a few months, and also probably owing to the nature of the Milwaukee clay. For this latter reason I am not quite sure that we will be able to meet our first expectations as to output, but even if we do not, we shall still consider the kiln successful, for it certainly turns out fine brick. You notice when I strike them together how they ring like steel, and you

running in regular rows. Down at a farther end a man was engaged in dropping down fuel—strips of wood and blocks of coal. When the holes were uncovered one could look down into the seething flames and see the regularly piled brick, thirty-one high, in the process of being burned. At another point the brick could be seen where the firing was over, still giving out a ruddy glow as the heat receded. Mr. Reinke keeps two men at work constantly at firing, one working a day shift and the other a night shift.

Right here I may mention a contrivance of the superintendent's that may be useful as a copy for other yards using the continuous kiln. At the start he found that the top brick were impaired by watersmoke, and it seemed necessary to devise some means of getting over the difficulty. The result of his experimenting was a system of galvanized pipes convey-

ing the smoke from the cooling chambers over to the water-smoked chambers, conveying it with a down draft to the brick that had formerly suffered. The plan has worked admirably. The pipes do not run all the way, but connect with inverted galvanized troughs sufficiently large and long to lead along a whole row of fire holes, crosswise. Thus the heat escaping from these holes is conducted along the row to the pipe, and thence to the watersmoke hole. Something of this nature has been attempted in other places, Mr. Reinke says, but the greater part of the contrivance is his own creation. Thus equipped, the continuous kiln, he claims, makes better brick than is possible with an open-top kiln.

One of the most satisfactory machines on the plant is the Ross-Keller six-mold dry press, that turns out the pressed brick for which the Milwaukee Brick Company has achieved a reputation. It is not slow, like the mills of the gods, but it grinds exceeding fine brick, and the superintendent says he has not had a moment of delay or a penny of expense to charge against the press. With revolution after revolution, as regular as the tides, and a tirelessness only possible to machine production, 35,000 brick are born daily and wheeled out to the kiln especially erected for the product at the north end of the yard. It is only due, in passing, to quote literally what Mr. Reinke says of the Ross-Keller, even if it does raise an invidious distinction. "There are lots of machines in the market," he says, "and I have seen all of them, but if I had to buy a dry press over again I would pick out a Ross-Keller without a moment's hesitation. The machine we have weighs about 75,000 pounds. The trouble with most of those on the market is that they are built too light. We put in the Ross-Keller machine three years ago, and since that time it has not cost us an additional penny or given us a moment of delay."

In connection with the Ross-Keller machine a Frost 9-foot dry pan is used. This grinds the clay and sends it through a perforated screen to an elevator that takes it up to another screen on the second floor. By this time every bit of stone has been taken out of the clay, and it is ready to descend to the Ross-Keller press. Another satisfactory machine used at the Milwaukee Company's plant is the Penfield mud machine, with its decidedly ingenious plan of delivering the brick ready for the trucks that run to the dryer. Both the machine proper and the Penfield disintegrator that feeds it run as smooth as oil. The clay is brought from the yard up an incline on automatic dump cars, and they work without a hitch. When the load from the car has been dumped and the disintegrator gets in its work, the stones fly out of the hopper like a hail-storm topsy turvy. Here, as with the other machines of the plant, the excellent character of the clay beds on the premises is to be noted. It is certainly a great advantage to be able to have the best possible clay at hand in the northwestern part of the city, as the local demand is supplied almost from in front of the people's doors.

The mud brick turned out by the Milwaukee Brick Company are dried in a Wolff Iron Clad steam dryer. This was built in 1894, and has given perfect satisfaction ever since. It is an eight-track dryer, and has a daily output of 35,000. Mr. Reinke believes the Wolff dryer has saved him many gray hairs, for when the brick are once in the dryer he does not have to worry about the weather. It might rain a cloudburst and the brick would still be safe. The dryer is very substantially built, and is located midway between the continuous kiln and the building that contains the brick presses and the engine room. Tracks connect it with the other sheds, and this particular equipment of the plant is thoroughly carried out, and is a great labor-saver.

In conclusion, a word will not be out of place concerning the men who compose the executive force of the Milwaukee Brick Company. Henry Herman is President and Treasurer, Rudolph Reinke Vice-President and Superintendent, and C. Wenz is Secretary. Mr. Herman is interested in various concerns in Milwaukee and in the State of Wisconsin, and is daily rising to prominence as a financier and capitalist. He is still

a young man. Of Mr. Reinke I have already spoken. The company sends its product into several States, and has at the present time orders ahead for 200,000,000 brick. While I was conversing with the superintendent in his office to complete my store of facts about the business, he was called to the telephone to take an order of 400,000. All this, considering that Milwaukee brick men are just now in a most discouraging rate-war, augurs well for the product of the Milwaukee Brick Company.

FREDERIC F. HEATH.



LUCKY AND UNLUCKY HAPPENINGS.

YES, I BELIEVE IN LUCK. I know that certain scientific men, among them Prof. T. C. Mendenhall, of Worcester (Mass.) Polytechnic Institute, have endeavored to prove and come very near proving that there is no such thing as what we call luck—no chance in the world, but everything running in perfect accord with some great arithmetical rule. I have listened to Professor Mendenhall drive home every nail in the coffin of chance and really believed that it contained the corpse of my old belief in luck, and after all I believe in luck.

I can't help it. The daily history of every brickyard is full of it. There was Dinny Haley, the keenest-eyed man on Long's South Brewer brickyard, who stepped upon a nail and had his foot pierced. He threw the board containing the nail as far as he could throw it and after bandaging his wounded foot hobbled toward the boarding house. He was obliged to take a somewhat circuitous course and cross a bit of grass ground. When he reached the grass we heard him cry aloud with pain, and the first man to reach him had to draw that same nail from Dinny's other foot. That man threw the board and the nail away and that night he went nosing round by the bank of the stream below the boarding house in light slippers and came home with a bleeding foot and that piece of board with the same nail in it upon which Dinny had been fixed. We burned the board and the nail and it ceased to give us trouble.

There was Jean Baptiste Dube, the stolid 6-foot Canadian from Isle Verte, Quebec, who was hit at the same place and upon the same spot and upon the same day of the week and hour of the day three successive and equi-distant times. The first time a piece of platting fell from the kiln and hit him; the next time the man on the top of the kiln attempted to throw the two parts of a broken brick over Jean's head below and one part failed to go over without touching. The third time Jean tossed up two bricks and the bricks didn't stay up. One of them came down on the same spot on Jean's head where the others had struck the week and the fortnight before. After this Jean was much afflicted with big head for several days, but he pared his toenails and washed his feet by the light of the full moon and threw the wash water over his left shoulder through the upstairs window and he hasn't been hit since, though he did come near getting another thump on the head when some of the water, after passing over his shoulder, insisted upon going in the bed with Charlie LaVoie instead of out of the window, as any self-respecting and well-behaved feet-tinctured water should.

I won't mention the machine that refused to grind good mud and the follower that wouldn't fill the mold well when a certain wall-eyed mule with a spavin drew the sweep, nor the man who escaped three times from the wreck of a crazy kiln shed to be afterwards laid up by a love tap from a broom handle in the hands of Kitty Maud, the chambermaid, who aimed it at the other fellow, nor the man who slept all night by the

outside arch and got up to chase the boy who had painted his face with clay just two short seconds before the outside arch collapsed in a seething mass of red-hot rubble.

But I will speak of a run of bad luck that will interest every man who ever burned a brick, and their sympathy will go freely to the unfortunate victim, who is now a wanderer in the wilds of Massachusetts selling 4-cent apple trees and 2-cent plum trees to ambitious farmers at \$3 apiece and sighing for the glory of the days that are no more—all on account of this streak of bad luck.

—Unlucky Kilns.—

This story is true, and as there is no dishonor in bad luck and honest poverty, I will name the victim. Judson Long was the son of a brickmaker who had made money and who wanted his son to be something better than a brickmaker, an impossibility, of course. But Judson was a school teacher when his father died and gave up school to continue his father's business. He was an honorable, honest, industrious and keen-sighted business man and knew enough about the brick business to make a success where any other could. But things went wrong as soon as the old man died. Market was treacherous, crews were worse and burning became a nightmare and a horror. The fortune left him dwindled through a dozen ways, and yet the morrow promised ten-fold reward for the losses of to-day. It was the last year 1889 and the outlook was never brighter. Long had secured contracts at handsome figures for half the ordinary output of his yard. Other jobs were in the wind. He secured a good crew and for two months the weather was very favorable. It looked as though fate was to give back to Long something of what she had taken from him in the past. Then we set fire to the first kiln. The kiln seemed to clear all right and they were to begin beating down upon the middle to spring it when someone discovered a small cold spot on the top of the kiln at the north end of the third arch on the west side of the kiln. They nursed this spot, but it actually widened the more they nursed it. They fired under it, they coaled under it, they poured oil down into it, they poulticed it with slabs, they built fires upon it, and still the cold spot grew. Fire dodged it and would not be forced near it. When the kiln was burned the spot had spread to three arches. They stood stiff as the day they were set with just a rim of two bricks' length burned around the edge. The second kiln was soon ready. Three arches set over from the first helped the growth of it. A new set of burners were hired and they were the best to be had. They were cautioned to carry even heat and slow in watersmoking. They knew their business and on the fourth day the kiln seemed clear. A search was made for a cold spot on top. It was found—a place barely warm—in the north end of the third arch in the west side of the kiln, the same location as the cold spot in the first kiln, which was yet partly standing where it was burned.

The burners loosened the platting to create a draft and fired slow on the whole kiln, but the spot, which had been barely warm, grew cold and spread. Long discharged the night burner, who was in no way to blame, and put on a man who had subdued balky kilns many a time; and the cold spot continued to widen and lengthen, and when the kiln was done there were three arches next to the west outside practically untouched by the fire. With the third kiln we took especial pains that the jets should be loose and built in flue form, and that the setting should also be loose and the top course tight. There was one new burner in this kiln and the cold spot came just as it had in the others and in spite of every precaution and effort grew in diameter until it had reached even larger proportions than any of the others. The fourth kiln was the same, the unburned arches in the west side of the kiln, but in this kiln the spot did not attain the size that it had in either of the others. Then the fifth and last kiln cleared and the small cold place showed itself. Judson Long was taken sick. When he recovered he was bankrupted; that cold spot had grown too. The grass is growing now where the kilns stood and large elm

trees have begun to reach up from the holes where the kiln shed posts were set, and a handsome man of intelligent appearance is peddling fruit trees in Massachusetts and shuddering every time he sights a brick kiln. The story is from real life, entirely true. Was not that the very soul of bad luck that influenced those kilns?

Bad luck is a merciless enemy. Fate is a heartless foe when she lands a man on the toboggan chute. Joyously and generously as she may lift him up, so, grimly and cruelly, she throws him down. There was one poor fellow whom fate had lifted with her generous hand from nothing to a comfortable and profitable brick business. He deserved all the good luck he got, so everybody said, and I guess it was so. Well, luck turned against him. At last he struggled through the horrors of a summer with debt hanging round him like a millstone and ruin falling as it fell this year in floods. He got some bricks, half a million or so, burned, and with keen foresight saw that if he could winter them that he would make enough to lift him out of the slough. His creditors were the agents of a merciless fate and compelled him to sell. He sold at a loss and closed the trade on the evening of November 1, 1872. A big fire visited Boston on November 2 and the price of brick jumped to \$18.00 per M. The man went out of brick-making and into the logging woods for \$20.00 a month that week to earn money enough to keep his family from starvation. The other fellow made the profit.

Good luck is like a good woman—she often loves the most careless and improvident man. Before the days of bracing kilns by means of logs and chains across the heads below the double sooving it was not an uncommon occurrence even in well-regulated yards to have the head of a kiln to fall down in the most interesting stage of the burning, and as a boy I used to enjoy the rush and scramble and the agony of the men set up against that blazing pile of red-hot clay to replace the fallen wall. Greater care was then taken in building heads and outside arches than is necessary now. But I knew one man whose kiln, even before the daubing was dry, had props and bracings at heads and outsides, above and below and in between, thicker than the leaves in Vallambrosa. No kiln ever yet went up on his yard without that forest of props, and yet it was his proud boast, though he didn't do much boasting, that he never had a kiln fall. And there again comes luck. William Burke, who has just gotten through, had finished a successful season. His brick had been well and cheaply made and the burns were simply ecstatic visions of terra cotta color. He had burned the last kiln and stood admiring it on the yard. It was a well put up kiln. "We have to cool this clay slowly," he said, "or the brick will check. Now, I must get some brick within three days or lose my contract, but it won't do to open the kiln for a week." Then the whole front of the kiln heaved as though moved by deep emotion and collapsed in a heap. The kiln had stripped itself most beautifully. It was folly to repair the wall and the outer brick were cool enough to handle next day. It was the best kiln of brick, Burke said, that he ever had. I wonder if that wasn't chance or did the kiln really understand.

But after all there are many cases of what you and I call luck that sometimes become plainly the result of the operation of a certain law. I knew a man who hadn't wit enough to lay the stringers of a bench and who was intellectually incapable of determining the relative values of wet hemlock and dry spruce as heat producers who made a reputation that has outlived the yard by a half hour's exhibition of his own witlessness. They had charged the kiln heavily with dry junk and by the evening of the second day the charging was going along in what would be called fine style now on some yards. In one of the arches was a huge dry oak junk and when it caught fire it made a great white glow in the juts above it. The charging around on either side was well worn out. The head burner was alarmed at the intensity of the heat in the oak junk and kept well-filled mouths, hoping to shut off the draft. Instead he increased the heat in the arch. At last he grew alarmed

and told his helpers that "that fool of a boss had raised h—l with the kiln by charging it with that oak junk." He allowed that there would be a hole melted up through that arch before half an hour. Saunders, the thick-witted wood wheeler with an ambition to burn brick, said "pshaw" contemptuously. "Well, pshaw and be d—d to you, old Saunders; you don't know anything, anyway." "I'll fix that arch in half an hour if you say so," said Saunders. "Go on then with your foolishness," said the burner, "you can't do any more damage than she's doing now." And Saunders got a pole and rooted that burning junk back and forth through the kiln. No wood was placed in the mouth during this time, and as a matter of course if the arch had been too hot before it gave ample time to cool and the danger was over. Saunders had no idea of saving the kiln by keeping wood from the mouths. He thought only of moving that big body of heat hither and yon; but he got credit for saving a kiln which would have saved itself, and for twenty years his advice was sought in burning. He became a head burner from that minute, and I have reason to believe that when he had completed his one hundred and fiftieth melt, which in those days went by the name of a burn, he knew actually 50 per cent. less about burning than he did when he began. But I beg to qualify my last statement. He never came within 50 per cent. of even knowing a simple nothing about burning, and yet when Saunders burnt, clinkers, and pale brick and wasted wood and labor were marked down against "hard luck," and of course it wasn't luck at all.

Yet I do believe in luck.

THADDEUS.

MANUFACTURE OF BRICKS NEAR DWELLINGS.

AN INJUNCTION AGAINST the manufacture of bricks near the complainant's dwelling was asked in the case of Ladd against the Granite State Brick Company, 37 Atlantic Reporter, 1041. The complaining party was a woman 66 years old, who had been for many years in delicate health, susceptible to irritation from atmospheric changes and "sensitive to any supposed invasion of her rights." The manufacture of bricks was on the company's own land, at about 70 rods from her house. The smoke or vapor carried to her house was not such in quantity or quality as to cause serious or perceptible injury to persons of ordinary health and temperament, but the complainant, in her enfeebled state and nervous condition, was troubled by it. It oppressed her breathing, causing her to cough more than usual, and had a tendency to bring out erysipelas, toward which she had a predisposition. Moreover, the foliage, or needles, on some white pines on the side next to the kilns had been turned to a reddish-brown color, indicating decay, though the trees had not been killed. Under these circumstances, and considering that the damage to the brick company would be large if they were restrained from a continuance of their business, the supreme court of New Hampshire holds that the desired injunction should not be granted. It thinks that the two maxims, "so use your own [right or property] as not to injure another's" and "he who uses his own right harms no one," are practically verbiage, as to a proper application of either a prior determination of the legal rights of the parties in their relation to each other is essential. Equal rights are often in conflict. While one may in general put his property to any use he pleases not in itself unlawful, his neighbor has the same right to the undisturbed enjoyment of his adjoining property. The right of each is qualified by that of the other. Limekilns, brickkilns, noisy workshops and various other establishments, useful and necessary, but productive of more or less annoyance and injury to neighboring proprietors, may be maintained in some places and not in others, although their injurious effect upon adjoining property and upon the personal comfort of those dwelling in the vicinity is in each case the same. The test is the reasonableness or unreasonableness of the business in question, under all the circumstances; a question of fact. The owner may put his land or other prop-

erty to any use not unlawful which, in view of his own interest and that of all persons affected by it, is a reasonable use, and for the consequence to others he is not responsible. So here it was held that the company's use of the land did not unreasonably interfere with or prejudice the complainant's rights.

THE "PERFECT" CLAY SCREEN.

In their advertisement on another page will be found an illustration of the "Perfect" Clay Screen patented by Elder & Dunlap, of Bloomington, Ill. The accompanying sketch gives a view of the under side of the screen, showing the action of the rotary brush while the screen plates are upside down. In this position the brush is sure to remove all particles of clay that may get wedged into the perforations or stick plates, thus keeping them clean all the time. This is a decided advantage,



they claim, and gives the screen great capacity. They will gladly give further particulars to any of our readers who will write them.

ADS CAN NOT BE COPYRIGHTED.

According to a decision of Judge Jenkins, of the United States Court of Appeals, advertisements intended solely for advertising purposes can not be copyrighted.

The case decided was that of the J. L. Mott Iron Works vs. James B. Clow, of Chicago. The concern first mentioned issued an elaborate catalogue of their wares, costing them many thousands of dollars for illustrating, printing, etc., and the Clow people issued a similar catalogue. Thereupon the J. S. Mott Iron Works sued for an injunction, asking that Clow be enjoined from sending out his catalogue, as the illustrations in many instances were the same as their own.

In handing down a decision in favor of Clow, Judge Jenkins says in his opinion:

"The statute provides that the words 'engravings,' 'cuts,' 'prints' shall be applied only to pictorial illustrations or works connected with fine arts, and no prints or labels designed to be used for any other article. To be entitled to a copyright the article must have by and of itself some value as a composition, at least to the extent of serving some purpose other than as a mere advertisement. The object of the provision was to promote the dissemination of learning by inducing intellectual labor in works which would promote the general knowledge in science and useful arts. It is not designated as a protection to trades in the particular manner in which they might shout their wares.

"So far as the decisions of the Supreme Court have gone we think they hold to the proposition that mere advertisements, whether by letter press or by picture, are not within the protection of the copyright law."

The man who has the reputation of being "a perfect brick," like any other brick, is likely sooner or later to go to the wall.

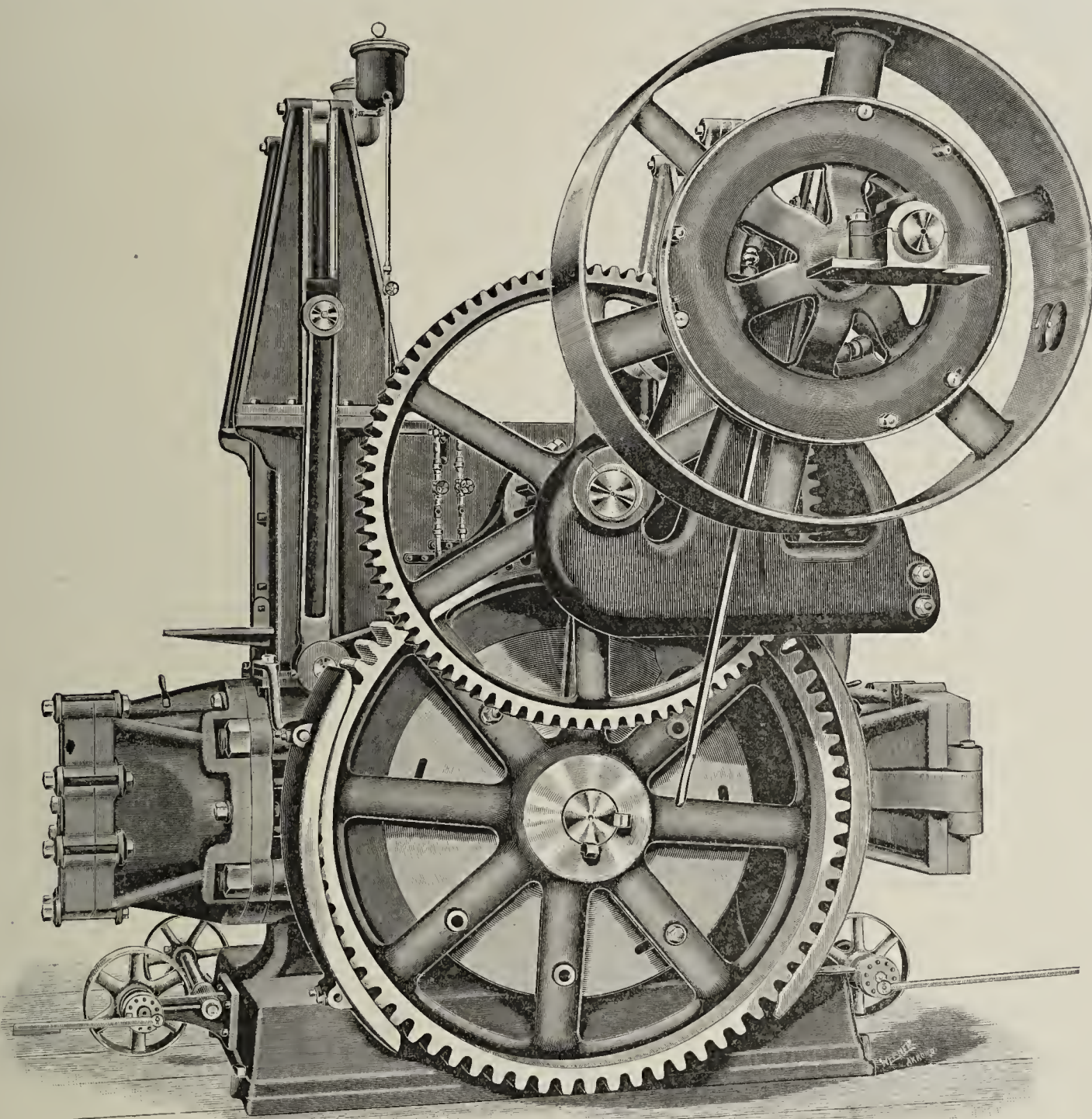
THE No. 25 PLUNGER MACHINE.

THE No. 25 Plunger Machine, just put on the market by the American Clayworking Machinery Company, of Bucyrus, Ohio, has been designed and constructed to meet the requirements of factories making fire-proofing, flue linings, building blocks, electrical conduits and other miscellaneous hollow ware in large quantities. It is equally well adapted to the manufacture of common brick and all products which can be economically produced by the stiff-clay process.

Geared machines possess several well-defined advantages over vertical steam presses. The capacity is uniform and not

of clay is effectually prevented. A rectangular extension is bolted to the clay cylinders. This extension is provided with a hinged die front which may be bushed to receive any desired size of die. The plungers are driven by a steel cam on the main shaft, working against the steel friction rollers.

This machine is a double plunger of large capacity, having a clay cylinder 22 inches in diameter and plungers with 15-inch stroke. Either or both clay cylinders may be operated at will. The prepared clay is discharged direct from pugmills or conveyors into the adjustable feeder, which discharges the pressing cylinder. This feeder is so arranged that the amount of clay can be varied to suit the character of the product being made. The shafting is of forged steel throughout. The friction pins are cast steel. The machine is back-g geared 42 to 1. It is supplied with friction clutch driving pulley 60 inches in



in any way dependent upon the skill of the operator. Also a much greater variety of small hollow ware can be conveniently and profitably produced. In the construction of this machine it has been the aim to obviate all difficulties which have heretofore arisen in the use of plunger machines. It is designed with sufficient surplus strength in all its parts to insure perfect freedom from breakage.

The cam, connections, friction rollers for plunger head and walking beams; the walking beams, connecting rods and cross heads to the force feed are steel. The clay cylinders are circular in form, 22 inches in diameter and fitted with renewable bushings. The plunger heads are provided with suitable air valves and are constructed with packing rings, so that leakage

diameter, 14-inch face. A speed of 126 revolutions per minute is recommended, which gives three plunges from each side of the machine per minute.

REMARKABLE RESULTS IN DRYING.

The following is a copy of a letter received by the American Blower Company, of Detroit, from R. C. Remmey & Son, of Philadelphia, which results in drying will doubtless seem almost incredible to many whose experience in that direction has been very costly. The American Blower Company evidently understand their business, at least so far as the drying of brick, tile and all clay products is concerned.

"Replying to your favor of the 4th inst., will say that we

are doing very satisfactory work with the dryer purchased from you. We are handling in the dryer special solid fire clay shapes as large as 36x36x12 inches, and although the material is of a refractory nature, we are drying these blocks without checking, in fine shape. To do such work it requires careful manipulation of the dryer, but as it is capable of such accurate regulation, we have no trouble in controlling the temperature, circulation and humidity just as we want it, and we believe we are doing work with our dryer which is not being accomplished with any other. It is needless to add that we are pleased in every way with it."

Written for the CLAY-WORKER.

BRICK VS. STEEL CONSTRUCTION.



RIENDSHIP! mysterious cement of the soul,

Sweet'ner of life, and solder of society!

I owe thee much.—Blair.

I invariably derive much pleasure and instruction from reading the contributions of my esteemed friend and brother,

R. B. Morrison. I very seldom feel called upon to take issue against him and never like to, but when I do he may rest assured it is under the presumption that he errs and will not object to a friendly attempt at setting him right, and I very cheerfully accord him the same privilege with myself.

I was very much amused with that judicious combination of flattery and sarcasm which appeared in the October issue of the Clay-Worker and think it well worthy of Brother M. It is neither large nor nauseous; neither does it leave an unpleasant bitterness after being taken. I am led to reflect, however, that my papers on Chemistry for Clayworkers, although written especially for the young and rising generation of clayworkers, were not even plain and clear enough for the well-stored and mature mind; that I was apt to plunge into dark chasms and depths, far ahead and clean out of sight of those whom I had undertaken to escort. For these unseemly "show-off" feats I must ask pardon of my readers in general and of Brother M. in particular, hoping they will charge them up to my enthusiasm and not to my vanity. I had no idea I was capable of such depths and profundity as ascribed to me by Brother M., and, notwithstanding the vigorous hoist he gives to my abilities, I still retain that inward consciousness of only having acquired an infinitesimal portion of the possibilities, and it seems to me highly probable that my defective method of imparting what I have been taught will fully account for the bewilderment of my dear friend, and yet he generously shoulders all the blame. Magnanimous soul.

—Nothing Absolutely Fire-Proof.—

If an ordinary puddling furnace were built of ordinary red building bricks it would be utterly destroyed before the temperature had been raised high enough to warrant the workman to charge in the iron. If we build the furnace of cast iron a portion of the interior would melt off in each heat until the outside was reached, which would suspend operations until new portions were put in to replace the melted-out portions. If wrought iron were used instead of cast iron the melting would be much slower, and if melting of this material were the only consideration the wrought-iron furnace would be a success. In this instance it is the melting point of the material that determines its fitness; but if we substitute another case, in which lack of expansion forms the chief factor, then the red brick would have a decided advantage over the other two; all three, however, soften and weaken when exposed to a high temperature; at a still higher temperature all three would melt and become as mobile and liquid as water; in this case the brick would be the first to melt, next the cast iron and last the wrought iron.

Now, in building matters I claim no more scientific expertness than Brother M. and have little more than experience and examples of past and present to guide me. Further, my point of view is neither from a brickyard nor a rolling mill; if I squint in any direction it is toward the brickyard. I can heartily respond "Amen" to his "brick walls for our houses and brickmakers for brick at all times." It might, however, be imprudent to urge the claim of red brick, or indeed any brick, in many instances, even with the indorsement of 100 per cent. of the brickmakers. The indorsements of builders and architects ought to receive some consideration.

—Occupying Valuable Space.—

The architect who would to-day insist on using bricks and

mortar only for the walls of an eighteen or twenty-story building would at once ruin his reputation and his business. When a building site costs from \$1,000 to \$2,000 per square foot the owner is very chary about wasting such valuable space, hence the recourse of the architect to iron or steel to aid him in securing very nearly as much space on the ground floor as on the upper floors. Just imagine the thickness of walls necessary for a thirty-six-story building. I have no rule by me at present governing the thickness of walls, only for chimneys; they—according to the rule—if more than five feet inside diameter, should be 13-inch walls at top and increase 4½ inches in thickness for each twenty-five feet of descent. Assuming, then, the stories of the building referred to above will average a height of fourteen feet, including the thickness of each floor, the building would be over 500 feet high, and taking the rule for chimneys as a guide the walls on the first floor would be 98 inches thick; the inside walls would necessarily be the same thickness. Comparing this with thickness of walls, I have in mind, viz.: The Times Building, on Sansom street, this city, and the filter house at the Franklin Sugar Refinery, both brick buildings, the former five stories high, the latter eight stories, with first floor walls 49 inches and 33 inches thick respectively. The filter house walls in top story are 18 inches and each story down the walls increase in thickness by 4½ inches. Computing the thickness of the walls in the New York building by this example we should have to inclose the rooms on the first floor with walls 175 inches, or 14 feet 7 inches, thick. Under either rule I agree with both my friends, R. B. M. and A. N. Oldtimer, it would be a veritable picnic for Hackensack and Haverstraw brickmakers. Why, if the building were only 100 feet by 100 feet and there were only two inside walls, the first course on the ground floor would require nearly 30,000 bricks! And if this story was 18 feet high it would require, allowing one third for openings, 1,800,000 bricks! I have been much assisted in these computations by Table 1 by Prof. Ira O. Baker, published in the October number of the Clay-Worker. I should feel supremely happy if I could send this 1,800,000 order to Brother A. N. O. as a first installment of what was needed to complete the building, with the balance of order to follow and duplicate the same to Brother M., but, alas! alas! old-fashioned architects who favored massive brick walls are being thrust aside by death and the rising generation of architects whose education embraces more engineering than was formerly considered necessary in that line. These men look with disfavor on massive masonry, besides they see the height of buildings rapidly approaching that point where the brick structure will not support its own weight. It is a very easy matter to find the crushing strain on the bottom course of a brick building like a tower or chimney, that only has its own weight to support, and to arrive at the weight on each outside brick in the bottom course of a perpendicular wall you need only count the courses and multiply by the weight of a brick; for example, in a building 500 feet high there would be about 2,750 courses; this multiplied by the weight of a brick, say five pounds, would give us 13,750 pounds, or 6½ tons. This, mind you, is only for bare walls, the roof, with all its accessories, the floors, with all the furniture, etc., on them, furnish much additional weight. Now, if my memory serves me right, it is on record that the St. Rollix Chemical Company, of Glasgow, Scotland, intended building their famous chimney 500 feet high, but changed their purpose on finding some of the lower bricks showing signs of failure to stand the crushing strain; they might be soft bricks; I cannot say; but I think seven or eight tons on each individual brick on the bottom is far beyond the factor of safety. Professor Baker could no doubt give us lots of information on this subject. I trust he will. So far I have offered no defense of the fire-proof qualities of the shrouded skeleton, and before doing so would just say that a good brick building, not subject to a prolonged and intense heat inside, generally escapes with little damage, but where it is subjected to such a heat the walls are generally ruined even if they do not fall. I recall two such examples that recently occurred in this city, the late fire at 13th and Market streets and the Hazeltine Building, on Chestnut street. I could recall scores of others. I can also recall many that only needed the wood-work renewing, that stood the fire nobly, like the one-story warehouse cited by Brother M.

—Strong, Light and Airy.—

In endeavoring to advance the interest in brick, there appears to me no necessity to unduly rail against the merits of other material used in building construction. Brother M. speaks derisively of the steel frame work as a "grinning skeleton," "a wolf in sheep's clothing," etc., and denies the steel or iron of which it is composed the fire-proof qualities he accords to building brick, and this he maintains is "absolutely fire-proof," "for the simple reason that the material had been

burned before it went into the building, hence could not be destroyed by heat." What ground Brother M. has for such an assertion I do not perceive. My investigations of heat, so far, have led me to the conclusion stated above, "nothing absolutely fire-proof." If Brother M. wishes to convince himself of this respecting building brick, or if he wishes a comparison of brick with iron, let him select a small piece from his scrap heap—an old horse shoe will do—and take this and one of his bricks to a heating furnace in a rolling mill and for the price of a glass of beer—maybe less—the heater will in a few minutes convince him that the iron will retain its form and properties long after the brick has been converted into liquid slag. I am quite aware that clay goods expand less than iron, but I am sure my friend is aware that this expansion can be counteracted and reduced to the minimum very easily, even when it is bolted together; he has, no doubt, noticed the elongated bolt holes in the ends of railway bars and in the splice bars for making the joint; add to this all the precautions that will be used to prevent any great rise in temperature, the automatic sprinklers, etc., also the fact that there is no combustible in the building except office furniture and equipments. The automatic sprinklers can be arranged to meet all outside contingencies.

I agree with Brother Randall and with many more, steel frames are right in principle and are no menace to the brickyard; measure up the space occupied by the steel frame and see how much clay goods will fill it; then measure up the space it enables you to fill in with clay goods in the floors; the "few pitiful thousands of brick in the building" is by no means a quantity to be despised after all. True, the covering of terra cotta or clay goods does protect the "grinning skeleton" from the ravages of time and of ordinary fires, besides adorning its uncouth-looking frame and of course hiding "its true character," that of immense strength in a small compass. Examine the light and airy rooms of our eighteen and twenty story buildings and who would not shudder at the idea of those flimsy-looking walls and corners supporting an apparent ponderous superstructure, not knowing, of course, of the "hidden skeleton" embracing and supporting the beautiful clothing of brick and terra cotta work.

—Lumber Being Ousted, not Brick.—

If anybody ought to complain on the score of being knocked out of business it is the lumbermen; brick and iron have combined to banish from our buildings the wooden joists, flooring, studding, rafters, shingles, clapboard, etc. Very little wood finds its way into our tall buildings now; it is doomed and very justly, too; its combustibility and weakness are fatal to it. Iron, on the contrary, is strong and incombustible and so essential a factor in tall buildings that if four inches of clay easing is not sufficient to shield it from fire and frost, why, use six, eight or ten inches and we should still have buildings strong, light and airy.

In defending iron or steel I have no desire to underrate brick. In fact, I am as much delighted with good, clean brick and terra cotta buildings as Brother M., and quite agree with him that they have stood the test of time in a remarkable degree—if, yes, "if," that is, if they are put together properly and cemented with good mortar.

Let brickmakers do all they reasonably can to advance the claims of good brick, but they may rest assured the man who owns a lot worth \$1,000 per square foot will object to covering 30 per cent. of his floor space with massive brick walls if he sees a safe way to do it with 5 per cent. I venture to assert that Brother M. and the 99 per cent. who indorse his tirades against steel structures would do the same thing, much as they now are in love with massive brickwork.

Brother M. ought to join me in attacking the pernicious system of putting in studding and lathing partition walls; also in a plea for fire-proof floors and roofs for ordinary houses. Here he could call in iron or steel to help him again.

WM. WAPLINGTON.

PACIFIC COAST NEWS.

THE BRICK AND TERRA COTTA dealers are experiencing a very quiet season, and the prospects are that this program will remain in effect for some time to come. A dearth in building is probably responsible for the fact that this trade does not seem to march forward towards prosperity as rapidly as other lines.

The quality of the brick made by the Denny Clay Company at Seattle, Wash., and which is to be used on the streets of Spokane for paving, is being inspected by Spokane city officials. A contract for paving three blocks on Howard street,

Spokane, has been let, and the contractors will purchase about 5,000,000 brick from the Denny Company. It is the intention to pave three blocks this fall, and if it successfully stands the test of the winter's use, about a mile altogether will be paved with the brick.

Bisbee, Ariz., is now burning brick for itself. Up to this time brick for Bisbee came from Tucson, Ariz.

Manager A. J. Voight, of the Montana Fire and Vitified Brick Company, at Armington, Mont., recently forwarded samples of the brick of the company to different places throughout the country to have them thoroughly tested. He has now received returns from the B. & M. smelter at Great Falls, Mont., where the Benzette brick of Pittsburg, the St. Louis, the Montana and brick from other noted manufactories were tested. All the samples were subjected to the same test, and at the end it was found that the Montana brick was superior to the other samples, in that it did not corrode, being as clean as when it was put into the furnace, while the other brick was corroded more or less. Non-corrosive is one of the strong points in favor of fire brick, but until the arrival of the Montana article none had been found which would stand the test, the Benzette brick coming the nearest to perfection.

Work has begun at the Stockton, Cal., Art Pottery Works, putting in the new dry pan which is to take the place of the old one. The space occupied by the old pan is wanted for the new kiln which is to be built, but it cannot be taken out of the way until another is built in its place. As soon as the new pan is completed and the old one torn down, work on the new kiln will be commenced.

SUNSET.

THE DECATUR CONVENTION.

Program of the Twentieth Yearly Meeting of the Illinois Clayworkers' Association.

THE COMING CONVENTION of brick and tile men to be held at Decatur, Wednesday and Thursday, January 5 and 6, 1898, bids fair to be one of the most successful in the history of that body. Mr. G. C. Stoll, the energetic Secretary, sends the following list of papers already provided for, and states that other interesting numbers will be added and the complete program announced in our next issue:

—Wednesday, January 5th, 10:30 a. m.—

Enrollment of members. Reports of members. Report of Secretary. Adjournment.

—Afternoon Session.—

Address of welcome, by Hon. Benjamin Taylor, Mayor of Decatur.

Annual address by the President, W. S. Purington, Galesburg.

A paper—"Burned Clay for Road Purposes," by F. Plumb, Streator. Discussion.

Address—"Tile Drainage as an Investment," J. J. Billingsley, Indianapolis, Ind. Discussion.

Essay—"New and Old Brickmaking," William Ammann, Decatur, Ill. Discussion.

Address—"The Dividends," W. D. Gates, Chicago, Ill. Discussion.

Appointing Committee on Resolutions. Adjournment.

—Wednesday, 6:30 p. m.—

Annual banquet, given by the Decatur brick manufacturers.

—Thursday Forenoon, January 6th,—

Will be devoted to visiting various brick industries and places of interest, the Convention being in charge of the Committee of Arrangements: Albert Ammann, Sherry Tuttle and Davis Brown.

—Thursday Forenoon, January 6th—

Essay—"The Advantages of Large Tile Drains—How to Lay Them," S. C. Cowgill, Summitville, Ind. Discussion.

Address—"Hollow Blocks, Their Advantages," Wm. Griffin, Griffin, Ill.

Essay—"The Value of Conventions," J. H. Lambert, St. Marys.

Address—"The Tribulations of a Brickmaker," Dr. A. L. Converse, Springfield.

A poem—"The Tilemaker's Dream," D. O. Loy, Atkinson.

Report of Treasurer. Report of Committee on Resolutions. Election of officers.

Headquarters will be at the St. Nicholas Hotel.

W. S. PURINGTON, President, Galesburg, Ill.

G. C. STOLL, Secretary, Grant Park, Ill.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Quick Work—A Good Word for Decatur.

Editor Clay-Worker:

I am out among the Suckers, making tile and brick at Latham, a small town about sixteen miles from Decatur, for D. T. Torrence. Prosperity has surely struck this section, for we are selling all the tile we can make. We commenced May 15th and have been running steady ever since, making principally twelve-inch tile, and from now on will make fifteen-inch. We made several fine kilns of brick, one of which we made, dried and burned in five and a half days.

Our factory is two-story brick, 40 by 138 feet; machine room is 24 by 70 feet, two stories, and steam pipes under drying shed, and the best clay, I think, I ever worked in. We are using "Leader" machinery, made at Decatur. We now haul our clay in carts, but will probably put in cars next season. We burn our tile in "Decatur" down-draft kilns.

I am glad that the Illinois Association of Clayworkers is to meet at Decatur this winter. It will be handy for us here, and for a great many other brick and tile men, for you know Decatur is almost the exact center of the State, so there ought to be a good big crowd there. Decatur is a lively little city, and all who go will have a good time there the week of the Convention. Those of us who can't take in the National Convention ought to try and go to the State meetings.

Enclosed please find \$2 for one year's subscription to the Clay-Worker for D. T. Torrence. Respectfully,
November 5, 1897. C. W. NORTHRUP.

Treasurer Sibley Reports Progress.

My Dear Randall—The "Official Report" of the Eleventh Annual Convention duly received. Would have acknowledged it sooner, but have been so rushed with work this summer that my personal correspondence has been neglected. Am now building a large Eudaly kiln to meet our increasing demands for the celebrated "Coaldale Paving Block."

But the old saying is, "There is an end to all good as well as bad things," so first we had an epidemic of smallpox at Birmingham and Montgomery, and more recently "yellow jack" has appeared and simply paralyzed all business in this section. The cities in which we have large work are so frightened that no excavation will be permitted until after frost, and this, together with an unprecedented drought, resulting in our creek going almost dry, has completely shut up our paving department until kind Providence opens up the way again. "It is an ill wind that blows nobody good," so we hope next season to reap a rich benefit from "yellow jack's" visit, as all the stricken cities will at once push permanent paving with all rapidity. There are several large contracts to be let as soon as cold weather begins.

We have built a new Eudaly down-draft kiln and changed the others to his system, and have obtained the most superb burns from same I ever saw. Owing to having to use so much sand with our pavers, we could not put in perforated bottom kilns, but Eudaly adapted his system of flues to solid bottom to meet this, and we obtained No. 1 vitrified brick on the second course over solid bottom, and over the flues, where the sand could not pile up half the size of bottom brick, it was vitrified right to the bottom. The cooling and annealing in his kiln is most expeditious, and the brick are void of brittleness. The saving in fuel over the other kilns was fully 35 per cent. Altogether, we are more than pleased with the results, and Eudaly has a standing advertisement at Coaldale for his kiln.

I am delighted with the appearance of the Convention Report, and think that, as usual, it reflects great credit upon all concerned. The preservation in this form of Prof. Orton's

most excellent report on Standard Tests of Paving Brick will be invaluable to the craft, and forms a nucleus for a paving-brick library. Truly, the fruits of our grand organization are becoming manifest.

I am glad to note that the Pittsburg brethren have given us an invitation to meet next with them, and the genial, whole-souled, up-to-date delegations they have sent to our past gatherings is an earnest of the good time we will have with them. It is therefore with pleasure that I vote to accept their hospitable invitation, and I know all will be glad to get a sight of our old friend, the "four-year-old," who has not been with us in recent meetings. The other cities that have invited us have my heartiest thanks, and I sincerely trust that in succeeding years we may have the privilege of convening in each one of them. February will no doubt be the most convenient and enjoyable time for all to come.

I am just back from a round trip to Augusta, Ga., where Mrs. Sibley and Hettie are visiting "the old folks at home" and can't come back to Alabama till after frost, on account of the rigid quarantine and fumigation of baggage. All are well and send kindest regards to you and yours. I shall bring them both to the Pittsburg Convention. With best wishes,

Yours sincerely,

JOHN W. SIBLEY,
Treasurer N. B. M. A.

The Situation in Chicago—Better Prices Prevail.

Editor Clay-Worker:

The business situation in Chicago, as well as in the country generally, is not all that the over-sanguine expected it to be. Those who were made over-hopeful by the unexpected improvement that began with so much energy two or three months ago have now been overtaken by the realization that there has been a slight reaction, the effect being to dampen their spirits. This reaction was in accord with the expectations of the more conservative part of the business community. It is not of a serious nature, however, and while it is true that capital is still held rather closely from investment in new enterprises, there has been a great deal placed in the hands of old and well-established industries.

The investments in real estate and building are still small by comparison with what they are under normal conditions, but, as has always been the case in times of depression, real estate is among the last to feel a revival in business.

The earnings of the railroads seem to be keeping up in a very gratifying manner, and are, perhaps, the best index possible of the prosperity of the people. Many industries are taxed to their full capacity, and some are unable to fill their orders. A very large percentage of wage-earners are busy, and prosperity is still in possession and growing.

The brick manufacturers of Chicago are now feeling better than has been their habit for many moons. Without the aid of any pools or business association or combination of any kind, the price of common brick has gone up about \$1 per thousand, and they are now selling at \$4.50 to \$5, delivered.

The building record for October shows a slight increase over the preceding month, and a very large increase over that of October, 1896. During October of this year permits were issued for the construction of 348 buildings, extending over 12,101 feet of frontage, and to cost \$1,543,570, being an increase over the month of September of 38 buildings, 704 feet frontage, and \$77,220 in cost, and an increase over the corresponding month of last year of 221 buildings, 3,272 feet of frontage, and \$762,995 in cost.

Dealers in building material are all feeling the effect of the increase, and some have made the best month of the year in the amount of sales.

It is reasonably certain that in the near future a large office building will be built on the site of the present Oriental Building, 120 to 124 LaSalle street.

A visit among the architects brings out the fact that there are many new plans upon their boards nearing completion, and all the indications show that there will be a fair amount of building going on during the coming winter months.

Chicago, November 10, 1897.

TEMPERED CLAY.

Cold Spots—A Secret Remedy.

Editor Clay-Worker:

My attention was called to a copy of the Clay-Worker by a friend of mine, who has had some fifteen years experience in brick making, and he tells me that in burning brick considerable trouble is had at times with what is called cold spots, or places where brick will not burn. This gentleman tells me

that he has discovered a secret by which he can control and immediately remove these cold spots without stopping or changing the fires and save the entire kiln. I said to him that I had no knowledge of the brick business, but had no doubt that his secret would be of great value if he would but demonstrate the fact by actual trial before brick men. This he said he felt able to do and would be glad to make satisfactory and practical tests of his skill. This gentleman desired me to correspond with some leading brick men for him, soliciting their opinion upon the subject. He is honest, industrious and reliable, and will be glad to correspond with any of your readers who are troubled with "cold spots." JOHN A. WEST.

Isadore, Mo.

Looking After Foreign Markets.

Editor Clay-Worker:

Nearly all this season one of our "down-town" brickmakers has been pouring his brick into West Philadelphia right on the door-steps, figuratively speaking, of our home brickyards, which have been piling in stock right along. Now this down-town yard is hauling this portion of its product about five miles. My first impression was that one of our home yards required assistance in filling an urgent order, but that did not correspond with other circumstances. I therefore examined the bricks to see if they were something in a special line, but found them only common bricks, yes, common enough, so without making myself appear unduly inquisitive over this matter I came to the conclusion that our down-town brother has either got a customer whom our home manufacturers are giving a wide berth, or he is endeavoring to place his goods in a foreign market, anticipating his share in the demand of future seasons, or, taking a more charitable view, he may be compelled to sell; if so I pity him. It is safe to conclude that when our home manufacturers can not get the price of a suit of clothes out of an \$800 contract, with a haul of only one-third of a mile, there is precious little in it for one who must haul five miles. This and similar doubtful moves lead me to question the policy of invading foreign markets, especially those already overcrowded. I am fully aware I am inviting ridicule and contemptuous pity from sharp, energetic, snappy business men, who look upon every inch of this planet as their legitimate market, without the slightest consideration of its condition. Legally this may be right, morally it is far from it, and unbecoming in any one aspiring to straight and square manliness. Business is now so overburdened with chicanery that to attempt it in its pure and simple way is folly, and will surely result in dire disaster. To push a brother out of the market and capture his customers redounds to a commercial man's credit and ability. I have just picked up on my porch a miserably printed and smeared "dodger," announcing extraordinary cheap groceries and premiums of china tete a tete sets, etc., with 1 pound of tea or coffee, also a long list of various articles, many of which are below the wholesale price quoted in to-day's paper. This benevolent grocer has twenty-eight good sized groceries in New York and Brooklyn, and has already planted three in Philadelphia. Now, isn't he smart? Isn't he generous? How unkind it would be to pronounce, or even hint that he is a sordid, selfish counterfeit; such a god-send for poor, needy people; such nice useful premiums, too, for hungry people, "a pink china tete a tete set which could not be bought for less than 75c," with 1 pound of tea at 60c! Just think of it, "1/4 pound New England ham, 2c;" but mark what he says besides: "Our stores are not to be compared with others," and that "our up-to-date business methods stand pre-eminently alone." I hope so, yet I am afraid not. I have long ago observed others practicing those "up-to-date business methods," in other branches as well as groceries. Does Smith invade a foreign market for the sole benefit of the foreign buyer and consumer? Not he, indeed; his sole concern and single care is for Smith. To invade an overflowing market appears to me not one whit better in principle than entering your neighbor's potato patch and helping yourself to his produce, or to make a better parallel, to allow him—your neighbor—to prepare the ground and then you step in and plant as much of it as you can, all of it if possible, shouldering him out completely. Observe, too, the sneaking methods to get a foothold, how they misrepresent their goods, how they try to bluff you with their prices and prizes. If you ask them for the cheap goods named on the "dodgers" sent around once or twice a week, they candidly tell you in a soft, pleasant and confiding tone, "you don't want any of that stuff. The best fancy Elgin creamery butter at 18c is not for you at all, mam; the genuine article, mam, is 23c; this we guarantee, mam." Now, is this candor? Not a bit of it; only bluff and taffy of another color.

I am really proud of being under the impression that few,

very few of our clayworkers have sunk so low in chicanery as the majority of other tradesmen. I hear of little meannesses cropping out here and there, and I am not a little grieved when a tricky member is applauded for his baseness, which they call "sharpness." Some of the traveling salesmen for clayworking machinery can furnish you with some fine examples of this sharp business, where heavy loads of whiskey and glib licentious gab did the business. To me, the moral outlook of business is not pleasing; it appears to be drifting toward a whirlpool of trickery and selfishness. The American manufacturer is bursting with a desire to enter European and other markets, but implores his government to keep everybody out of his market, and to a great extent it is pandering to his unreasonable and selfish appeal.

The brickyards of this city are nicely distributed thus, the uptown, downtown and West Philadelphia yards. At the commencement of the season a schedule of prices was agreed upon. How faithfully this has been observed I can not say, but several weeks ago a very prominent and large manufacturer commenced advertising bricks at a reduced rate. There ought to be enough manliness in our Quaker City brickmakers to arrange and maintain reasonable prices, also to distribute the patronage. I am not setting this forth as something new; I am also aware that it has been proposed, tried and failed, though not because it is impossible through inherent defects, but from the sordidness of individuals who ought to support it and one another, instead of cutting and slashing to support the master-builder.

HYDRO-CARBON.

Philadelphia, Oct. 9, 1897.

A Klondike at Home.

Editor Clay-Worker:

Permit me to call the attention of your readers to a Klondike in a civilized country, and free from the rigorous cold of the Arctic circle. "Klondike" may be regarded as standing for a place where great wealth may be taken out of the ground. Any party can obtain the wealth by engaging in the manufacture of paving brick in a part of the country that is free from competition for a distance of nearly four hundred miles in all directions. It is well known to many that good paving brick cannot be made from common brick clay, however good it may be. The material must be largely a "shale." The material we refer to has been tested at three plants in Ohio and one in Illinois, and by all pronounced first class. A part of one of the brick was sent to the U. S. Testing Department of the United States Arsenal at Watertown, Mass. Major Reilly, commanding, certifies this brick stood a crushing strain of 721,000 pounds, equal to 31,945 pounds to the square inch. This city, Minneapolis, Minn., has just commenced to use paving brick for street paving, and has used this season over 1,200,000, and the popular sentiment seems to be strongly in favor of brick for paving. The city engineer has recommended to the City Council that at least 203,000 square yards should be paved during 1898, and this would only be a beginning, as miles on miles of streets need paving. The above number of square yards would require about 11,500,000 brick. The difference in the amount of freight on the above brick if freighted from Galesburg or Des Moines, as compared with the freight on the same number of brick from our shale bank, would be over \$50,000, and this for one year only. This city is only one of more than a dozen of other cities that need paving brick and are within easy shipping distance of our property. The property consists of seventy-seven acres, connected by spur track with two of the best railroads in the Northwest. This gives ample shipping facilities, north, south, east and west. The improvements are three tenant houses, a brick barn, an engine and boiler house, and machine and clay house, three eighty-horse power boiler engines, shafting, etc. Three kilns, good for nothing for making paving brick, except to use the brick in the kiln walls for building down-draft kilns. The property offers unprecedented advantages to any who will engage in the manufacture of paving and fine front brick. The material for the latter is on the surface, and the shale under this. As the greatest part of the expense for appliances to make paving and pressed brick consists in the indispensable down-draft kilns, suitable for burning paving brick, they are also just the thing for dry clay, pressed or front brick. Hence, here is a double Klondike, viz., making paving brick in summer and dry clay pressed brick in the winter. Practical minds will see at a glance this will enable one to make pressed brick at a cost that will defy competition, as the only outlay would be for a dry-clay brick machine. All else would be provided for in the paving brick outfit, and the cost of labor and fuel the only cost on this part of the work, as the officers, engineers, fireman, etc., usually paid by the year, would be a

necessary expense in the manufacture of paving brick, and the manufacturer of pressed brick would divide the load. This property is for sale at a great bargain, as the present owners have not the capital needed to change the plant to one for making paving brick.

J. K. CALDWELL.
Minneapolis.

Small Country Brick Yards.

Editor Clay-Worker:

I am in receipt of the current number of the Clay-Worker and find it full of useful information for those more pretentious brickmakers who run large plants and infest the large cities. Small towns and hamlets are represented by a large class of the craft, who take the clay from the bank with horse and cart, dump it into a pit that will hold a day's moulding (about 5,000); wet the night before. In the morning, with temperer in the pit and the molder in the hole, two boys to off-bear on a yard 90x150 feet, the day's work begins. The mud is shoveled into a mud mill, a horse puts machinery in motion, the brick is layed out to dry, to be edged and set in kiln next day. This is the old process, three or three and a quarter brick benches twelve high to the crown, five teeth brick, with fourteen to sixteen inch arches, brick above are set three over three to the top. Kiln 32 to 34 brick high. The usual size for four burners is 100,000, or eight arches. Sometimes twenty arches, requiring four burners on a watch. The kiln is eased on heads with eight-inch walls to within ten courses of top; four inches above sides a four inch casing, with fifteen inch embankment of clay reaching to within ten courses of top. When all is completed fires are started in all the arches. Water smoking slow at first, gradually increasing till fires meet in center of kiln. The fires are increased to white heat in arches, after water smoking is clear till it appears at top of kiln; then one head is closed and draft established on head and center till a settle is started; then the dirting process till settles are deep enough to suit; then change. Repeat the process on the other head till done. It takes three days to water smoke and from five to six days to burn. Let the kiln cool slowly and then they are ready for market. We burn with wood. It takes from five to six cords to the arch. Wood costs from \$1.25 to \$2.00 per cord.

Brick produced in this way can be sold for \$5 per thousand, making to the producer a net profit. A well-conditioned plant can make and sell 400,000 in a season. Between frosts you can scarcely get out of smelling distance of burning brick. All over central Illinois during this period the smaller towns are producing millions of fine building brick in this way, furnishing thousands of men and boys employment, converting the earth into fireproof and frostproof material for walling wells, cellars, cisterns and beautiful dwelling and business houses, to say nothing of the large quantities used for arches on roads and bridges and country school houses. Bro. J. W. Crary's sensible talks were a wonderful inspiration to us of the primitive craft and his methods were adopted by many of our boys. We use iron doors and frames, also moulds furnished by D. J. C. Arnold, New London, Ohio, whose advertisement appears in your journal.

A SUBSCRIBER.
Summum, Ill.

The Boom in Building Operations.

Editor Clay-Worker:

Being a close reader of your journal, and much interested in the letters from time to time published, I have ventured to send you an item or two that will, I think, interest others as much as they have interested me.

A brickmaker's interest is naturally in a heavy demand for brick, and, as far as business is concerned, it is his chief interest. Personally I go the whole ticket with Brother Morrison, and reiterate his toast, "Brick walls for our houses, and brickmakers for brick, at all times." The two articles by our ex-President in April and May numbers of the Clay-Worker suited me very well, and I felt like doing my share toward boosting iron and steel clean out of buildings. Such feelings come quite natural and easy, but it is not the proper course at all times to act on the spur and impulse of the moment, for on calmer consideration of the subject I feel like letting it stay in, because public sentiment orders are "hands off." So, without bothering my head about its merits or demerits, my thoughts wandered off in another direction, but still after something for the brick interest. I picked up my morning paper and my eye soon caught "Statistics of the Bureau of Building," and I began to feel more at ease. I found that October was the banner month, and quite a surprise, both in the quantity and quality of new building work begun; that it exceeded September by nearly \$200,000, and was over \$1,000,000 ahead of October last

year; and it affords me no small gratification to find that our ward—the Thirty-fourth—was down for \$775,800 of the \$2,188,895, or total of the whole city—considerably over one-third!

Now for good brick sales, and running all winter, if we had dryers; but out of eight yards in West Philadelphia only two have dryers, and here, right in the fall, permits have been given for 366 buildings, to cost over \$2,100 each. I was also much pleased, in thinking over this boom in building, that not one of these 366, nor of the 500 or more that have been built in this ward quite recently, are of the steel frame type; they are to a unit all solid brick structures, with the exception of heads and sills for doors and windows. It is only the "sky-scrapers" that use the steel frames and use so few of our brick. I was under the same impression as Brother M. I thought these sky-scrapers were little or no good to the brickyard, yet I have it on very good authority that 4,500,000 are going into our latest sixteen-story acquisition, on the corner of Broad and Chestnut streets.

—Not so Bad, After All.—

While I was writing this letter my son put into my hands a small pamphlet he got in New York, giving some statistics of the Pulitzer Building, a few of which I send you. Its extreme height is 375½ feet; it contains 26 floors on 22 stories; it contains enough brick to build 250 ordinary houses, and weighs 34,000 net tons. Its thickest wall is 12 feet through; its iron skeleton would support the building if the walls were taken away, and it contains enough iron to build 29 miles of railway! Talk of food for thought!

This nearly knocked my ideas into smithereens, but I gathered them together, and it is only right that I should say I am indebted to Brother M. for the few thoughts below—that is, by thinking over his articles, pro and con, I was led up to them.

Firstly, "partition walls of brick" arrested my attention, and I viewed this proposition from various points of view, but always in connection with the ordinary dwelling-house. Secondly, my attention was led from partition walls to floors and ceilings of such dwellings. I thought if this iron skeleton has come to stay with us—and, Mr. Editor, I share your opinion that it has—we had better try to utilize it. Cannot we do this by advocating fire-proofing for floors and ceilings? If iron scrimps us in the outer walls, it is open to assist on the inside.

I have made a rough calculation on the 366 buildings mentioned above, based on the flooring, ceiling and lath and plaster partitions in my own house, and find that if the studs and laths were replaced by four-inch brickwork, the floors and ceilings by eight-inch fire-proofing, supported, of course, by I-beams, it would require the equivalent of 14¾ millions of brick, or a good year's work for a decent-sized brickyard.

A STRETCHER.

Ohio Valley News.

THE DEMAND for clay products continues to be great, and all the works in this region are running to their full capacity. A car famine exists, and shipments are being greatly delayed. The long coal strike being settled, a great many of the cars are being used for coal shipments to the lakes before navigation closes. This scarcity of cars is a source of great annoyance, and may result in considerable loss to the brick and sewer pipe men, for unless they soon get their orders filled the weather will be such as to prevent sewer work and paving. The yards are all piled full of their products, sold and awaiting shipment.

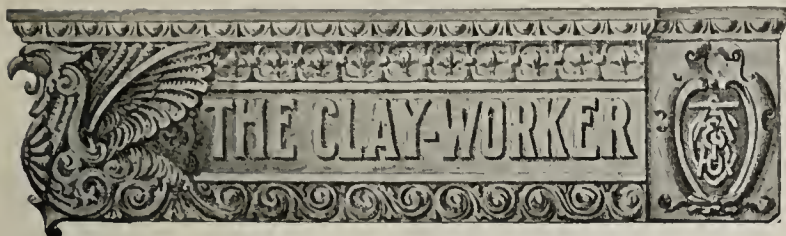
On September 27th there was a meeting of the bondholders of the Royal Clay Manufacturing Company in Wheeling. The meeting was called for the purpose of hearing the particulars of a plan for consolidation of this concern, located at Ulrichsville, with other Ohio sewer pipe manufacturers. The plan was presented to the bondholders by Theodore Wentz, cashier of the First National Bank of Canal Dover, and involves the resumption of work at the Royal plant. The matter was taken under advisement by the bondholders, and it is possible that it will be accepted, though no action has yet been taken.

The Pittsburg capitalists who hold a controlling interest in the Chelsea Pottery at New Cumberland, W. Va., which has been for three years idle, will soon place the plant in operation. They have the plant, can make money now, and less than \$500 would be required to make repairs.

A. O. Jones, President of the A. O. Jones Brick and Terra Cotta Company, of Zanesville, has filed a deed of assignment to Hon. F. H. Southard. His works were recently burned. Assets about \$30,000; liabilities the same.

A meeting of the sewer pipe manufacturers of the United States was held in Pittsburg, October 21st, for the purpose of forming a combination. They adjourned until a future date, when the combination will unquestionably be formed.

BUCKEYE.



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clay working Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

XXVIII.

NOVEMBER 1897.

No 5.

CURRENT COMMENT.

Slowly but surely the commercial atmosphere is clearing. The pendulum is swinging back from depression to prosperity. The movement is as certain as time itself. Let grumbling cease. Let us be thankful

An interesting program is being prepared for the Illinois clayworkers by Secretary Stoll, as the readers may see by preliminary announcement on page 373. The full program will be given in our next issue.

The tender of the keys to the twin cities of Pittsburg and Allegheny to the members of the N. B. M. A., as recorded on a preceding page, is a very large straw that tells of a cordial welcome and a thorough good time to all who attend our next National Convention.

Our New Jersey correspondent writes that, owing to the fact that he has recently taken unto himself a help-mate, he has not had time to prepare his monthly contribution. However, he does take time to tell us that while the terra cotta works in Perth Amboy and vicinity are not as busy as they might be, the fire-proofing men are running full-handed, as usual, filling orders.

In all quarters the price of brick during the past year has been unnecessarily low. If we read the signs of the times aright, there must be an increase in price. On general principles, it would appear that there will be a greater demand for brick at better prices than have ruled the past season. Already an improvement is noted at Chicago, New York and other points, as reported by our correspondents. It is to be hoped the movement will spread rapidly.

J. W. Robb, Manager of the Clinton (Ind.) Paving and Building Brick Company, looked in on us the 10th inst. He

reports the paving brick business as very active, and predicts that '98 will prove the most prosperous year that this line of trade has ever known. The Clinton works are running up to their full capacity, and expect to continue right through the winter. They are now making a block 3 $\frac{3}{8}$ by 9 $\frac{1}{4}$ inches, and find that they burn as easy and anneal even better than the smaller brick.

Our good neighbor, J. R. Elder, President of the Indiana Clay Shingle Manufacturing Company, recently made an extended trip East, and expresses the belief that we are surely on the eve of another era of great prosperity. He is a close observer and a man of good judgment, as evidenced by his success in life, never having failed in any undertaking, which is saying a good deal, for he is a man of affairs. He has great faith in the future of tile roofing, and predicts that it will soon come into general use throughout the United States. Certainly it ought to, for it is unquestionably the best of all roofing materials.

Mr. Elder relates an incident that came to his notice which has a deep significance, and illustrates the unreasonable trade conditions which prevail in the sewer pipe business, and many other lines as well. He called on an Eastern friend, the proprietor of a large sewer pipe factory, who, in reply to the query, "How's trade?" said: "There's quite a large demand for pipe, but we are not running our factory, for we can buy of Western manufacturers cheaper than we can make the pipe ourselves. The firm of whom we have been buying is losing money, and when they 'go broke' and are sold out, we will start up again, if prices go up to a paying basis."

The New England Steam Brick Company has decided to use oil as a fuel at their plant at Barrington, R. I., and are arranging their kilns for that purpose. They hope by this means to reduce the cost of fuel and to improve the quality of their product. The latter feature, they think, is assured. They also expect to shorten the time of burning by about two days. There is no question about the advantages of oil as a fuel where it can be obtained at a price that will justify its use, the saving of labor in handling fuel being of itself quite an item. The Barrington plant is the first one to use oil as a fuel in burning brick in the New England States.

THANKSGIVING.

Before another number of the Clay-Worker reaches its readers they will have passed that annual festival known as Thanksgiving Day. We propose no homily for the occasion, but there exists between a periodical, which is welcomed into so many families as ours, that invisible but real sympathy which makes the joys of one the joy of the other to such a degree that we come uninvited into every household where Thanksgiving festivities take the place of the routine of family life, and we think it no intrusion to partake not only of the traditional turkey and pumpkin pie, but of that richer feast, good-fellowship and friendliness next to kinship. We join with everyone in recalling the thousand things we all have to be thankful for, recognizing there is One to whom thanks are due, for He it is who has "crowned the year with goodness and made our paths drop fatness." The year has been a fruitful one on our side of the world. Only here and there have crops been below the average, and even then the partial failure has been confined to only a few products. Except the scourge of yellow fever in limited districts, the health of the country has been good, and industry has been rewarded with fair returns. Even if for a moment we forget we are part of one great whole and confine our retrospection to our special industry, we find much to be thankful for. Clayworking has kept steady pace with the upward tendency of all American industries, and we may well be thankful that the reaction from the prostrations of a year ago has not been of the boom and spurt variety,

which would necessarily have collapsed sooner or later, carrying disaster with it, but is of the more abiding sort. Coming steadily, though slow, it lasts longer and will prove more beneficial to the masses. We are thankful for it, and trust that our friends and patrons throughout the land may view the situation in the same light, looking forward, not backward, full of hope and "turkey."

THE BUILDING AND PAVING OUTLOOK.

The indication in this section of the country is that there will be more building and more street work within the coming year than has been known for many previous years. This, of course, is owing to the improvement in times and the desire to make substantial structures where poor buildings or delapidations formerly existed. The improvement of streets is becoming a matter of sentiment, and is extending from the cities to the towns. It is no longer creditable to live in a town with bad streets. The example has been set by the large cities, and is now progressing to the smaller towns and cities. The spirit of improvement is quite pronounced in this section. Another thing leading to improvements in streets is the easy method of payment. In many States the period of payment extends through ten years. Indianapolis has repaved nearly all of her streets during recent years on this plan. With our improved literature upon the subject of paving brick, the sale of brick to cities for this purpose should be augmented.

CREDITS.

The matter of organization would influence credits. A man without means or without intent to pay would find it difficult to do business. This is as it should be. Under the present strife to sell brick the question of credit or the annoyance, difficulty or expense of making collections is not given due weight. Of course, there is the protection which may come from liens, but this involves time and disagreeable experiences. Nearly every extensive brick manufacturer has accounts with bricklayers which have been carried along from year to year, with little prospect of realizing anything upon them. How often are brick sold to contractors who are known to be poor pay, simply because competitors will presumably furnish the brick and take chances of getting the price in some way. This one feature of the business justifies organization, even if prices are not regulated.

RAILROAD STATISTICS.

The Interstate Commerce Commission has published the results of its long and patient compilation of figures relating to every branch of the railroad interests of the country. While most of the information is of real value only to railroad men, there is much of interest to such of the general public as wish to be informed on passing events. For instance, it will be of interest to all wide-awake men to know there are 183,770 miles of railroad in the United States, but this, to the average mind, gives no adequate idea of the magnitude of the railroad interest, except by comparison. Conceive of seven parallel roads around the globe at the equator, with more than enough track left to make a railroad from New York to San Francisco, and you begin to have an idea of the extent of the railroad interests June 30, 1896, down to which date the figures of the report come. Then think of 826,640 employees. One can hardly grasp the size of such an army without comparing it with some large army of men more or less concentrated. The Union army of the late war never mustered more than 800,000 in actual service at one time. The railroad army outnumbers that. When asked what becomes of the vast sum taken in by the railroads, we are informed that \$468,824,531 were distributed to this army of employees—not equally, of course, but averaging

nearly \$600 per man, absorbing more than 60 per cent. of the entire running expense of the roads. The gross earnings of the roads was \$1,150,169,376, but after deducting all expenses there was left only \$89,631,926 to be divided among stockholders or put aside as surplus. As the capital invested is \$10,564,865,771, this is not a very extravagant per cent., though as the stock in some roads pays no dividends, it is plain that in others the dividends are quite remunerative. There were, June 30, 1896, 1,297,649 cars, or enough to make a train long enough to reach around the globe if coupled together.

But the figures which will most interest the general public relate to the number of passengers carried and their comparative immunity from accident while traveling. These show that during the year 181 passengers were killed and 2,873 were injured, which was one passenger killed for every 2,827,474 carried, and one injured for every 178,132 carried; or, reducing all to passenger-miles traveled, one was killed for every 72,093,963 miles traveled, and one was injured for every 4,541,945 miles traveled, showing railroad traveling not very hazardous. The showing as to employees is quite otherwise, showing the vocation to be so hazardous that 1,861 were killed and 29,969 injured, or one killed to every 444 employed, and one injured to every 28 employed. Trainmen are especially exposed, as the figures show one killed for every 152 employed, and one injured to every 10 employed.

HIGH ART POTTERY.

One of the most interesting papers read before the Art Convocation at Nashville, on the 4th and 5th of October, was that on "The Development of American Pottery," by Miss Laura Fry, in charge of the Art Department of Purdue University, at Lafayette, Ind. Miss Fry is eminently qualified to speak on this subject. Her early training was in the studio of her father and grandfather, both men of deep artistic feeling and undoubted ability. The wood carvings now being produced by her father are second to none as works of art. Miss Fry studied in the Cincinnati Art School, and was one of the original members of the Cincinnati Pottery Club. She and a few other interested workers in art pottery rented a room in connection with one of the old potteries in that city, that they might be near the base of supplies and the kiln. These women were not only sincere workers, but brave experimentalists. This was before the high-art pottery had developed in this country, and while the experimenting that was to lead to our present high class of ware was still to be made. Miss Fry had with her at Nashville some of these early productions—works which exhibited a freshness and daring not found in our later work. They were often crude, lacking in the conception and finish of our present ware, but they possessed the true art spirit—the self-expression of the artist. Miss Fry told also of the early history of the Rookwood pottery, with which she was long connected. She spoke at length of the artists connected with its early history, of the growing appreciation of this truly American ware, of the attempts of European potters to find the secret of its production through the breakage of the ware. She exhibited pottery in the various styles produced at Rookwood since its inception, and explained the trade-mark used.

Miss Fry also exhibited specimens of Lonhuda ware, which bears a close resemblance to the Rookwood, and which, she said, only needed to be properly placed before the public to attain as great a reputation. She spoke entertainingly of the men who started this pottery, which stands second in art production in this country.

The Paulina pottery stands third. The tale told of the beginning of this pottery sounds, as Miss Fry said, like a fairy tale. But, marvelous or not, Miss Fry was intimately connected with its beginning, and spoke from personal knowledge. The specimen of ware shown was most interesting, with its yellow base and delicate tracery of stem, leaf and bud. Though radically different, it is as thoroughly original and American in

its way as the Rookwood—a production of which we may well be proud.

The Chelsea pottery was spoken of in high terms, and mention made of the American Belleek produced in Trenton—a ware not American, but one copied from the factory in Ireland. The story of its first production was most graphically described.

Miss Fry's lecture was both interesting and instructive, and impressed her hearers with the fact that American pottery is now equal in art excellence to that of the old world.

CONVENTION DEVELOPMENT.

Convention reports of the National Brick Manufacturers' Association outline the history of recent progress in the art of clayworking. The commercial importance of brick, the increasing market, developed a demand for improved methods. The cost price of a few years ago, if it prevailed to-day, would develop an immense profit. Knowledge of improved methods in brickmaking has been given out through the conventions. No one can say that he has given more than he has received, for, while he has been giving as an individual, he has received from the mass. While the general character of the work of the Convention, from time to time, has changed, it has hardly been perceptible from year to year. The earlier conventions dealt with cruder conditions, coarser details. The result of the first Convention was to lead people to think; the work was educational. The first conventions were made up of a lot of self-satisfied members. Many of them felt that they had all but mastered the science and had certain advantages over their companions, and that in a few years the work would be done. Such thought comes before education. It did not take long to find out that the full knowledge, nor anything like it, was not in the possession of a few individuals. After the early work of learning to think and setting aside of great personal prejudice was partially accomplished, there came the more open-minded consideration of general principles; afterwards the finer mechanical details. Then came the chemistry of clayworking, so that now we have a distinct science, developed through the medium of our conventions, out of which have grown text books by its members and their students, and altogether we have a manufacturing business which calls for the highest class of scientific and practical information. Many of the general principles have been fully settled, so that now we find our conventions considering matters of mechanical or technical detail, as well as improved business methods. There is much yet to learn.

STANDARD PAVING BRICK TESTS.

EVERY MANUFACTURER of first quality paving brick is directly interested in establishing a uniform method of testing paving brick, as a matter of self preservation, for uniform tests mean impartial comparison. Hence, it behooves paving brick manufacturers to put into the hands of municipal officers and city engineers a copy of the Report of the Paving Brick Commission. It is a neat book of 110 pages, containing all of the comparative tables and charts compiled for the National Brick Manufacturers' Association by a Special Commission, under the direction of Prof. Edward Orton, Jr. The universal adoption of the methods recommended by the Commission will redound to the credit of paving brick and to the profit of the manufacturers, to whom the Report is offered at the following prices:

Single copies	\$ 1.00
Ten copies	5.00
Twenty-five copies	10.00
Fifty copies	17.50
Seventy-five copies	25.00
One hundred copies	30.00

Address all orders to

T. A. RANDALL, Secretary N. B. M. A.,
Indianapolis, Ind.

TABLE OF CONTENTS.

American Architecture in Clay 315	Brick vs. Steel Construction.... 372
Brick as they are Manufactured in Durham and Northumber- land, England..... 316	The Decatur Convention..... 373
Some new Improvements and Wares..... 317	Taking His own Medicine..... 394
A Side Line 317	CORRESPONDENCE :
Modern American Front Brick 350	Pacific Coast News 373
Button-Hole Talks 353	Quick Work—A Good Word for Decatur..... 382
Weber's Patent Paving Brick.. 353	Treasurer Sibley Reports Pro- gress 382
A Clay Curbstone in Germany. 353	The Situation in Chicago—Bet- ter Prices Prevail..... 382
The Best Fire-Proof Construc- tion for Buildings Occupied for Mercantile Purposes 354	Cold Spots—A Secret Remedy.. 382
German Notes..... 357	Looking After Foreign Markets 383
Making Brick in Mississippi... 357	A Klondike at Home..... 383
The Use of Steam in Brickmak- ing 358	Small Country Brick Yards ... 384
The Development of Hollow Block Manufacture..... 360	The Boom in Building Opera- tions 384
Interesting Work of a Noted China Painter — "Monitor" China—"Murrhines" 362	Ohio Valley News..... 384
Official Announcement..... 364	The New York Market..... 393
Ex-President Morrison Well Pleased 364	EDITORIAL :
Remarkable Illustrative Pitch- ers..... 365	Current Comment..... 385
The Use and Abuse of Claywork- ing Machinery..... 365	Thanksgiving..... 385
Cream-Colored Brick—How they are Made in Milwaukee..... 366	The Building and Paving Out- look..... 386
By the Light of the Kiln Fire.. 368	Credits..... 386
Manufacture of Bricks near Dwellings 370	Railroad Statistics 386
The "Perfect" Clay Screen..... 370	High Art Pottery..... 386
The No. 25 Plunger Machine... 371	Convention Development 387
Remarkable Results in Drying. 371	Standard Paving Brick Tests.. 387
	Editorial Notes and Clippings.. 390
	MISCELLANEOUS :
	But it Pays..... 349
	Overwork as bad as Idleness... 356
	"Is it Luck?"..... 359
	Ads Can Not be Copyrighted ... 370

Index to Advertisements on Next Page.

Books for... Brickmakers.

"CLAY GLAZES AND ENAMELS," Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL," Morrison and Reep,	3.00
"BRICKMAKING AND BURNING," J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS," Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK," H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE," J. J. W. Billingsley,	1.00
Mailed, postage free, on receipt of price.	

T. A. RANDALL & CO.,
Indianapolis, Ind.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page.
Ross-Keller Brick Machine Co.	343	The American Clay-Working Machinery Co.	417
Simpson Brick Press Co.	341	The Fernholtz Brick Press Co.	342
The Chisholm, Boyd & White Co.	340		

Brick and Tile Machinery.

Anderson Foundry and Mach. Works	413	Steele, J. C., & Son	407
Baird and Son, H. C.	402	The American Clay-Working Machinery Co.	417
Brewer, H. & Co.	405, 415	The Horton Mfg Co	388
Carlin's Sons, Thomas	396	The Eastern Machinery Co.	418
Central Machine Works	400	The Henry Martin Brick Mach. Mfg. Co.	411
Chambers Brothers Co.	337, 412	The Leader Mfg. Co.	412
Chicago Brick Machinery Co.	393	The Ohio Ceramic Engineering Co.	338
Eagle Iron Works	400	The Wallace Mfg. Co.	419
Freese, E. M. & Co.	416	The Wellington Machine Co.	391
Hensley, J. W.	401	Williams Patent Crusher and Pulverizer Co.	410
Kells & Sons	402	Wiles Co., A. M. & W. H.	407
Means & Co., Jas.	400	Woolley Foundry and Machine Works	411
Madden & Co.	401		
Newell Universal Mill Co.	410		
Potts & Co., C. & A.	414		
Raymond & Co., C. W.	389		
Stedman's Machine Works	407		

Brick Kilns and Dryers.

Alsip, S. H.	406	Sharer, Geo. W.	409
Cummer & Son Co., The F. D.	395	Swift, F. E.	399
Eudaly, W. A.	408	The American Blower Co.	399
Hundt & Co., F.	398	The Fernholtz Brick Press Co.	342
Morrison & Co., R. B.	408	The Standard Dry Kiln Co.	344
Pike, E. M.	398	Wolff Dryer Co.	420
Phillips, S. G.	405	Yates, Alfred	398
Reppell, L. H.	406		

Brick Yard Supplies.

Arnold, D. J. C.	338	The Atlas Bolt & Screw Co.	395
Coldewe & Co., G.	403	The Buck Machine Co.	402
Carnell, Geo.	406	The Harrington & King Performing Co.	339
Cox, Geo. S.	398	The Henry Martin Brick Machine Mfg. Co.	411
Caldwell & Son Co., H. W.	399	The Keystone Brickyard Supply Company	399
Carmichael, T. W.	401	The Pittsburg Mineral Screen Company	398
Elder & Dunlap	397	Wagoner, M. V. B.	402
Marion Steam Shovel Co.	409	Walworth Run Foundry Co.	399
Mey, F. H. C.	398		
Mershon & Co., W. B.	339		
Newton, A. H.	403		
Phillips & McLaren	397		

Miscellaneous.

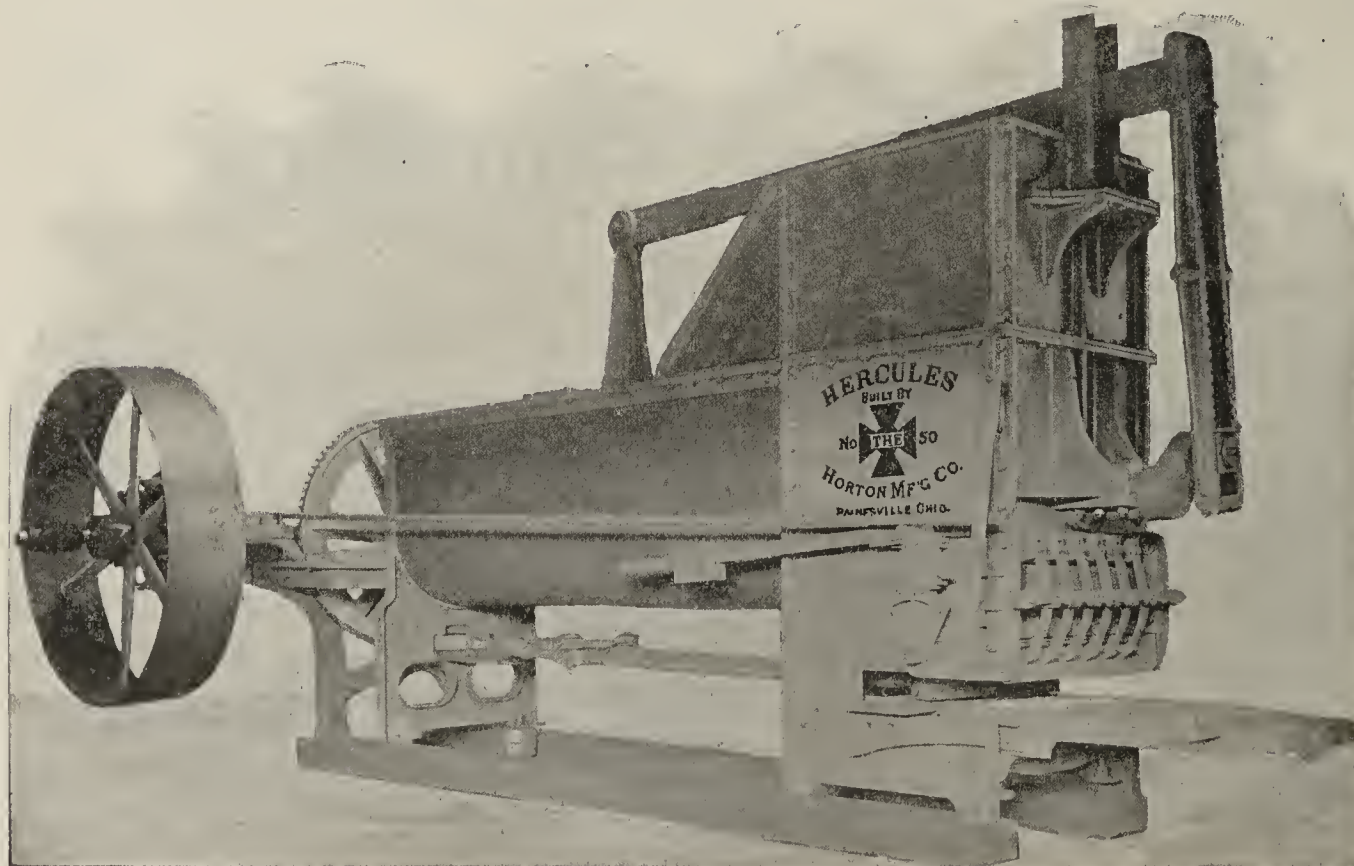
Associated Trade & Industrial Press	401	Kendall & Flick	397
Baird & Co., Henry Carey	401	Lake Erie & Western	402
Big Four R. R.	404	Main Belting Co.	401
Cincinnati, Hamilton & Dayton R. R.	405	Monon Route	403
Chesapeake & Ohio R. R.	398	Osborne, W. R.	400
Cotton Belt Route	402	Pennsylvania Lines	403
Dean Bros. Steam Pump Works	400	Ropkey-Mason Engraving Co.	402
Dover Fire Brick Co.	396	Tennille, A. F.	402
Evens & Howard	397	The E. W. Vanduzen Co.	401
Gabriel & Schall	397	The Union Hardware Co.	403
Geysbeck, S.	396	The Jeffrey Manufacturing Co.	401
International Correspondence Schools	405	The Rockwood Mfg. Co.	403
Indiana, Decatur & Western	405	The Sheldon Distillery Co.	404
Illinois Central R. R.	404	Vandalia Line	404
		Westbrook & Wells	400
		Small Ads., Wanted, For Sale, etc.	

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker

HERCULES.

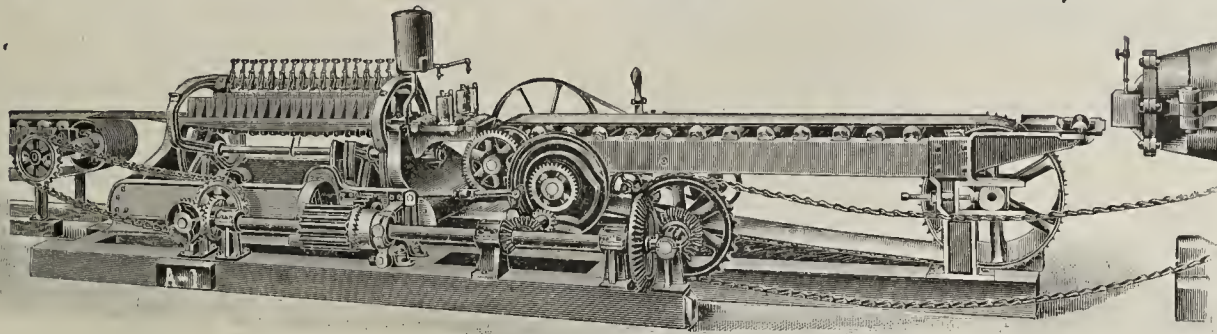


The Acme of Simplicity.

A Giant in Strength. Pug Mill and Machine combined. An Upright press that never wears. No leakage. Guaranteed to make 5,000 brick per hour.

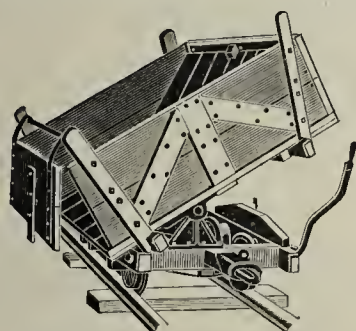
The Horton Mfg. Co.,
Painesville, Ohio.

Yes Sir-ree! We Make 'em all, We do!

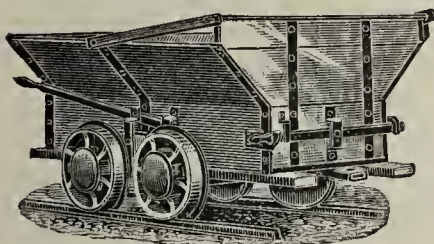


Automatic Side Cutting Table.

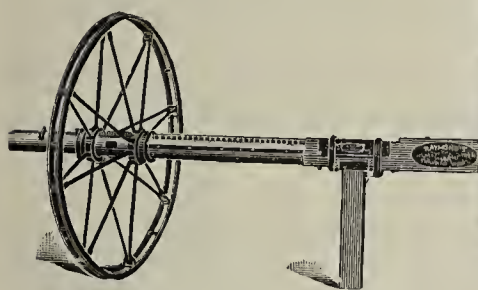
An' we make a whole lot more besides,



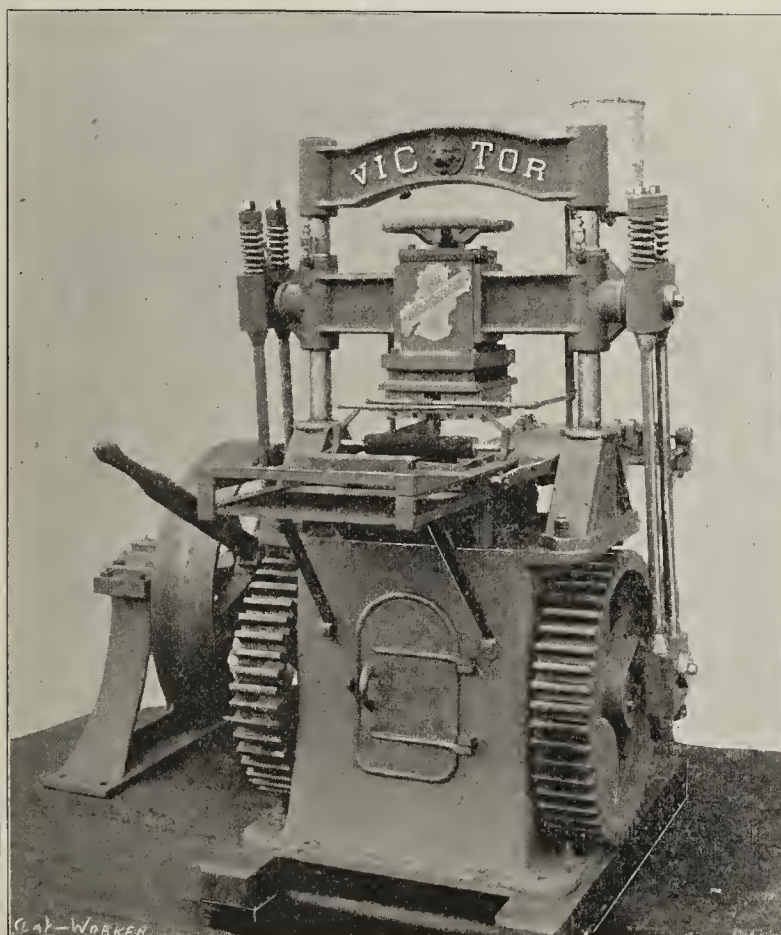
Automatic Dumping Car.



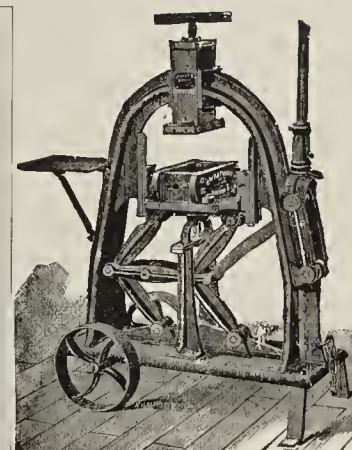
Bottom Dumping Car.



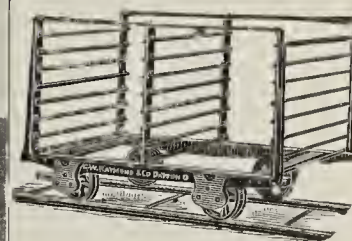
Wrought Iron Tempering Wheel.



The Raymond "Victor" Repress.

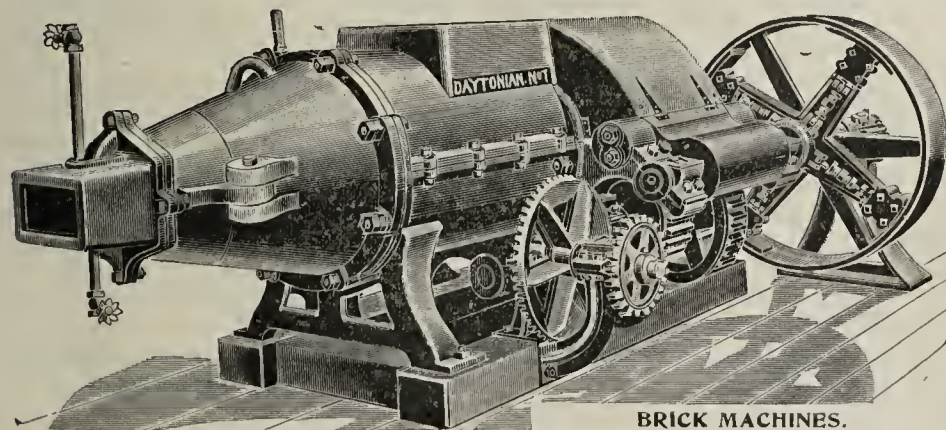


Perfection Brick Press.



Dryer Cars.

Ef you don't believe it just send for our catalogue.



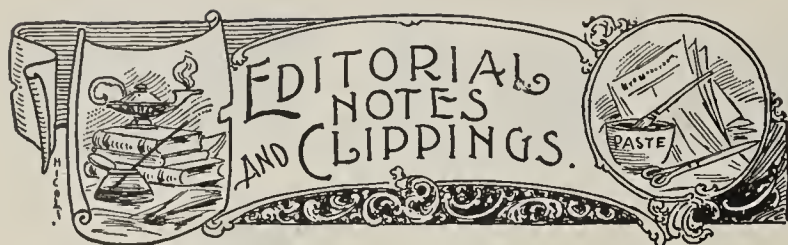
BRICK MACHINES.

We Sell 'em too like hot cakes.

...

**C. W. Raymond
& Company,**

Dayton, Ohio.



Burdock & Windsor will start a pottery at Fruitvale, Cal.

A. A. Graves is making improvements in his brick plant at Winooski, Vt.

A brickyard will be established at South Bend, Wash. C. O. Rude is interested.

Damage amounting to \$300 was caused by fire at the brickyard of Hacker & Son, at Bath, Me.

A company to be known as the Stillmore Brick Company has been incorporated at Stillmore, Ga.

James Hutton, of Dubuque, Iowa, contemplates building a new brick plant at New Hampton, Iowa.

James Dayton suffered a slight loss by the burning of the sheds at his brickyard at Manston, Wis., recently.

A. Randall contemplates establishing a paving brick plant at Catskill, N. Y., with a daily capacity of 75,000 brick.

The burning of some sheds at the brickyard of W. H. H. Smith & Son, at St. Louis, Mich., caused a slight damage.

John P. McIntyre has secured control of the immense brick plant at Blair Station, Pa., and will at once begin operations.

Mr. G. A. Guignard is making arrangements to operate his brick machinery at his plant at Columbia, S. C., by electricity.

The Portland (Me.) Stoneware Company has taken up the manufacture of vitrified street pavers, and is making a success of it.

T. Parmele has leased the steam brick plant at Louisville, Neb., and is putting same in shape to operate it at its full capacity.

A stock company will be formed at Tnnkhannock, Pa., for the purpose of manufacturing brick. S. Judson Stark is the prime mover.

W. Lovell Baldridge has leased the brickyard of Babcock & Hemphill, near Duncansville, Pa., and will begin operations in a short time.

Levi & Gormley, paving brick manufacturers at York, Pa., contemplate locating a brick plant in the vicinity of Weatherly and Hazelton, Pa.

Herman Groscep has purchased William Pray's interest in the brick business at Ashley, Md., and will continue to operate the plant himself.

H. B. Nelson, Manager of the Weston, Ore., brickyard, reports a good business for the past season and splendid prospects for next season.

The Peerless Clay Company has been incorporated at Butler, Ga., for the purpose of mining a clay to be used in the manufacture of paper.

The large brickworks of Bridges & Sons, at Wabash, Ind., was badly damaged by fire October 25th. The sheds and all machinery are a total loss.

L. L. Stephenson, Elberton, Ga., writes us that he wants prices and information on steam brick dryers. He wants one of about 25,000 daily capacity.

The brick plant of J. B. Fahey at Bay St. Louis, Mo., was burned to the ground the early part of last month. The loss is about \$2,000, with no insurance.

A charter has been granted the Blackwell (Okla.) Brick Company. The incorporators are L. S. Shelton, J. B. Dunlap and M. E. Richardson. The capital stock is \$7,500.

In renewing his subscription to the Clay-Worker, Harry Roberts, Ventura, Cal., advises us that he would like to receive information regarding a small standard brick machine.

Claude Hancock will manufacture brick at Riverside, Cal. Ground has been broken for the new plant, and the work of building will be pushed forward as rapidly as possible.

Hiram Doud, an employe of the Haleyon Brick Works, at Black River Falls, Wis., was quite seriously injured by the caving in of the walls of a brick kiln which was being built.

F. G. Nott is making preparations to erect a brick plant at Howard Lake, Minn. The clay on his land has been tested

and proven of excellent quality. Mr. Nott says his plant will be equipped with modern machinery and appliances, and be up-to-date in every particular.

W. T. Munn, Chestnut Bluff, Tenn., writes that he expects to make some improvements in his brickyard for next season, and would like to receive price lists and catalogues of soft mud machines.

A fire at the brickyard of Alonzo Rose & Co., at Flatbush, N. Y., entailed a loss of \$1,000. The flames spread from the Rose plant to the Overbaugh brickyard, which was also quite badly damaged.

E. C. Henderson is organizing a company at Cumberland, Md., to manufacture paving, building and hollow brick. A large plant will be erected. Mr. Henderson's address is 12 Seymour street.

The tile factory at Crescent, Ohio, formerly owned by J. C. Elliott has been purchased by J. Clippinger, who lost no time in getting same in running order, and is now turning out a good grade of drain tile.

Davidson & Avery, of Houma, La., advise us that they have a customer who is in the market for a horse-power brick machine of 15,000 daily capacity, and will accordingly be glad to receive catalogues, price lists, etc.

J. C. Steele & Son, Statesville, N. C., write encouragingly of their brick machinery trade. They say: "Our trade has been unusually large for this season of the year, having sold more brick machinery than ever before."

The Charter Oak Brick Company, Hartford, Conn., has made an assignment. Bad business, keen competition and poor collections are given as the cause of the failure. The liabilities of the company amount to \$25,000, while the assets are \$20,000.

A new venture at Ogden, Utah, that is proving fairly successful is a pottery, operated by J. S. Smith and C. Garff. At present they are turning out nothing but a good grade of drain tile, but they expect to manufacture a higher grade of products next season.

James H. Horner, Astoria, Ill., in a recent letter says he is well pleased with his summer's work, having just taken a large order for the new waterworks. Mr. Horner says: "Times are very much better, money more plentiful, and everybody happy."

The death of James H. Lyons, a well-known pottery manufacturer of Trenton, N. J., occurred November 5th, after a short illness. He was connected with the Lyons Pottery Company, in which business he was actively engaged at the time of his death.

Battle Creek, Mich., which town, the local papers say, has heretofore been noted as having the worst paved streets in Michigan, has just finished paving her business streets with brick, at a cost of \$25,000, and now has some of the finest and best paved streets in the State.

W. A. Baden, Manager of the Baden (Cal.) Brick Company, in sending in his subscription to the Clay-Worker, advises us that they would like to hear from brick dryer and brick machinery people. He says his brick are turning out much better than they had ever anticipated.

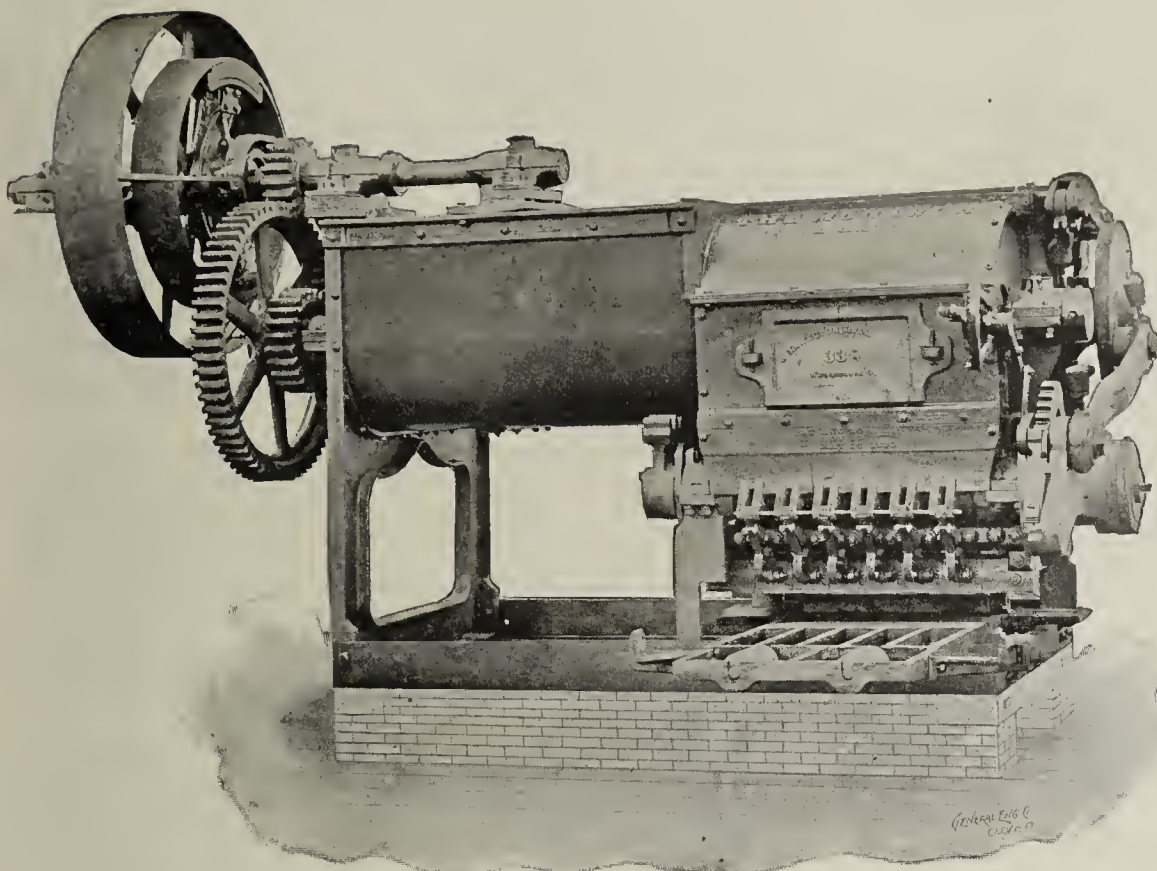
Joseph Prutzman, a well-known brick manufacturer at Muncie, Ind., died October 29th, after an illness of several months. He was an old and highly respected citizen of Muncie, and his many good traits of character made for him a host of friends, who share the grief of his family.

Joseph S. Kerr, a prominent and wealthy citizen of Finleyville, Pa., died at the home of his father-in-law, in that city, October 21st. He had a large brick plant at Hackett, Pa., which he had operated successfully for a number of years. Mr. Kerr was but thirty-one years old, and leaves a wife and two children.

W. S. Purington, says the Galesburg (Ill.) Mail, General Manager of the Purington Paving Brick Company, is rejoicing over the victory won by the Purington brick exhibit at the St. Louis fair. In competition with paving brick from all over the country, it was decided to be the best of the lot, and was awarded first prize.

E. B. Miller, Tuscaloosa, Ala., writes that extensive and valuable beds of fire clay, shale, potters' clay and black swamp clay have recently been located in that vicinity, and that, so far as tested, they have proven to be of excellent quality. Fuel is very cheap in that section, coal selling for 35 cents per ton and yellow pine for \$1 per cord, and as their freight rates are comparatively low, brick being shipped to

[CONTINUED ON PAGE 392.]



THINK IT OVER

IT'S TIME to figure what you will do next season.

If not familiar with our machines, let us tell you where to go and see the one nearest you before the season closes. We WANT investigation.

The "Monarch"

Horizontal; with Double Pug Mill and Double Presses, and other valuable features contained in no other.

The "Iron Quaker"

Upright; simplest, best and lowest priced of any real competitor.

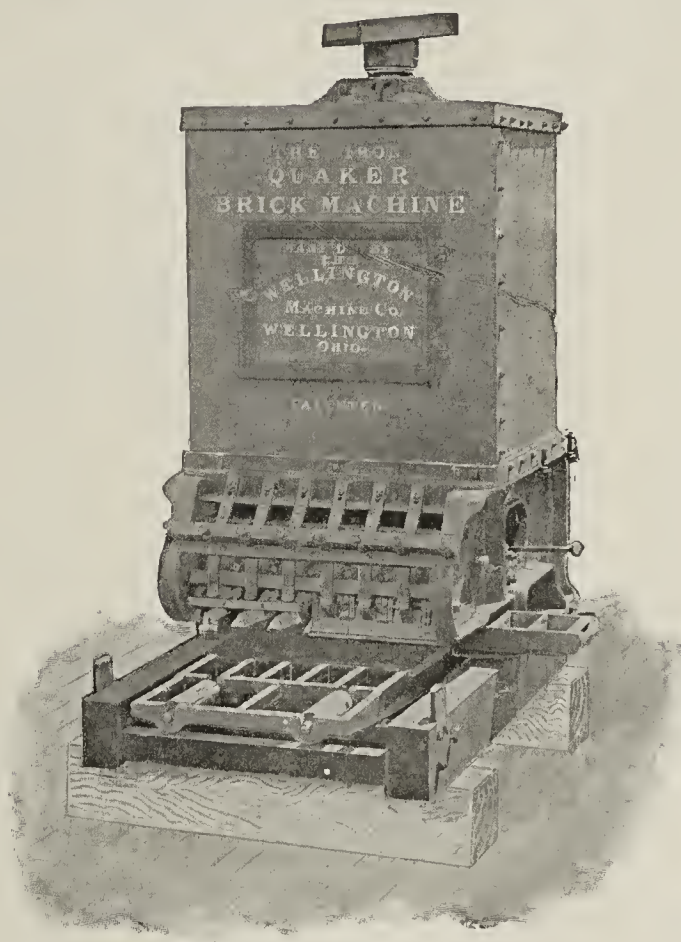
These two machines are unquestionably the leaders of the "sand-moulding" class.

AUXILLIARY MACHINES AND SUPPLIES.

Pug-Mills, Disintegrators, Crushers, Mould-Sanders, Represses, Winding Drums, Dump Cars, etc., Moulds, Dump Tables, Dryer Cars, Kiln Doors and Castings, Elevators, Dump Carts, etc., etc.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE.

Odd sizes of moulds. Have not been used.
5 moulds, $8\frac{3}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
20 moulds, $8\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 in. partitions.
17 hand moulds (3's) standard size.

Second-hand, but used a few days only.
10 moulds, $9\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
19 moulds, $9\frac{1}{2} \times 4\frac{1}{2} \times 2\frac{3}{4}$. " " "
16 moulds $9\frac{1}{4} \times 4\frac{1}{2} \times 2\frac{3}{4}$. 9-16 inch partitions.
16 moulds $9 \times 4\frac{1}{2} \times 2\frac{1}{2}$. 9-16 inch partitions.
10 moulds, standard size.

The Wellington
Machine Co.,

WELLINGTON,
OHIO.

Send
for
Circular.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

Mobile and New Orleans at 75 cents a thousand, thinks it is a good point for the location of brick, tile and pottery plants. Good land can be purchased at \$10 per acre. Mr. Miller will be pleased to correspond with anyone looking for a desirable site for the establishment of industrial interests of any sort.

The Leader Manufacturing Company, Decatur, Ill., write that they have had a good trade through the fall months. There is a lull now, which they think is sure to be followed by an active season. They are putting their shops in order for a big run next year.

A brick company is being organized at Troy, N. Y., for the manufacture of vitrified paving brick. The persons interested in the project are John T. Christie, James H. Caldwell, Thomas Stone, A. H. Deavitt, Moses Warren, Charles T. Faulkner, Fred A. Tolhurst, William D. Hardy, and others. They will have a capital stock of \$75,000.

In their ad. on page 410 the William Patent Crusher Company call attention to the fact that the Hydraulic Brick Company, St. Louis, have ordered another Williams Crusher, making three of these machines now running at Hydraulic plants, and they expect to put in two more very soon. This Mr. Williams considers a very satisfactory testimonial.

The Bonnot Company, Canton, Ohio, suffered a loss of \$5,000 by fire on the 16th of October. Mr. Whiting, the genial Secretary, informs us that the fire did not interfere with the filling of orders, as they immediately made arrangements to have their castings made elsewhere until damage can be repaired. They say they have done a good business the past season.

The Steelton and Harrisburg Brick Co., Harrisburg, Pa., operating three of the largest brickyards in Pennsylvania, expect to increase their equipment soon. They now have large plants at Harrisburg, Steelton and Highspire, and, with the additions and improvements they contemplate, will have the largest capacity of any brick company in central Pennsylvania, so they claim.

The Leavenworth Paving Brick Company, Leavenworth, Kan., have purchased a complete outfit from the Simpson Brick Press Company, consisting of one of their new style four-mold presses, one of their screens, equipped with their well-known brushing device, and one of their improved steamers. The Leavenworth Company declare themselves highly pleased with the Simpson outfit.

J. R. Blower, Osceola Mills, Pa., writes that he has thirty acres of good fire clay, and as he has not capital sufficient to build a brick plant, would either like to sell the fire clay in bulk or sell a site for a brick plant. Fuel in that vicinity is cheap, as it will be delivered on the ground for six cents a ton. Mr. Blowers will be glad to communicate with parties looking for good clay land.

J. H. Barber, the multi-millionaire of the Barber (Ohio) Match Company, is projecting a scheme for the consolidation of all the principal art tile and pottery works of the country. A site has been secured near Toledo, Ohio, and the plans on exhibition in that city show immense grounds, with sites for factories, school-house, hall, residence streets, etc., but as yet comparatively little is known regarding the deal.

The Lehigh brick and tile plant at Webster City, Iowa, was completely destroyed by fire November 2d. The loss is \$25,000, on which there is an insurance of \$25,000. The plant was owned by Messrs. Burnham, of Milwaukee, and Wilson, of Webster City. The cause of the fire is supposed to have been incendiarism. The burning of the plant, Mr. A. Tidmarsh, the Secretary, writes, will be quite a loss to Lehigh, as it throws fifty or more men out of employment.

The Arkansas Brick and Manufacturing Company has been incorporated at Little Rock, Ark. The new firm is composed of W. W. Dickinson President, E. N. Weigel Vice-President and Manager, and John W. Dickinson, Jr., Secretary and Treasurer. The company has purchased the plant of the Weigel Brick Company, which already has a daily capacity of 60,000. New machinery will be put in, the capacity increased, and plant improved until it is one of the largest plants in the South.

T. Richardson, Secretary of the Houston (Tex.) Business League, says that there is a splendid opening in that section of the country for an enterprising tile manufacturer. All the tile now used down there is being shipped from St. Louis, and as the demand for drain tile in Texas is constantly increasing, the first man to take advantage of the opportunities offered can make a fortune. J. H. Connell, of the Texas Agricultural Experiment Stations, in discussing the matter, says: "It is a well-recognized fact that the soils near Houston are in every

way well suited for the manufacture of tile, brick and other forms of earthenware, and certainly no better railroad facilities can be secured in the State. In addition to these advantages, Houston is situated in the midst of a section that is rapidly developing its fruit and vegetable lands, and these seriously stand in need of drainage for their most profitable development. It, then, must be but a few years before much tile is used in that vicinity."

The Ohio Ceramic Engineering Company, Cleveland, Ohio, report an increase in business. Among recent orders is one from the Montello Clay and Brick Company, Reading, Pa., for a repress. They recently shipped a repress to Sayre-Fisher Company, Sayreville, N. J., being the fourth machine of the kind they have sold to that one company. They have also filled a large number of orders for plain and ornamental molds, and say their business in that line is increasing as the merits of their molds are being recognized.

The American Blower Company, of Detroit, report that business in the line of brick dryers continues to show evidences of the returning "good times." Among recent contracts is one for a large dryer for Belfast, Ireland; also similar orders from the Harbison & Walker Company, Pittsburg, Reese, Hammond & Co., Bolivar, Pa., and from the Trenton Fire Clay and Porcelain Co., an order for an apparatus to duplicate one of very large capacity furnished about a year ago. Outside of this particular line their business is very brisk, and the conditions more resemble those of the year '92 than at any time since then.

William R. Haven, a well-known contractor of Buffalo, is going to establish a brick plant at LaSalle, N. Y. Mr. Haven is already the owner of a brickmaking plant that is valued at \$50,000. During the winter he will move this plant and its machinery to the site that he has leased at LaSalle, and it will be set up and ready for business in the spring. In addition to building-brick, Mr. Haven announces that he will manufacture sewer and paving brick. He will have excellent shipping facilities, as the product can be easily loaded upon the barges that do business along the lumber district of the river. He says he has known of the superior quality of the clay near LaSalle for ten years, and has had an idea for several years that some day he would make brick there.

THE IOWA CONVENTION.

The Brick and Tile Manufacturers of Iowa will meet in Annual Convention at Des Moines, Wednesday and Thursday, Jan. 12 and 13, 1898. Secretary, C. L. Smith of North English, Iowa, announces that an interesting program is being prepared which will be given in full in our next issue.

T. A. Gunn, Tullahoma, Tenn., wants to purchase some pottery machinery.

W. H. Duffett, 24 Bloss St., Rochester, N. Y., desires catalogues of sewer pipe machinery, etc.

Mr. Philip H. Bruner has resigned his position as Superintendent of the Cleveland, Lorain & Wheeling Railroad to accept the position of General Manager of the Vulcan Clay Works, of Wellsville, succeeding Mr. James Reed.

Another pottery has been started at Stockton, Cal. The venture is being backed by Mr. Maple, who originated the first Stockton pottery. It is said that the first goods to be turned out will be terra cotta work, but that afterwards a regular pottery business will be conducted.

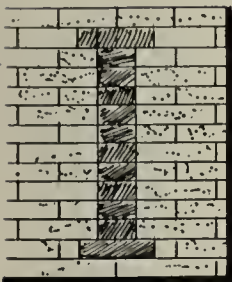
The output of pottery in East Liverpool, Ohio, is conservatively estimated to be \$4,000,000 annually. Great improvements were made in all departments this year, and the capacity of this clay city is over 150 kilns, 13 of which were added this year, and 27 new decorating kilns were added. Contracts for two new plants have been let, and they will be in operation before spring.

President H. A. McNichol, of the Dresden Pottery Company, East Liverpool, Ohio, one of the manufacturers' conference committee which is now preparing the new scale, said in a recent interview that the manufacturers would be ready at the time designated, December 25th, to restore to the working potters the 12½ per cent. cut. He also said if the advance in wages had been made in thirty days following the Atlantic City conference, the manufacturers would have been compelled to increase the selling price of ware. The sequel would have been that the importers would have gobbled the trade.

WANTED—A first-class brick burner. None other need apply. Address H I d WILLIAMS, care Clay-Worker.

Written for the CLAY-WORKER.

THE NEW YORK MARKET.



IT WOULD SEEM that the weather clerk has made a mess of that commodity this summer, and this fall he is trying to make amends for his mistake earlier in the season. October has been generally fair; with the exception of a day or two, the yards could turn out brick. To get them dry has been rather a difficult matter, as the lack of wind has retarded the drying of them, and the sun's rays have

little power on backs two and three deep.

Will 1897 be the turning point in the trade toward a better demand, as well as better prices, for which the brick trade has been looking since 1888? That year was the beginning of the long era of reduced rates; each year the hope of a reaction was looked for, not that there was no profit in the manufacture, but that the contraction of profit was felt, for the cost of labor and material was not reduced. As the years slipped by and the nineties came along, with almost a steady decline at the beginning of the seasons, it became a necessity that there must be help to carry the reduction in returns by others, and labor was cut. Still down went the prices, till this season the wages paid were low. In fact, a few years ago, if one should have been bold enough to venture the opinion that one dollar and a half per day would be a high rate for labor on the yard, the bosses, as well as the men, would have said, "Never! the men will not work for any such figure; we will look for other work." Both were mistaken; the scale paid did not stop any yard; they could get all the men they wanted, and more.

The past summer has been one long to be remembered by those in the manufacture of brick—one long struggle to keep going, and hoping against hope that each week would bring relief to the hard-pressed pocketbook. If the people who consider all brickmakers well-to-do were aware of the means that

some had to resort to to raise money for use in their business, it would be a surprise to them. The actual truth of the matter is, there are many who are relieved that the making season of '97 is over, whatever may be the outcome. It certainly is encouraging to them, as they look at the brick under the shed, and the market price for them at present, the first of November, to know that there is a profit at last to ship to the New York market. At the same date last year the shipping would mean a loss.

Taking all information obtainable, and the present rates for brick, with the cause of the advance as the basis to work on, it should be a lesson. There is no reason why next season should not be a prosperous one to the trade.

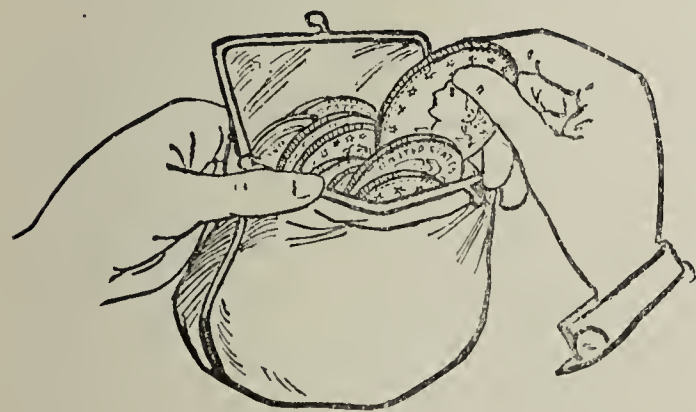
—A Healthy Condition.—

The cause of the market showing a marked tendency to improve at this late day is not because the demand is such that they cannot ship them fast enough, but that some of the near-by shipping points are holding stock under shed, instead of sending them down the river. As making has ceased to a very great extent, the want of room excuse is out of date. The market feels the withholding of a portion. Certainly it is an object-lesson which all manufacturers can profit by in the future. If a partial holding of stock has advanced them in October, why would not the same method work all the season through?

The season being wet, finds less brick under sheds than for many years, which should be of decided benefit in the spring, even if there should be no further raise in price this fall, as the market is in the hands of the shipper, not the buyer. Another factor that the manufacturer cannot seem to agree on is the shortage in number made. Some think the quantity larger than others, but from as close an estimate as can be made there is a shortage of two hundred million. If so, the market will continue to favor the seller.

Another point claimed is, that up to the 15th of October the consumption of brick was about one hundred and ninety millions more than last year. This sounds excessive. One can scarcely think that such a number has been used more than in 1896, but those who are in a position to know make that claim, and it is to be hoped it is true. The amount of brick which are piled or stocked on different yards in New York and Brooklyn for use this winter, when navigation is closed, is

These "Hard Iron Dollars"



You will save by ordering your Brick Machinery this fall instead of next Spring.

You also save the **time, annoyance** and **loss of orders**, caused by delays in getting your machinery when you want it. We cannot make you a sketch of these, but they just as real as the Dollars.

When the machinery men are over-run with orders, prices will naturally advance, and every one must take his turn.

Nearly **every yard** in this country needs overhauling after the long depression. Suppose they all try to buy **at once**. Just think over the situation a little, and **save those Dollars**.

Chicago Brick Machinery Co. 225 Dearborn St.

said to be seventy millions, which, as in other years, will have a tendency to make the market steady in price. When the number is added together it shows nearly five hundred million to help the buyer to keep the market down, and it relieves the seller of such a pressure to put them on the market, and must make a more steady market between the opening of navigation and when new stock comes on the market. It is to be hoped that the figures are correct, and that the manufacturers will profit by past experience, so that when they begin to turn out brick in '98 it will be so regulated that the balance of trade will be in their hands. Time will tell.

—The Effects of Better Prices.—

How the advance affects the brickmaker is here shown: A few days ago I asked one who has two yards if he thought of leasing one of them. "Yes," he said, "if I can get sixty cents a thousand rent." A year ago it would not be taken at half the sum. He now thinks it will be no trouble to get that figure. He also said: "I am at a loss what to do. If I rent it, and as business picks up, as it seems to be doing, I do not know which will return me the most money—run it myself, or rent it out for a term of years." The over-confidence of a return to figures of bygone years may be the means of a heavy burden to the gentleman financially. If he can get a tenant and sixty cents per thousand rent, he will not lose any sleep because the yard pays him no return, as has been the case within the past few years.

—The Year's Record.—

Nine months in the building trade show where the market must get its support. As regards the consumption of brick, as before stated, and as claimed by those who have looked into the matter that the number of brick used is far in excess of '96, would lead one to infer that the number of new buildings were far greater in number than appears on record.

Total nine months 1897, 2,771; cost, \$66,207,660.

Total nine months 1896, 2,558; cost, \$61,386,775.

Total nine months 1895, 3,131; cost, \$69,663,417.

Total nine months 1894, 1,873; cost, \$38,665,522.

Total nine months 1893, 1,892; cost, \$50,558,403.

As will be seen by the figures, there are only 213 more new permits in the nine months last year, and it does not seem possible that such a large number of brick was used; 1895 leads both in number and cost. When a comparison is made with Brooklyn it would lead one to think that the class of buildings must be very small. Certainly when the number of permits are compared, and the cost of same, the class of buildings can in no way compare; the outskirts of the city must be where the erection of houses is going on. The difference of only one permit in the same length of time is marked:

Total in nine months 1897, 2,492; cost, \$10,637,972.

Total in nine months 1896, 2,491; cost, \$10,558,451.

The total number of permits in the two cities for the past nine months is 5,263, which would call for nearly four hundred thousand to a building on a large number of structures, which require a great number of brick. It does seem over-drawn.

—A Good Contract.—

A sale was made within a day or two by one of the yards of about two hundred thousand pale at \$3.25, and seventy-five thousand washed, good or bad, at \$4.75, delivered in Brooklyn. When one looks at the figures, it does not seem possible that pale, which have been selling for twelve shillings to fourteen, should bring that figure; as for the washed, it is about a dollar per thousand above the rates of a month ago.

How times affect the sale of brickyard property has been shown here within the past few days in the sale in sections of one of the best equipped yards in this place. In 1887 the yard, with two machines and shed, pit shed, four tempering wheels and engine, and about thirty acres of land, clay and sand, was bought for \$32,500. The shed was enlarged; another machine, with two tempering wheels, at a cost of about \$3,000, was added, as well as the required barrows, trucks and carts, also money expended on mending, bringing the cost of the property up to about \$40,000. The death three years ago of one of the firm caused a sale. One of the surviving partners bought it, but his death last winter necessitated the disposal of it now. The purchase mortgage of \$15,000 was still upon it. It was offered for that figure, with all that was on the yard, including carts and harness, but no purchasers. The property was in three parts; the one on which the yard was located had enough clay on it to make at least 30,000,000 brick; another strip, bounded by two public roads, contained about ten acres of the best molding sand, and the other section was part wood and some clay, underlaid with clay of a soft, plastic nature, which had been bored to the depth of forty feet without finding bottom. The distance of this from the yard would

have required another horse and cart to draw the clay, but this would not have had any great effect on the cost. As luck would have it, a cemetery adjoined the middle piece and required more ground. This piece was sold for \$6,500. The yard was bought by one of the other brickmakers whose yard was next to it. He got it for \$6,000, including all that was on it for the manufacture of brick, as well as the boarding house and sleeping shanty. If anyone ever got a bargain, this brickmaker did. The other piece may sell as a farm and bring a couple of thousand dollars. If so, it will very nearly wipe out the mortgage. This gives one some idea of the value of clay property in this part of the country. About two years ago one of the large plants was bought in to save some money that had been loaned to the proprietor, with other mortgages on it, for about one hundred thousand dollars. What would it bring to-day? It is now leased to make ten million brick at twenty-five cents per thousand. Where are the interest and taxes coming from?

—Burning With Oil.—

The Standard Oil Company seems to be determined to, as the boy said, scoop everything in sight, and is trying to introduce the burning of brick with oil. A few weeks ago they chartered a boat and furnished it with the comforts for the inner man, and invited all the brick agents, as well as brickmakers, of Haverstraw to take a trip up the river to Rose-ton to see the plant that they had on the yard of J. C. Rose & Co. Whether the pilgrimage to that point may be the means of the introduction of the use of oil is yet to be seen; however, it will be when the brickmakers of tide-water have more money in their pockets than at the present time.

—The Brick Market.—

It is with pleasure that I am able to report a marked advance in the price of brick. It had become tiresome to note no change, or, if there was, to report a falling off. The advance, in all probability, will remain for the rest of the season; possibly the price may still be pushed up. The brickmakers have it in their own hands.

If the present rate induces freer shipments, the rate may remain as it is now. The up-river yards, say from Rondout to Albany, will have to send freely, as the season after November 1st may close at any time. The lower Hudson yards can count until December and late in that month to allow them to get stock to the market. As the fall has been exceptionally fine, work on new buildings has gone right on without stopping for wet weather. Some of the dealers are short in brick which they expected to stock at the low rates, as the holding back of Haverstraw yards started the ball rolling toward better rates.

When the comparison is made with the price of the first of the month, it looks as if the manufacturer will be able to buy a turkey for Thanksgiving day, and certainly he should be thankful on the 25th of the month that he had been spared to see the rate go above \$5 per thousand.

October 1st.	November 1st.
\$2.25@2.50	Pale .....\$3.25
4.00@4.25	N. J. Ordinary..... 4.87½@5.00
4.25@4.62½	Specials 5.12½@5.50
4.00@4.12½	Common Hard Ordinary..... 4.50 @4.62½
4.25@4.37½	Common Hard Good..... 5.00 @5.12½
4.25@4.50	Common Hard Fine..... 5.00 @5.50
4.25@4.50	N. J. Good..... 5.12½@5.25

No advance in front brick. Croton, \$12; Wilmington, \$19@20; Baltimore, \$37@42; Philadelphia, \$20@22 alongside pier; Trenton, \$18@20 alongside pier. From seventy-five cents to a dollar per thousand advance in a month is doing well. May the December report add another dollar!

Hackensack, N. J.

A. N. OLDTIMER.

TAKING HIS OWN MEDICINE.

"Father" Pike, of Chenoa, Ill., writes that he has become a Hoosier. At least he spends a great part of his time in Hoosierdom superintending the drainage on his 1,100-acre farm at North Liberty, Ind. He says: "I have lines laid now for over eight miles of tile, from 4-inch to 12-inch. This is only the beginning, as I am just working on a half section. You see, I am practicing what I have been preaching all these years. Eleven carloads of tile have been ordered from our friend, S. C. Cowgill, and most of them have been delivered, and it will take a few more carloads to finish what I want to do this fall. But do not understand that I will neglect the main issue, viz., the 'New Discovery' kiln. Not so, but will wait on all who want it, with my usual urbanity, as the stock farm is but a side issue."



Read What

H. C. Carroll & Sons, of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE, 60TH AND HAVERFORD STS.

TELEPHONE 147, W. P.

**H. C. CARROLL & SONS,
Brick Manufacturers,**

Residence, 3831 Lancaster Avenue.

3 YARDS: { 57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell your troubles to"

The F. D. CUMMER & SON CO., Cleveland, Ohio.

No. 146. TURNTABLE.

No. 150. STEEL BOTTOM DUMP.

No. 170. STEEL SIDE DUMP.

No. 201. OAK SIDE DUMP.

No. 142. TRANSFER CAR.

THE ATLAS BOLT & SCREW CO.,
CLEVELAND, O., U.S.A.
MANUFACTURERS OF
STEEL BRICK DRYER CARS,
SMALL CARS OF ALL KINDS,
STEEL DRY KILN, LUMBER TRUCKS,
STRONG, LIGHT AND EASY RUNNING.
FULL LINE STEEL WHEELBARROWS.

No. 124. DOUBLE DECK.

No. 105. SOFT MUD FLAT.

No. 126. D.D. STEEL DECK.

No. 103. STIFF MUD FLAT.

No. 136. 3 SECTION RACK.

No. 108. FLAT, STEEL DECK.

No. 133. SOFT MUD RACK.

No. 140. BOX SHOCKS, ETC.

No. 139. SHINGLES, STAVES, ETC.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

FOR SALE.—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address, 11 tf d JESSE T. MORGAN, Wilkes-Barre, Pa.

FOR SALE.—One of the best paying brick and tile factories in Iowa; part pay in good land. Address, PATTON & MUNSON, Lock Box 11, 11 tf dm Lohrville, (Calhoun Co.) Iowa.

FOR SALE.—75,000 second-hand 34-inch pallets; price, 3 cents each on cars, Buffalo. Address, 9 3 c J. F. STENGEL, 928 Ellicott Square, Buffalo, N. Y.

FOR SALE AT A BARGAIN.—One 4-mold Boyd dry press brick machine in perfect condition. THE FERNHOLTZ BRICK PRESS CO., 8 tf l St. Louis, Mo.

NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer. T. W. CARMICHAEL, 6 tf d Inventor and Manufacturer, Clarksburg, W. Va.

FOR SALE.—Paving Brick and Hollow Block Plant containing thirty acres of land deposits of shale clay and coal. Three railroads. For sale at a bargain. Address, 11 1 dk MINE, care Clay-Worker.

WANTED.—Stiff-mud machine complete, eight or nine foot dry pan with mullers on independent shafts, all must be in first-class condition and low price. Address, 11 1 d LASELLE, care Carrier 81, Buffalo, N. Y.

SITUATION WANTED.—Roof Ornaments, Finials, Crestings, Terra Cotta, etc., experienced modeler and mould maker wants situation. Address, 11 1 cm EXPERIENCE, care Clay-Worker.

WANTED.—An energetic man who understands the working of fire clays in the East; with some capital to extend an old established fire brick works. Address, 11 1 d J. E. ANDREWS, 125 E. 70th St., New York, N. Y.

MANAGER — SUPERINTENDENT. — Wishes re-engagement; will take entire charge of plant, in the manufacture of Fire or Red clay products. Brick, tile, pipe, building and other goods. Up or Down draft and continuous kiln. 11 1 c Address, BOX 100, care Clay-Worker.

FOR SALE OR EXCHANGE.—For a good brick plant, farm or city property; 2000 acres of coal lands in eastern Kentucky, title clear and abstract furnished. Good timber on land of Poplar, White Oak, Walnut and Hickory; large vein of coal under the entire tract; oil wells near by. Owner can't afford to hold it. Address, 11 1 lpm BOX 92, Thurston, Ohio.

FOR SALE.—One 8-ft under-geared iron frame wet pan; one 6-ft iron frame wet pan; one new 5-ft pan for wood frame; one Potts stock brick machine; one Potts sand machine; one 7-ft horizontal pug mill; two vertical pug mills; large lot of steel and iron pallets; 20 pallet cars; lot of brick barrows, molds, etc. Address, 11 12 c THOS. CARLIN'S SONS, Allegheny, Pa.

WANTED.—To lease on royalty with privilege of purchasing; a first-class brick plant, or clay bank; thriving town or city; eastern states, Pennsylvania preferred; or would accept position as manager; if satisfactory would invest after reasonable trial. Am a thoroughly practical man. References furnished. Address with particulars, 11 1 c LONG, Box 311, Middletown, Penn.

FOR SALE.—The best equipped Pressed Brick Plant in state of Ohio. Brick have a standard reputation. Finest bed of red and buff clay right at the works. Six down-draft kilns holding 800,000 brick. Daily capacity of presses 30,000. Steam dry house. Kilns have exhaust fan system whereby save about \$2000 per annum in fuel. Best coal \$1.00 per ton delivered at kilns. Cheap labor. Belt line R. R. connects with seven railroads including B. & O. and Pennsylvania system. Largest line of molded dies in the state. Will sell at a great bargain. Correspondence and inspection of plant solicited. Reason for selling, have to move to Colorado on account of health. It will pay you to look this plant over. Address, 11 2 d LOCK BOX 277, Zanesville, Ohio.

WANTED.—Situation as general manager by a first-class Potter's Chemist with years of experience, understands all details of the business, can superintend and furnish formula's for the making of C. C. White Granite, Porcelain, Vitrified and Bone China, also all kinds of colored glazes for tile and brick. Bristol glazes for stoneware. Highest references furnished as to ability, etc. Address, 8 tf d m J. B., care Clay-Worker.

WANTED—A PARTNER.

A reliable party having a few thousand dollars to invest can secure an interest in an established clay machinery manufactory. Any one willing to take the active management of the business, will find it a profitable venture. For full particulars address 11 1 d PERSONAL, care Clay-Worker.

A BIG BARGAIN.

For sale cheap—a well-equipped brick plant in Northern Wisconsin; no other plant within 50 miles; clay burns red and there is an abundance of it; good railroad facilities, forty acres of clay land and large amount of timber suitable for fuel. A fine opportunity for a young brickmaker to start for himself. For full particulars, address 7 tf d WALLACE, care Clay-Worker.

NATIONAL BRICK AND QUARRY CO'S PLANT FOR SALE

By the assignee. Best plant in St. Louis; 153 acres land, unsurpassed clay, 12 houses, Triumph presses, Eudaly kilns, complete equipment; capacity 100,000 daily. Cost over \$125,000; bonded debt \$50,000. Large quarry. Must be sold very soon; subject to approval of court. Address at once, 11 1 d LEE MERNAGH, Assignee, Odd Fellows Hall, St. Louis, Mo.

WANTED—SECOND-HAND MACHINERY.

One 6 to 8 ton Locomotive.
Sixty side dump cars $1\frac{1}{2}$ to 3 cu. yds capacity.
One Dredge, 1 or $1\frac{1}{2}$ yds capacity.
Inside packed piston pumps, each 4, 6, 8 and 10 inches in diameter.
Large iron vertical pug mills.
Large Bucket, Pan, Belt and Screw, Conveyors and Elevators.
Large disintegrating or disk mills.
3000 feet of each 4, 6, 8 and 10 inch heavy cast iron water pipe.
Two 600 bbl water tank.
3, 4 and 5-inch steel shafting and hangers.
Large heavy grinding rolls and screens.
Water tube boilers and a large Corliss engine.
Angle and corrugated iron for building purposes.
10 Roof trusses, 60 ft span. Address 11 1 d CEMENT, care Clay-Worker.

**In Clay Working Machinery,
More than any other almost,
The Best is the Cheapest in the end.
We make a full line of
Dry Pans and Wet Pans
Of any desired Capacity.
Also Engines, Boilers, Pumps, Dump Cars,
Hoisting Machinery, Clay Elevators
And all Brick and Tile Supplies,
Of unequaled wearing quality.
Don't fail to get our prices.
THOS. CARLIN'S SONS, Allegheny, Pa.**

S. GEYSBEEK, Zanesville, Ohio.

Ceramic Chemist,

SPECIALTIES:—Analyzing clays, bodies, glazes and all Ceramic materials and products. Adjust bodies and glazes on every pottery line. Formulas for bodies and glazes for Pottery, Roofing Tile, Brick and Terra Cotta.

Suggestions and conclusions from analysis and pyrometric tests given free of charge. JUST DROP A LINE, LET ME KNOW YOUR TROUBLES AND I WILL ADVISE YOU.

FIRE

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

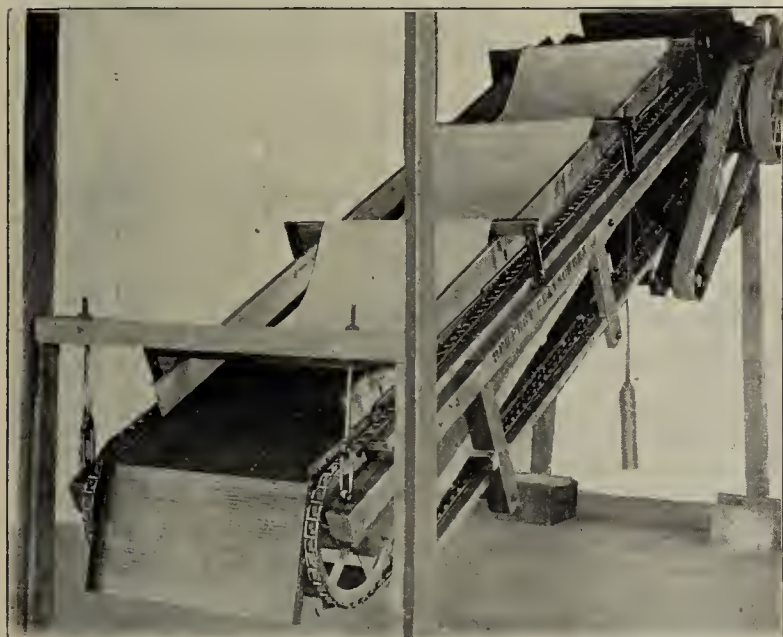
We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years.

Write for prices.

EVENS & HOWARD,

920 Market Street, - - - ST. LOUIS, MO.

The PERFECT CLAY SCREEN.



HAS NO EQUAL.

Always clean.
Perforations always open.
Separates the clay to full size of perforation.
It is simple, durable and effective.
Impossible to clog or paste it over.
Especially adapted to moist clay.
Purchaser takes no risk.
Satisfaction guaranteed or no pay.
Write us for full information.

Elder & Dunlap,
Bloomington, Ill.

Standard Dry and Wet Pans

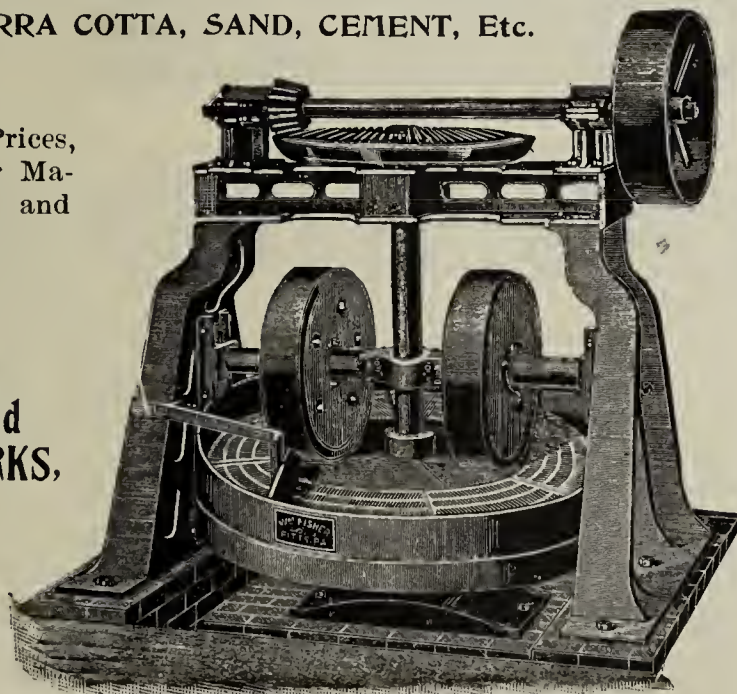
For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

**FISHER ENGINE
FOUNDRY and
MACHINE WORKS,**

Phillips & McLaren,
Proprietors,

24th and Smallman Sts.,
PITTSBURG, PA.



MENTION THE CLAY-WORKER,
WHEN WRITING TO ADVERTISERS,
MENTION THE CLAY-WORKER.

SITUATION WANTED—As business manager or salesman for manufacturer of front brick. Have had over ten years' experience as a dealer. Am thoroughly up in selling and handling all makes of pressed, repressed and enameled goods, and large acquaintance with architects over the country. Address
C. B. A., care Clay-Worker.

FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade. First-class references. Address
101 d
SUPERINTENDENT.
Care Clay-Worker.

A VALUABLE CLAY PROPERTY TO BE HAD AT A BARGAIN.

The advertiser offers upon favorable terms a location in northwestern Pennsylvania for making fire, building and vitrified paving brick, flooring, roofing and drain tile, sewer pipe and terra cotta in all its branches, and, in fact, all clay products except pottery. Twelve different kinds of fire clay and shale, in inexhaustible quantities, are on the property, burning white, buff, pink, salmon and red in color. On the property are also from twelve to fifteen million tons of bituminous coal, which can be delivered to works along the railroad for 50 to 60 cents a ton. Shipping facilities are first-class. A set of twelve bricklets, showing color and quality, forwarded on application. One vein six feet thick burns a pure white brick, which does not shrink in burning, adapting it especially for making enameled brick and tile. Address
103 cm
"PENNSYLVANIA,"
Care Clay-Worker.

FOR SALE.

3-ton Trenton Iron Co. incline hoist for conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, 1/2 screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
1 Barr Pumping Company steam pump.
1 Chambers Bros. Company brick machine.
All new or little used, and in excellent condition.
10 tf d
WALNUT,
Care Clay-Worker.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.
NEW YORK.

Sole Importers in the United States of the

Precipitated  Carbonate of Barytes

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.

Manganese.

From Producer to Consumer.

For Brick, Tile, Terra Cotta and Pottery Makers.

PULP, POWDERED OR GRAIN.

Samples and Prices on Request.

KENDALL & FLICK,

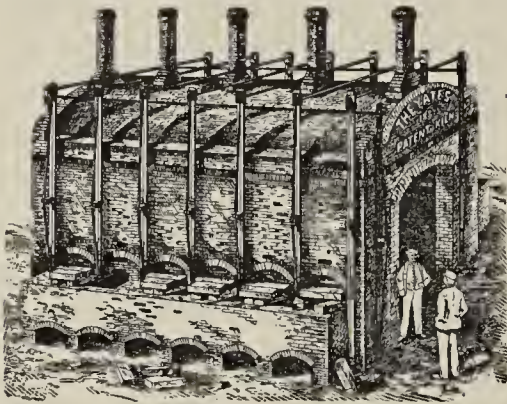
MINES AND WORKS IN VIRGINIA.

OFFICE:

618 Penna. Avenue N. W.,
WASHINGTON, D. C.

Booklet on the use of this material free.

GEO. S. COX'S
Ready Made
Cutting Wires,
 Always give Satisfaction.
 EAST LIVERPOOL, OHIO.
 Send for Samples and Prices.



For Economy of Fuel and Percentage of Hard Burned Brick.

This kiln has no equal, I will be glad to tell you all about it.

ALFRED YATES, Johnsonburg, Penn.

AN IMPROVED MUFFLED KILN

For Burning Terra Cotta, Fine Front Brick, Enameled Brick, Encaustic Tile, etc., etc.



THIS IS the best and cheapest kiln in the long run. It is guaranteed to do its work in a perfect and even way. There is no loss in burning with this kiln. Every piece put in comes out perfectly burned, whether set in top or bottom. We have had many years' experience in building terra cotta, brick and tile kilns of different kinds, and can guarantee successful and satisfactory results, being practical kiln builders. Our terms are reasonable. Write for particulars, stating character and capacity of kilns desired.

F. HUNDT & CO.,
 801 North Winchester Ave., Chicago, Ill.

The F. F. V. Vestibule Limited via the Chesapeake & Ohio R'y, is the only Solid train with through Dining Car between New York, Philadelphia, Baltimore, Washington, Cincinnati and the West. Lighted with Electricity. Heated with Steam.
 C. B. RYAN,
 H. W. FULLER, Ass't Gen'l Pass. Agent.
 Gen'l Pass. Agent, CINCINNATI, OHIO
 WASHINGTON, D. C.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in United States, Canada and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. }
 Marietta, Pa.

Chenoa, Ill.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

F. H. C. MEY,
Chain Belting Engineering Works,

Approved Appliances for
 Elevating, Conveying and Transmission of Power,
 64 to 68 Columbia St., BUFFALO, N. Y.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



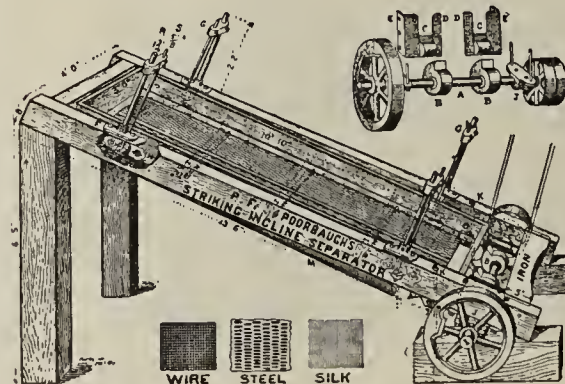
MEY PATENT CLAY ELEVATOR.

Make
 Many More
 Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

STRIKING INCLINE SCREEN



For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.

These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the

THE PITTSBURG MINERAL SCREEN CO.

Write for Prices.

PITTSBURG, PA.

The Run Easy Kind.

Walworth Run Foundry Co.,
CLEVELAND, OHIO.

Conveying, Elevating and... Power-Transmitting Machinery.

H. W. CALDWELL & SON CO.

Specialties for Handling
Material of
all Kinds. C A A I

GENERAL MACHINISTS,
127, 129, 131, 133 West Washington St..

CALDWELL
Steel Conveyor.
Manufactured exclusively by us at Chicago, with latest
Improvements.

Send for Catalogue.



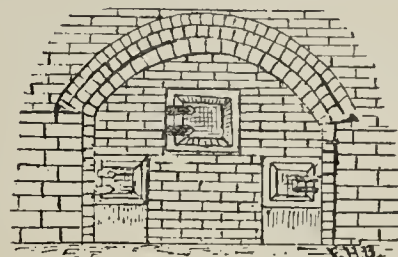
CALDWELL-AVERY SEAM-
LESS STEEL ELEV-
ATOR BUCKETS.

**LINK BELTING.
SPROCKET WHEELS
COTTON BELTING.
RUBBER BELTING.
LEATHER BELTING.
BELT CLAMPS.
ELEVATOR BOLTS.
ELEVATOR BUCKETS.
CONCRETE MIXERS.
FRICTION CLUTCHES.
JAW CLUTCHES.
COUPLINGS.
FLEXIBLE SPOUTS.**

OEARINO (all kinds.)
 ELEVATOR BOOTS.
 HANOERS.
 PERFORATEO METALS.
 PILLOW BLOCKS.
 IRON PULLEYS.
 WOOD PULLEYS.
 SHAFTHING.
 SET COLLARS.
 SWIVEL SPOUTS.
 TAKE-UP BOXES.
 TURN HEAD SPOUTS.
 WIRE CLOTH.



Swift's Kiln Furnace,



F. E. SWIFT'S PATENT SLACK COAL COKER,
GAS GENERATOR AND SMOKE CONSUMER.

CAN BE ATTACHED to any kind or style of Up or Down-Draft kiln. Nothing but slack or waste coal used from start to finish of burn.



Fires not disturbed but once in 10 hours till water smoke is off. Guaranteed to water-smoke dry press brick or the tenderest of clays or ware of any kind without damage. These furnaces can be seen in operation at my works at all seasons burning drain tile in winter and brick in Summer. It will pay you to investi-

gate—I can save you good money.

For further particulars, address

F. E. SWIFT,
Washington, Iowa.

The Keystone Brick Yard Supply Co.,

**Office and Works: 240 Arch Street,
LANCASTER, PENN.,**

MANUFACTURERS OF

Machine Brick Moulds

a Specialty.

With the latest improved machinery, and the best of skilled help and the very best material we are enabled to furnish moulds better and cheaper than any other make. Please let us know what you may want and receive some interesting prices.

Common Brick Moulds 5 or 6 Brick.....	\$1.75
Iron Lined heads " " " " "	2.10

Write for special discount on
all orders after July 1.



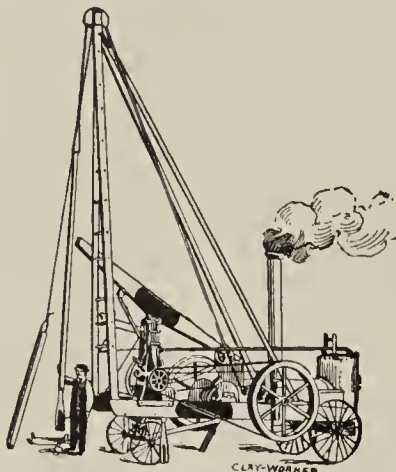
COLORIFIC.

For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of
WESTBROOK & WELLS,
Ogdensburg, N. Y.

W. R. Osborne,

Contractor for

Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,
PERTH AMBOY, N. J.

Steubenville Foundry & Machine Works,

Established in 1820.

—Manufacturers of—

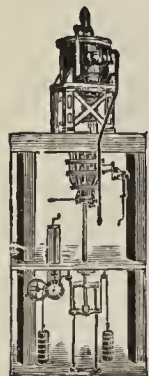
STEAM SEWER PIPE PRESSES

OF DIFFERENT SIZES,

Making From 2 to 30-Inch
Pipe Inclusive.

Pipe, Brick, Tile, Coping,
Fire Proofing, and
Building Block Dies.

Clay Grinding and Tempering
Pans and Pug Mills.



FEED
SCREWS
FOR
MINING
CLAY.



STEAM
———
ENGINES



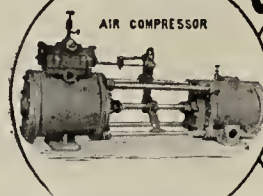
———
AND

Every Variety of Iron and Brass Castings
Shafting and Pulleys.

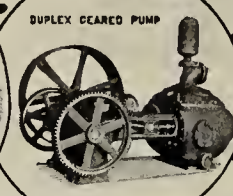
Send for Circulars and Estimates.

JAS. MEANS & CO.,
Steubenville, Ohio.

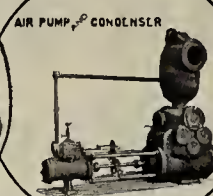
DEAN BROS' STEAM PUMP WORKS.



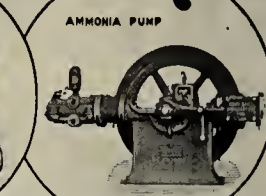
AIR COMPRESSOR



DUPLEX GEARED PUMP



AIR PUMP & CONDENSER



AMMONIA PUMP

PUMPING MACHINERY
FOR ALL PURPOSES

INDIANAPOLIS, IND.

SEND FOR CATALOGUE
AND PRICES

Dry Pan Clay Crushers.

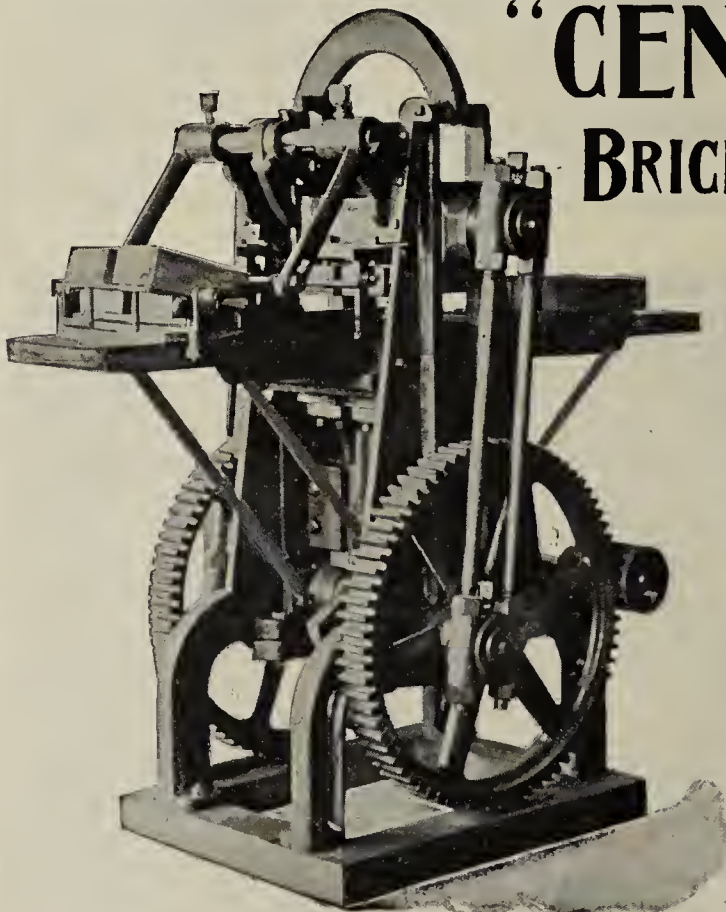
CLAY SCREENS AND ELEVATORS.

....

Eagle Iron Works,

Des Moines, Iowa.

"CENTRAL" BRICK REPRESS.



This cut shows our double die machine, which is acknowledged to be the simplest and best repress on the market.

It is no experiment, having been in use over two years with best results. Will do same work as others of twice the size and cost.

For particulars address

**Central
Machine
Works,**

236 Abbey Street,
Cleveland, Ohio.

We furnish all supplies and repairs for any make of the "SWORD" Brick machine.

Mention the CLAY-WORKER,
WHEN WRITING TO ADVERTISERS
Mention the CLAY-WORKER

Do You Want

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKMAN ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS,
ESTABLISHED NINE YEARS. Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,

Clarksburg, W. Va.

Fourteen (14) sold already this Season.

"LEVIATHAN."

"Upon Earth There is not His Like."



.....Sept1896.
MAIN BELTING CO.,
55 and 57 Market St., Chicago, Ill.
GENTLEMEN:—Please ship us via freight, 146 feet x 18" 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige. Yours very truly,

Manufactured under Special Process.
A Guarantee of Superiority.

NOTE.—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

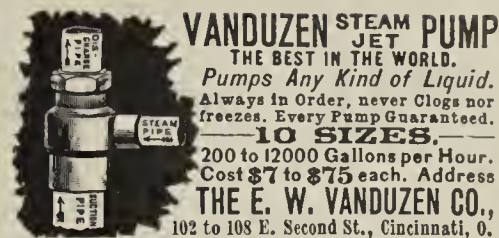
MAIN BELTING COMPANY,

Sole Manufacturers LEVIATHAN BELTING,

55 and 57 Market St., CHICAGO, ILL.

PHILADELPHIA: 1219 Carpenter Street.

BOSTON: 120 Pearl Street.



VANDUZEN STEAM JET PUMP
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
Always in Order, never Clogs nor freezes. Every Pump Guaranteed.
10 SIZES.
200 to 12000 Gallons per Hour.
Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
102 to 108 E. Second St., Cincinnati, O.

Davis's Brick, Tiles and Terra Cotta. Third Edition. Revised, Improved and Enlarged.

RECENTLY PUBLISHED.

A Practical Treatise on the Manufacture of Brick, Tiles and Terra-Cotta

Including Stiff Clay, Dry Clay, Hand-made, Pressed or Front, and Roadway Paving Brick, Enamelled Brick, with Glazes and Colors, Fire Brick and Blocks, Silica Brick, Carbon Brick, Glass Pots, Retorts, Architectural Terra Cotta, Sewer Pipe, Drain Tile, Glazed and Unglazed Roofing Tile, Art Tile, Mosaics, and Imitation of Intarsia or Inlaid Surfaces. Comprising every product of Clay employed in Architecture, Engineering and the Blast Furnace. With a Detailed Description of the Different Clays employed, the Most Modern Machinery, Tools and Kilns used, and the Processes for Handling, Disintegrating, Tempering and Molding the Clay into Shape, Drying, Setting and Burning. By Charles Thomas Davis. Third Edition. Revised and in great part rewritten. Illustrated by 261 engravings. 662 pages, 8vo. Price\$5.00

This volume will be sent by mail to any address in the world, or delivered by express C. O. D., freight paid, to any address in the United States for \$5.00.

A circular of eight pages, with specimens of the illustrations, showing the full Table of Contents, will be sent free to any one furnishing his address.

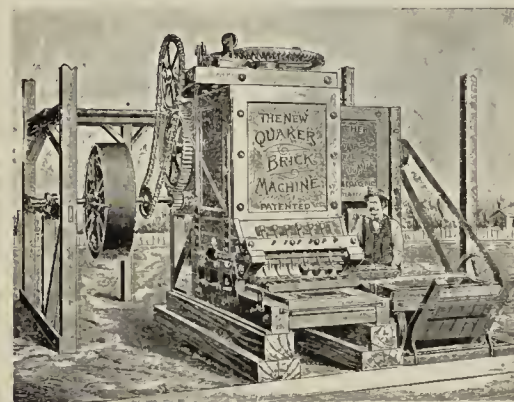
HENRY CAREY BAIRD & CO.

Industrial Publishers, Booksellers and Importers,
810 Walnut St. PHILADELPHIA, PA., U. S. A.

Soft Mud Brick Machinery

THE BEST FOR THE LEAST MONEY.

A complete combined outfit consisting of the Extra Heavy Quaker Spiral Pug Mill and Mould Sand-



ing Machine, capacity 40,000 or more per day. We carry in stock a full line of first class brickyard supplies at a very reasonable price.

Send for Catalogue.

James W. Hensley,

General Agent,
Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

M. V. B. WAGONER'S SLIP CLAY { For Glazing of Pottery } WORKS

ESTABLISHED 1845.

Clay in stock in any quantity, in barrels and bulk by the carload.

Office, 20 Ten Broeck St., ALBANY, N. Y.

A. F. TENNILLE'S

Bureau of

News and Legislative Information,

Congressional, Financial and Commercial. Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.

BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.

What do YOU know about

Bricks, Tiling, Pottery?

WE know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business on our road.

For particulars write

J. ST. KOWSLOWSKY,

or Industrial Agt., St. Louis, Mo.

E. W. LABEAUME,

G. P. and T. A., St. Louis, Mo.

Solid Train Between
Sandusky and Peoria—AND—
INDIANAPOLIS and
MICHIGAN CITY,
FT. WAYNE and
CONNEERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger.....	7:00 a. m.
*No. 22 Passenger.....	1:20 p. m.
No. 24 Passenger.....	7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger.....	10:20 a. m.
No. 23 Passenger.....	2:50 p. m.
No. 25 Passenger.....	6:20 p. m.
*Daily.	

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on

A. H. SELLARS, Agent,

Lake Erie & Western R. R.

C. F. DAILY, Gen. Pass. Agt.

INDIANAPOLIS, IND.

GEORGE A. MOSHER,
President.JAMES A. BUCK,
Vice-Prest. and Gen. Man.LE ROY VERMILYEA,
Secretary and Treasurer.

The Buck Machine Company,

SOLE MANUFACTURERS OF

Champion Brick Mold Sanding Machines, COHOES, N. Y.

The above Company was duly incorporated on the 8th day of March, 1897, under the laws of the State of New York, with a capital of \$60,000, which has been fully paid in.

This company has acquired by purchase all the interests of J. A. Buck and others in the business of manufacturing Champion Brick Mold Sanding Machines heretofore conducted by him, together with all patents covering said machines.

Of these patents, No. 301,087 is the foundation patent on the feed-rack applied to a cylinder machine. Buck's title to this patent was fully sustained by the decision of the United States Circuit Court of Appeals filed December 8, 1896, which decision was affirmed January 25, 1897, and a motion for a rehearing of the case denied. From this decision there is no appeal, and the title to this patent cannot be disturbed.

Patent No. 499,206 was sustained by Judge Coxe of the United States Circuit Court in a decision filed February 6, 1897, wherein he also sustained Buck's title to said patent. This patent covers the yielding form of feed rack as used in the later Champion Sanders. On February 15, 1897, a decree of the Court was entered granting and injunction against the use of infringing machines.

A copy of these decisions will be sent by mail upon request.

Claims against users of infringing machines will be actively prosecuted.

This Company is now prepared to promptly furnish the latest and most approved style of Champion brick mold sanding machines.

These machines are guaranteed in every respect, and purchasers will be fully protected in their use.

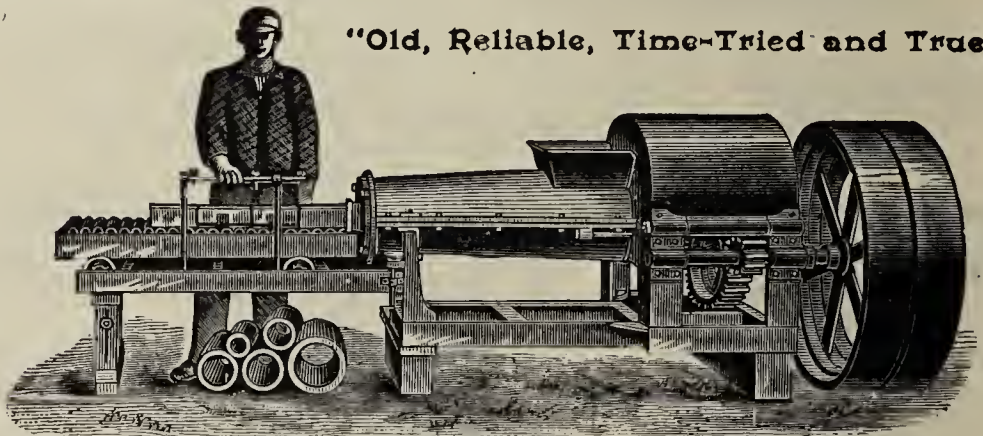
No agents should be recognized except those presenting credentials from this Company.

All communications, orders and payments should be made direct to

THE BUCK MACHINE COMPANY, Cohoes, N. Y.

KELLS & SON'S IMPROVED BRICK AND ... TILE MACHINES.

"Old, Reliable, Time-Tried and True."



P. H. Kells, the Original Inventor of the Auger Machine.

This machine works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the hacks and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. Patented June 22nd, 1880; and February 12, 1884. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

H. C. BAIRD & SON, PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

G. COLDEWE & CO.,

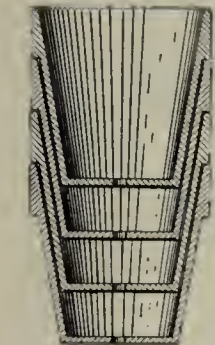
MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and.... MACHINE MOULDS

We manufacture the the most substantial Moulds known, and guarantee every floud to be first-class in material and workmanship.

A Special Discount on all orders received on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

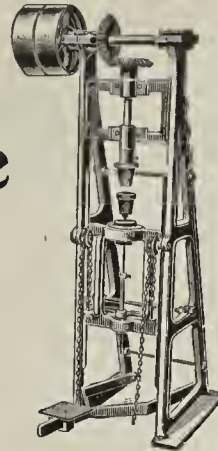
6,000 two-inch Pots; 3,500 five-inch Pots;
4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

INDIANAPOLIS, IND.



CHAMPION Brick Mould SANDING MACHINES.

This cut represents the latest improved Champion. No belts, apron or gearing. Simple, strong, and serviceable.

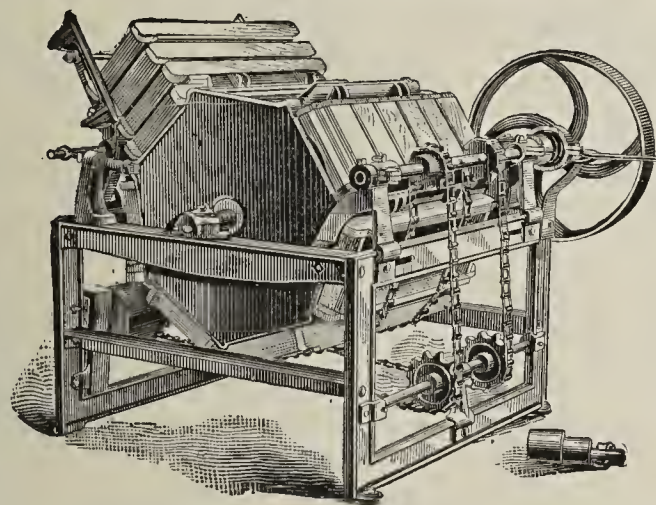
A. H. NEWTON,

Manager and Sole Agent,
HAVERSTRAW, N. Y.

THE case of Newton vs. Buck was decided March 16th, 1896 by Judge Cox holding that Newton was the owner of the patent 301,087 and had the exclusive right to manufacture machines under that patent, that Buck infringed it and should pay Newton damages and profits and cease manufacturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has reversed the decree, so that the whole matter will have to be re-tried, and a suit for that purpose has been commenced against Buck and is now pending in the United States Circuit Court for the Northern District of New York.

Only one patent No. 301,087 was involved in that decision and even if it stand, it only gives Buck the title to that one patent, while eight other patents, Nos. 281,115; 290,847; 385,790; 322,455; 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding machine can be made by Buck without infringing three or more of them. Suit has been commenced on these patents against Buck, and any persons purchasing from him or his agents will be prosecuted for infringement.



4000 TO 5500

(Gallons of Water per hour.)

BY HAND-POWER.

Pumps, Hand-power Pumps.

(LOUD'S PATENT.)

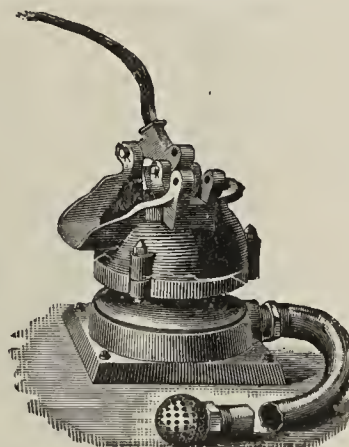
These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works, Sewer Contractors, Foundation Builders, Miners, Quarries or wherever it is desired to raise a large quantity of water by Hand-power. The pump has large valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



THE CENTRAL PASSENGER ASSOCIATION 1,000-MILE INTERCHANGEABLE REBATE TICKET

Is for sale at principal Ticket Offices of THE PENNSYLVANIA LINES.

It is honored one year from date of sale for Exchange Tickets over either of the following named Lines:

Ann Arbor,
Baltimore & Ohio,
Baltimore & Ohio Southwestern,
Chicago & Eastern Illinois,
Chicago & West Michigan,
Cincinnati & Muskingum Valley,
Cincinnati, Hamilton & Dayton,
Cleveland & Marietta,
Cleveland, Canton & Southern,
Cleveland, Cincinnati, Chicago & St. Louis,
Cleveland, Lorain & Wheeling,
Cleveland Terminal & Valley,
Columbus, Hocking Valley & Toledo,
Columbus, Sandusky & Hocking,
Detroit & Cleveland Steam Navigation,
Detroit, Grand Rapids & Western,
Dunkirk, Allegeny Valley & Pittsburg,
Evansville & Indianapolis,
Evansville & Terre Haute,
Findlay, Fort Wayne & Western,
Flint & Pere Marquette,
Grand Rapids & Indiana,
Indiana, Decatur & Western,
Lake Shore & Michigan Southern,
Louisville & Nashville (Between Louisville and Cincinnati and between St. Louis and Evansville),
Louisville, Evansville & St. Louis,
Louisville, Henderson & St. Louis,
Michigan Central,
New York, Chicago & St. Louis,
Ohio Central Lines,
Pennsylvania Lines West of Pittsburg,
Peoria, Decatur & Evansville,
Pittsburg & Lake Erie,
Pittsburg & Western,
Pittsburg, Lisbon & Western,
Toledo, St. Louis & Kansas City,
Vandalia Line,
Wabash Railroad,
Zanesville & Ohio River.

The price of these Tickets is Thirty Dollars each. They are not transferable. If the ticket is used in its entirety and exclusively by the original purchaser, a rebate of Ten Dollars is paid by the Commissioner of the Central Passenger Association.

E. A. FORD,
Pittsburg, Pa., Gen'l Passenger Agent.

STOP-LOOK LISTEN

THE POPULAR

MONON ROUTE
LOUISVILLE NEWALBANY SCHIESSER

IS THE BEST LINE TO

CHICAGO

TIME REDUCED TO 4 3/4 HOURS.

FOUR DAILY TRAINS

Leave Indianapolis	{ 7:00 a. m., 11:50 a. m. 3:35 p. m., 12:55 night
Arrive Chicago	{ 12:00 noon, 6:00 p. m. 8:20 p. m., 7:20 a. m.
Trains	{ 3:30 a. m., 7:45 a. m.
Arrive Indianapolis	{ 2:35 p. m., 4:37 p. m.

LATEST IMPROVED

VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant

PARLOR CARS AND DINERS

Local Sleeper in Indianapolis Ready at 8:30 p. m.
Leave Chicago, Returning, at 2:45 a. m.
Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: 2 West Washington St.,
Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.

VANDALIA LINE

The Short Line for

ST. LOUIS AND THE WEST.

LEAVE INDIANAPOLIS,	AR. TERRE HAUTE	AR. ST. LOUIS.
* 7:20 am	10:05 am	.....
* 8:10 am	10:15 am	3:15 pm
* 12:40 noon	2:35 pm	7:12 pm
* 7:00 pm	9:04 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am
*Daily.		

All trains carry first-class coaches. 12:40 noon train has Parlor and Dining Cars for St. Louis. 11:20 pm train has local sleeping cars starting from Indianapolis for Evansville, and St. Louis, open every night at 8:30. All trains enter the Union Passenger Station at Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46 Jackson Place and Union Station.

W. W. RICHARDSON, Dis. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present site, or if you are not doing quite as well as you would like to, why not consider the advantages of a location on the Illinois Central R. R. or the Yazoo & Mississippi Valley R. R.? These roads run through South Dakota, Minnesota, Iowa, Wisconsin, Illinois, Indiana, Kentucky, Tennessee, Mississippi and Louisiana, and possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS

MANY KINDS OF RAW MATERIAL

For full information write the undersigned for a copy of the pamphlet entitled

100 Cities and Towns **WANTING INDUSTRIES**

This will give you the population, city and county debt, death rate, assessed valuation of property, tax rate, annual shipments, raw materials, industries, desired, etc.

To sound industries, which will bear investigation, substantial inducements will be given by many of the places on the lines of the Illinois Central R. R., which is the only road under one management running through from the Northwestern States to the Gulf of Mexico. GEO. C. POWER, Industrial Commissioner I. C. R. R. Co., 506 Central Station, Chicago.

TAKE THE
BIG 4
TO
ST. LOUIS

MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers
... of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequaled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Elevators

For handling

CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.

Also Furnish

RUBBER,
LEATHER,
COTTON
BELTING.

JEFFREY

Roller, Steel and Special CHAINS
—FOR—
**ELEVATING
CONVEYING
MACHINERY**
FOR HANDLING MATERIAL OF ALL KINDS.

Power Transmission Machinery.
COAL MINING MACHINERY.

**WIRE CABLE
CONVEYORS.**
For long and short distance conveying.

THE JEFFREY MFG. CO., Columbus, Ohio.
Send for Catalogue. 163 Washington St., New York.

Conveyors.

Manufacture
SHAFTING,
PULLEYS,
HANGERS,
GEARS,
CLUTCHES,
BUCKETS,
BOOTS,
BOLTS,
Etc...



OLD SHELDON WHISKEY



COVINGTON,
KENTON COUNTY,
KENTUCKY.



The Peerless Whiskey of America for Medicinal and Family Use.
Thoroughly Matured, of Rich, Natural Flavor, and absolutely Pure.

Sold Direct to Consumers AT DISTILLER'S PRICE.

NO MIDDLEMAN. NO COMMISSION. NO FREIGHT.

As a Trial, we will send Express Prepaid, (boxed, no marks),
One Gallon of ten-year-old (Spring 1888)

Sheldon Rye Whiskey for \$3.90, or five quart bottles for \$5.

Money returned if not perfectly satisfactory. Price List mailed free.

Address **THE SHELDON DISTILLERY CO., Covington, Ky., U. S. A.**

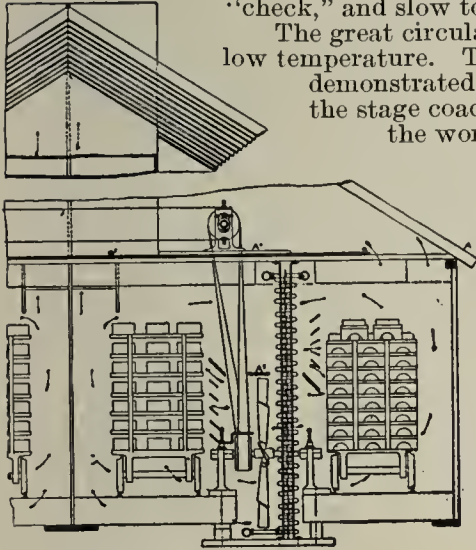
Patronized by the Medical Staff of the United States Army and Navy.

FIVE QUART
BOTTLES FOR \$5.00
Delivered Anywhere.

Mention the CLAY-WORKER,
When writing to Advertisers
Mention the CLAY-WORKER.

Still Further Testimony!

Soft Mud Brick Dried in 10 or 12 hours.



The INSIDE FAN DRYER.

U. S. Pat. Mar. 31, 1891. No. 449,170.
U. S. Pat. Mar. 31, 1891. No. 449,231.
British Pat. Mar. 31, 1891. No. 5,520.
Canadian Pat. May 30, 1892. No. 39,025.
Canadian Pat. May 30, 1892. No. 39,026.

You have the best drier in the market and I purpose in the near future to put in another two track section. Wishing you success, I am

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.
DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,
CHAMBERS BROTHERS CO.

J. H. CHAMBERS, Gen'l Mgr.

The fans save in cars, pipe and enclosure to make the first cost less than half that of other dryers, and in continuous use less than one-fourth of the fuel in using engine exhaust steam only for heating—much more of it, and without back pressure.

306 Hannah St., West, Hamilton, Ont. Can. }
July 10th, 1897. }

S. G. Phillips, Esq., Rahway, N. J.

Dear Sir:—I am pleased to reply that your little 12 feet x 5 1/2 feet, two track, drier has been in use by me since May 15th, 1897 and works remarkably well.

Our clay takes from six to eight days to dry on yard pallets and three or four days in a neighboring drier, yet the six or seven thousand large soft mud brick it holds on 16 cars are easily dried in 10 or 12 hours in a superior and most economical manner because of heating with the engine exhaust steam only.

The endless belts drive the 10-60in. diameter (inside volume) fans easily not appearing to cost over 6 or 7 h. p. at 360 turns per minute to fairly make the wind blow.

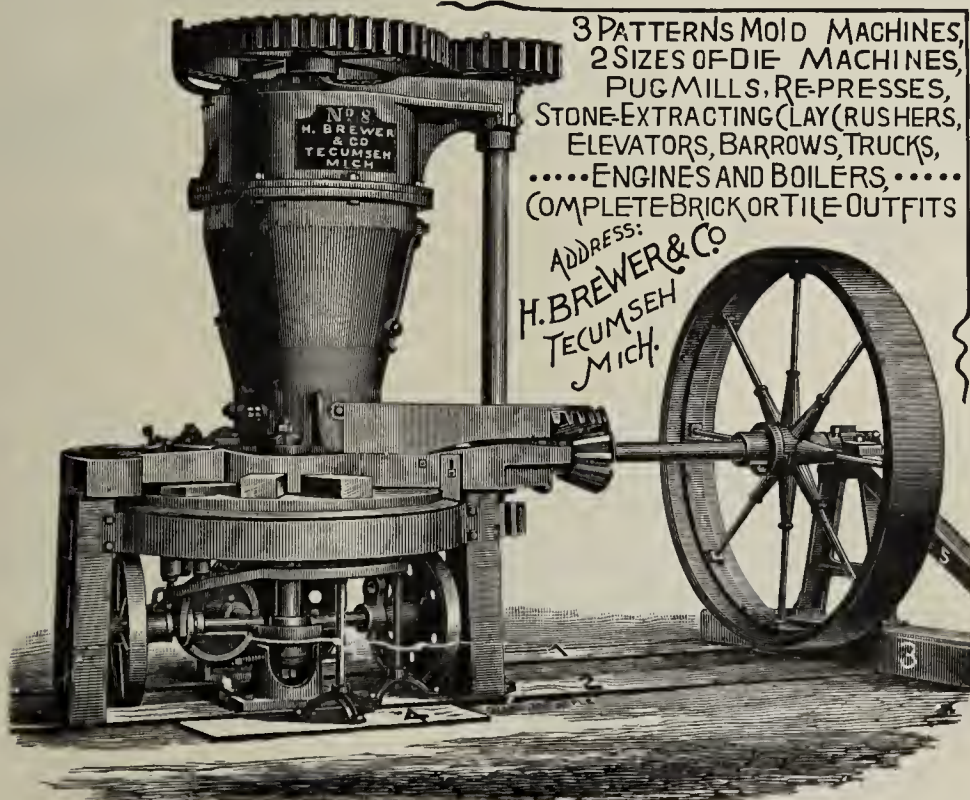
Yours truly,
JOHN W. FRID.

S. G. PHILLIPS.

Agent and
Patentee,

161 Grand Street.

Rahway, N. J.



3 PATTERNS MOLD MACHINES,
2 SIZES OF DIE MACHINES,
PUG MILLS, RE-PRESSES,
STONE-EXTRACTING (LAY) RUSHERS,
ELEVATORS, BARROWS, TRUCKS,
..... ENGINES AND BOILERS.
COMPLETE BRICK OR TILE OUTFITS

ADDRESS:
H. BREWER & CO.
TECUMSEH
MICH.

ARCHITECTURE

Architectural & Mechanical Drawing; Marine, Stationary and Locomotive Engineering; Sheet Metal Pattern Cutting; Plumbing; Electricity; Railroad, Hydraulic & Bridge Engineering; Surveying and Mapping; Book-Keeping; Shorthand; English Branches; Mining; Metal Prospecting; Machine Design. All who study

GUARANTEED SUCCESS.
Fees Moderate, Advance or Installments.
Circular Free; State subject you wish to study.
International Correspondence Schools, Box 958, Scranton, Pa.



Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD, JACKSONVILLE and HANNIBAL, MO.

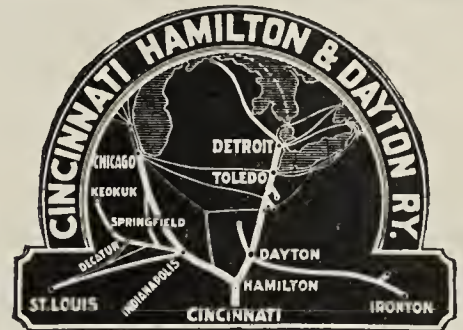
Through Sleeping Cars to St. Louis, Mo., via I. D. & W. Clover Leaf Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.	
Mail and Express.....	8.15 a m
Accommodation.....	3.45 p m
Fast Express.....	11.10 p m

ARRIVE.	
Fast Express....	3.35 a m
Accommodation	10.40 a m
Mail and Express.....	4.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



INDIANAPOLIS AND CINCINNATI LINE

6 Trains Daily. Parlor Cars and Cafe Dining Cars on day trains; Pullman, Compartment and Standard Sleeping Cars, and Chair Cars, also Wagner Sleeping and Chair Cars on night trains. Direct Connection made at Cincinnati without Omnibus Transfer, for all points

SOUTH and EAST

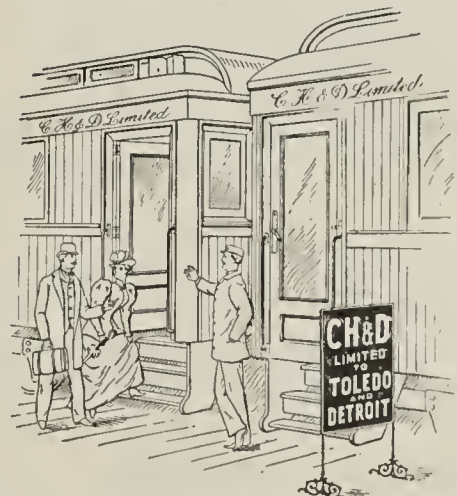
INDIANAPOLIS, TOLEDO AND DETROIT

The Michigan Line (via Hamilton.)

5 Trains daily to Dayton.
2 Trains daily to Toledo.
2 Trains daily to Detroit.

Observation, Vestibuled Coaches and Parlor Cars on Through Express Trains. Pullman and Wagner Sleeping Cars on night trains.

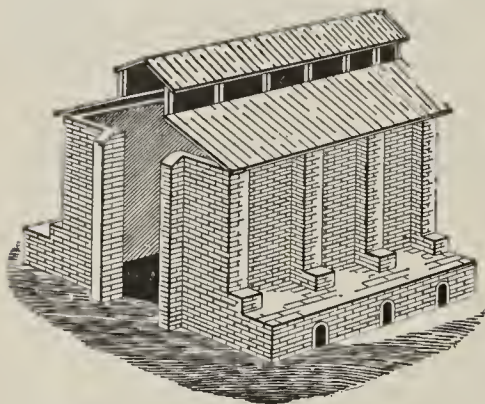
G. W. Hayler, D. P. A. } Indianapolis,
W. J. Nichols, T. P. A. } Ind.
D. G. EDWARDS,
Passenger Traffic Manager.



Mention the CLAY-WORKER

WHEN WRITING TO ADVERTISERS,

Mention the CLAY-WORKER.



Up-Draft Kiln.

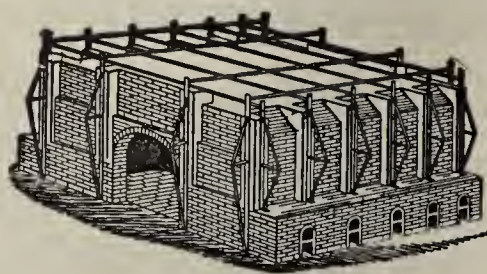
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET. The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 1,919 Indiana Ave., Kansas City, Mo.



Down-Draft Kiln.

ALSIP'S LATEST IMPROVED DOWN and UP-DRAFT KILN.

IS SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

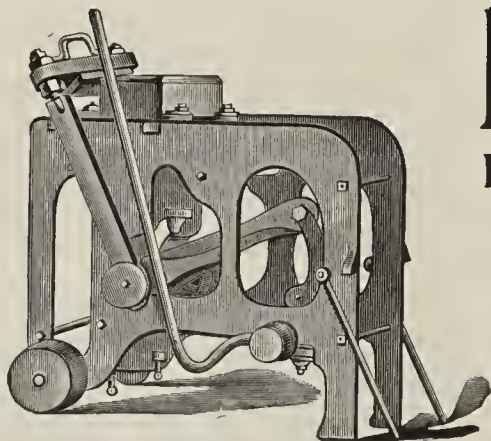
If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

Address, **S. H. ALSIP,**

Days Brick Yard.

BELLEVILLE, ILL.



RED BRICK PRESS.

GEORGE CARNELL,

Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,

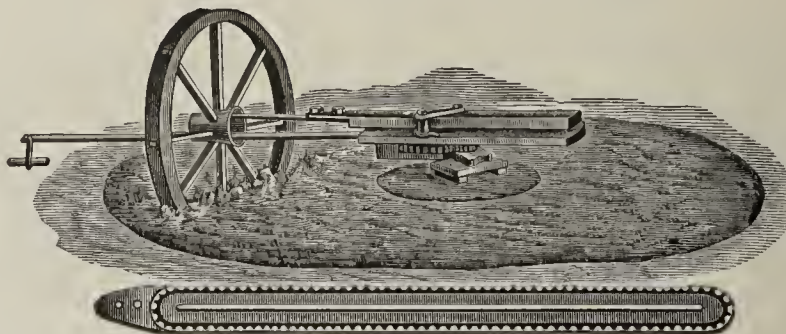
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

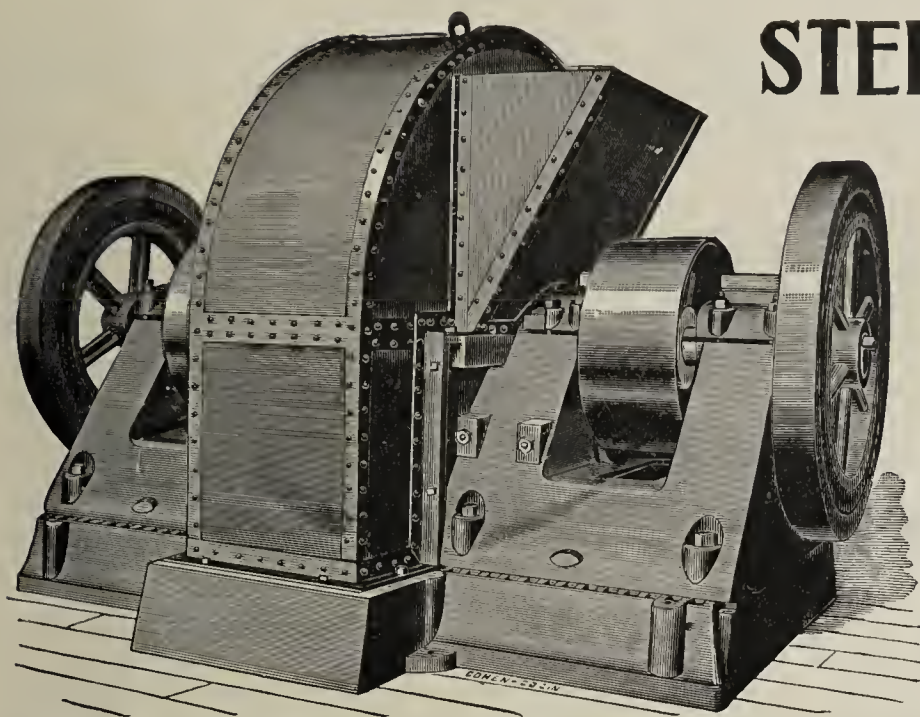
....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 15 per cent. cheaper.

Send for Circular and Price-List.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

Aurora, Ind.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.

The New South Brick Machinery

We don't claim the whole earth and don't want it, but our machines want large quantities of it. They are always hungry, and are never troubled with indigestion or constipation. No doctor bills to pay.

Cutting Tables, Clay Crushers Winding Drums, Clay Cars, Dryer Cars, Brick Trucks, Elevators.

GREENVILLE, S. C., Sept. 23rd, 1897.

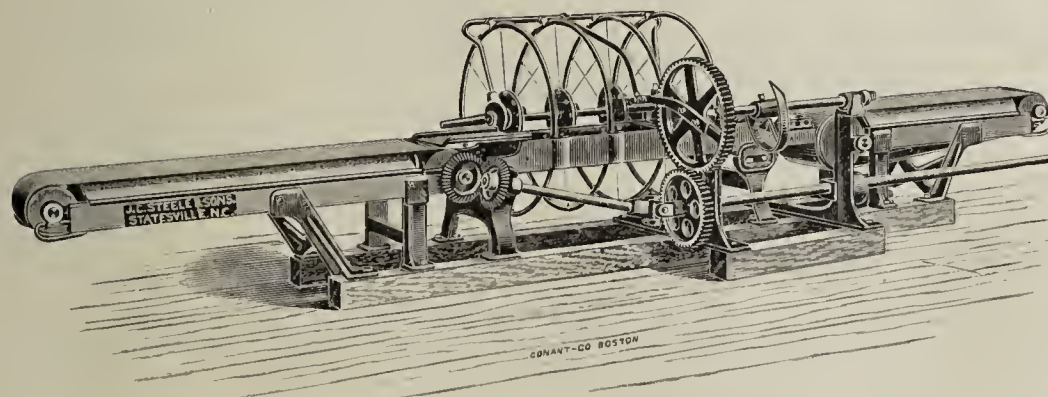
J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Since putting in your "Xtra" machine with automatic cutter I have the brick business of this city all to myself. I made 112 in one minute this morning, and can make 50 M any day of 11 hours. The bricks are dandies.

Yours very truly,
THOS. J. HANNON.

Mr. Hannon took out another machine that was almost new, and put in our "Xtra." We do not claim 50 M per day for this machine, but this is what our customers say that it will do.

Strictly modern machinery at the lowest price. Send for Catalogue.



Automatic Cutting Machine.

J. C. STEELE & SON, Statesville, N. C.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

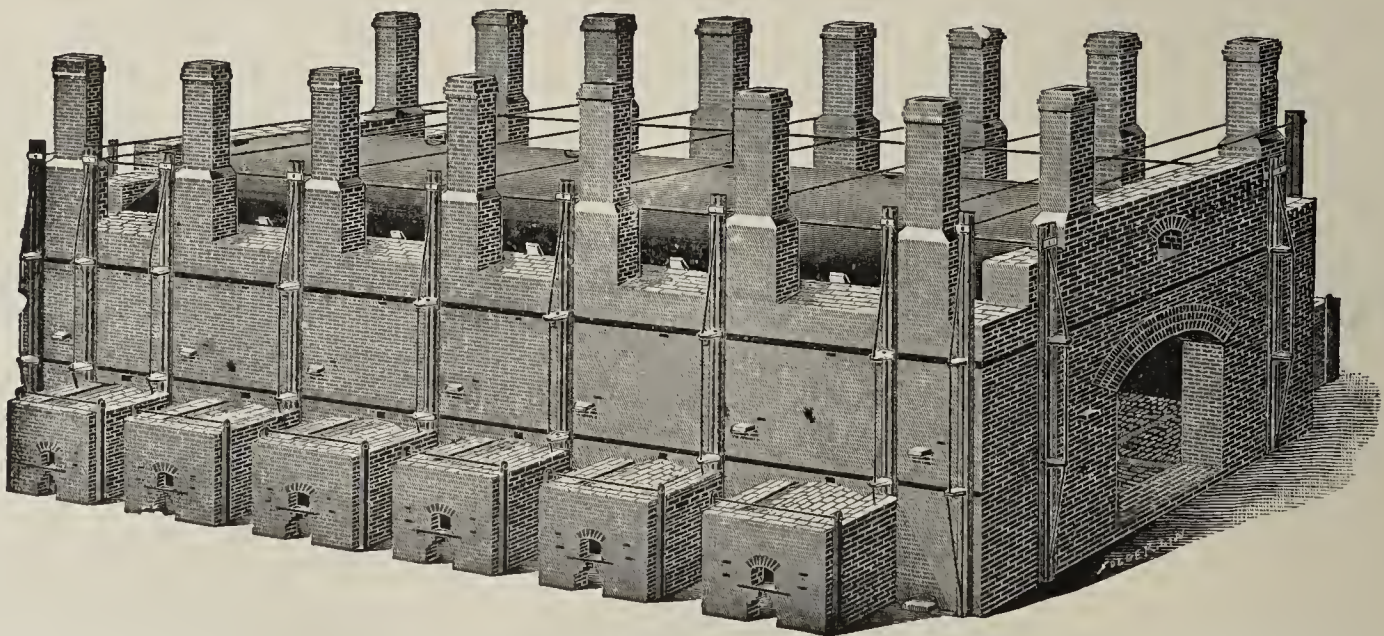
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.



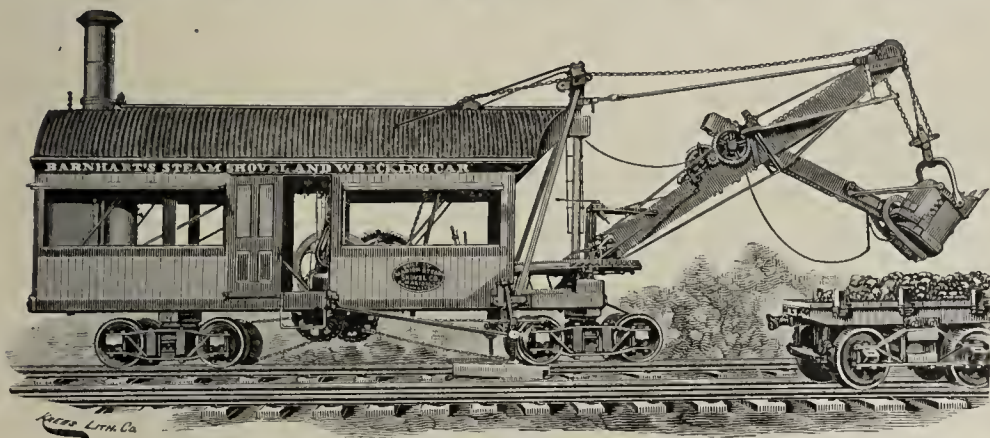
A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.

Steam Shovels for Brickyards.



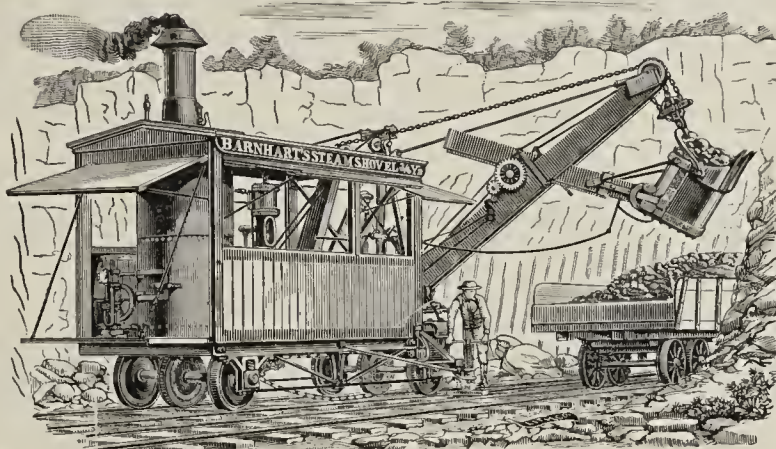
STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

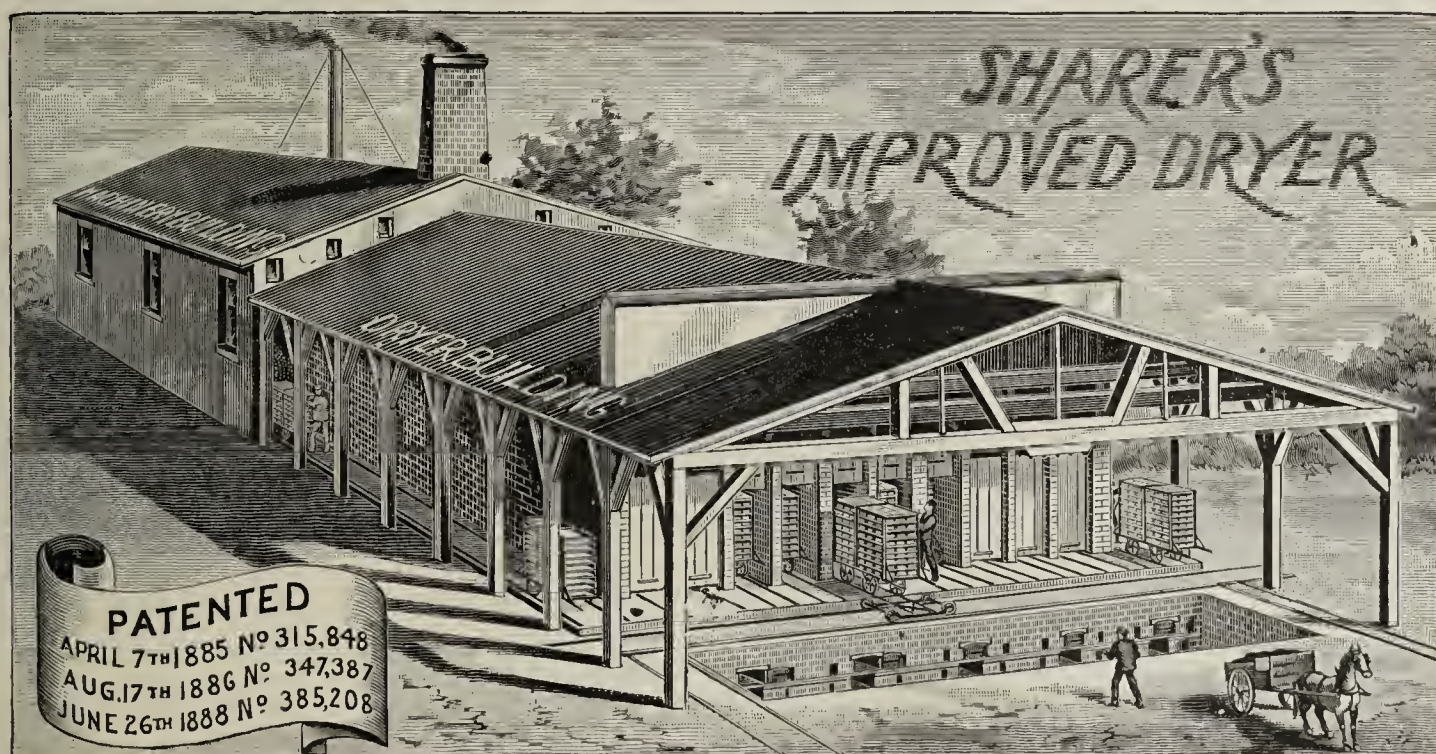
603 West Center Street, - **MARION, OHIO.**



STYLE C—¾ YD.

Geo. W. Sharer,

Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.



PATENTED
APRIL 7TH 1885 N° 315,848
AUG. 17TH 1886 N° 347,387
JUNE 26TH 1888 N° 385,208

COMPLETE Dryer and Kiln outfits, and Complete
Plants a specialty. Address

GEO. W. SHARER, 2224 Tioga, St. Philadelphia, Pa.

The Best of all Recommendations.

... A DUPLICATE ORDER. ...

(COPY)

Office of HYDRAULIC PRESS BRICK CO.,

St. Louis, Mo., October 14th, 1897.

Milton F. Williams, Esq., 2705 N. Broadway.

Dear Sir:—I am thinking of putting in two of your Disintegrators at one of our plants in the East, which is to be used to pulverize clay as it comes from the dryer, which discharges in a very uniform quantity per minute. The largest pieces are about the size of eggs, 75% of it is like corn or chestnuts. We want to pulverize all about the size of corn. It comes out hot, dry and regular.

How small a machine can I use to put through 140 tons in 10 hours? What size machine would you recommend, and about what will it weigh?

Yours truly,

HYDRAULIC PRESS BRICK CO.

W. N. Graves, Gen'l Supt.

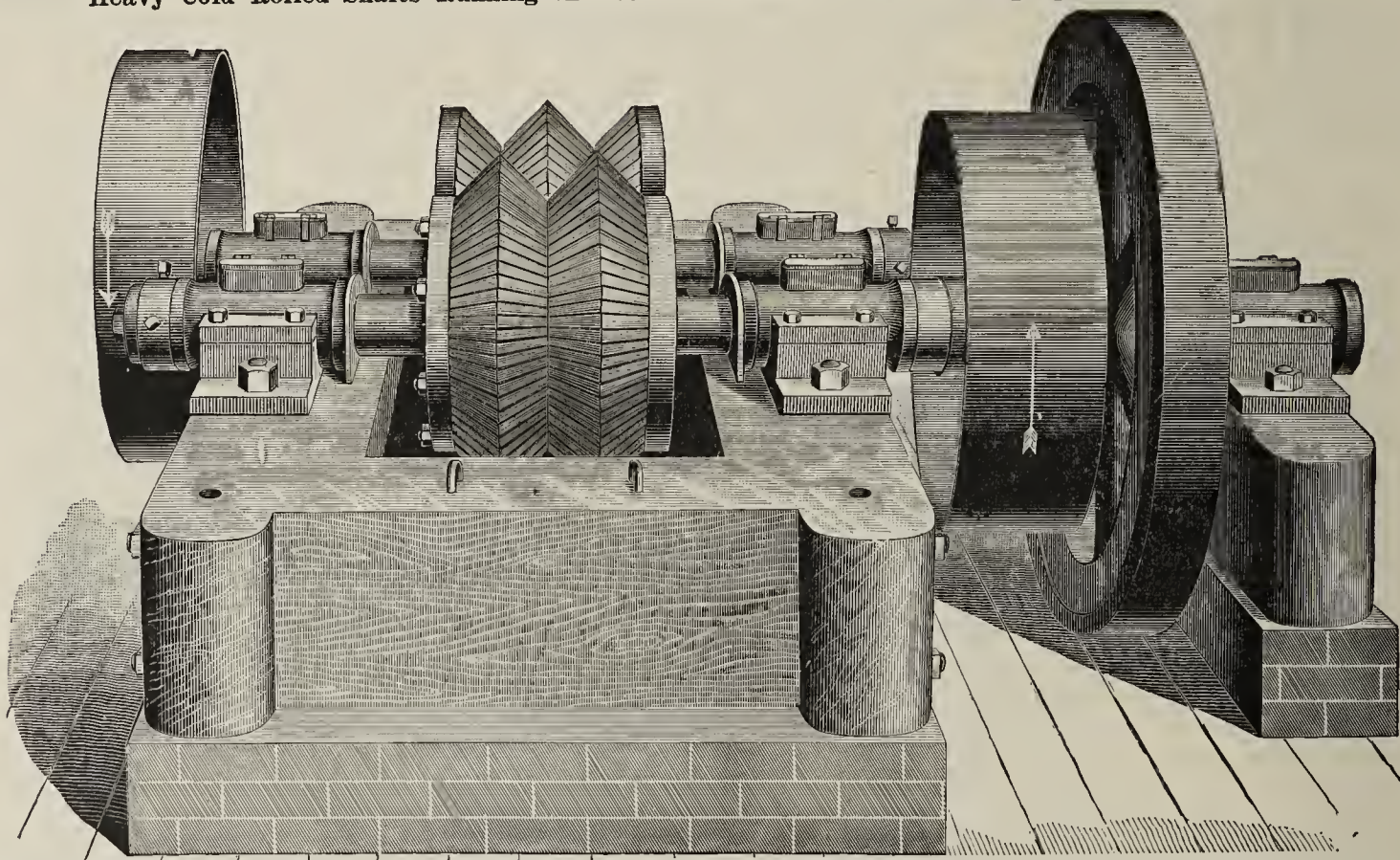
The above Company are using three of our Pulverizers, and have ordered three more, they state that in one of their St. Louis plants they are getting 210 tons of fire clay in 10 hours through one of our No. 2 extra Pulverizers. The Hydraulic Co. know a good thing when they see it, and are evidently making good use of same. Why not fall in line and do likewise?

The Williams Patent Crusher and Pulverizer Co., 2705 North Broadway, St. Louis, Mo.

Eastern Representative, GEO. W. BORTON, 700 Fidelity Bldg, Philadelphia, Pa.

NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.



Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building, New York, U. S. A.
26 Cortland and 21 Dey Streets,

Do You Want A BRICK MACHINE A DRY PAN A PUG MILL?

IF SO DON'T FAIL TO

Get
Our
Prices,



They
Can't
... be
Beat.

.....

WOOLLEY'S MACHINERY is built on mechanical lines and of the best material. Our "**Iron King**" is a non-breakable brick machine, built entirely of iron and steel. It will work any clay that is suitable for common brick. Let us tell you more of its points of superiority. It has many, such as great capacity and the get-at-ability of every part.

We also make **SLIP PUMPS** and **SLIP PRESSES** and other Tile and Pottery Manufacturers supplies.

It will afford us pleasure to correspond with you.

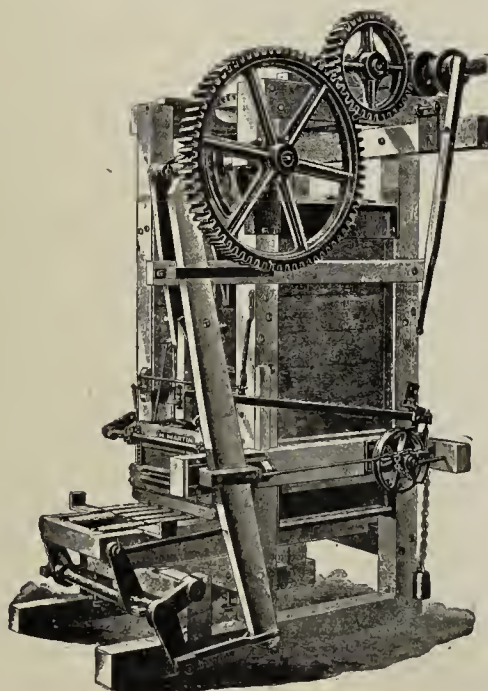
Mention the Clay-Worker

The "**HENRY MARTIN**" **BRICK MACHINES**

Are Manufactured **ONLY**

We carry in stock at all times
a large line of...

BARROWS,
TRUCKS,
MOULDS,
KILN CASTING and
General Brick Yard
Supplies.

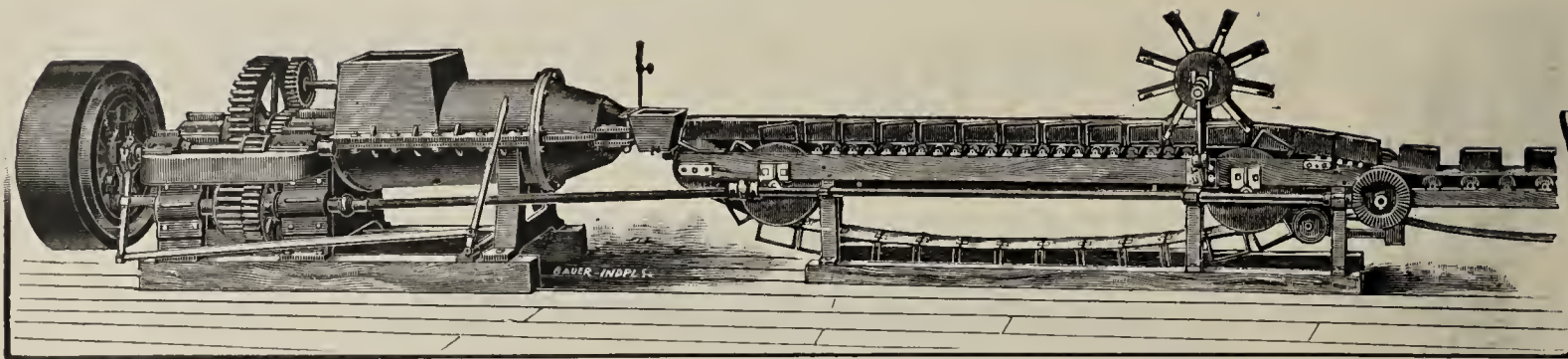


We are prepared to equip a
BRICKYARD complete,
and furnish the detail plans
for the entire construction
of the plant.

WRITE US for prices be-
fore purchasing elsewhere.

BY THE

HENRY MARTIN BRICK MACHINE MFG. CO., LANCASTER, PA., U. S. A.



DANVILLE, ILLS, August 12th, 1897.

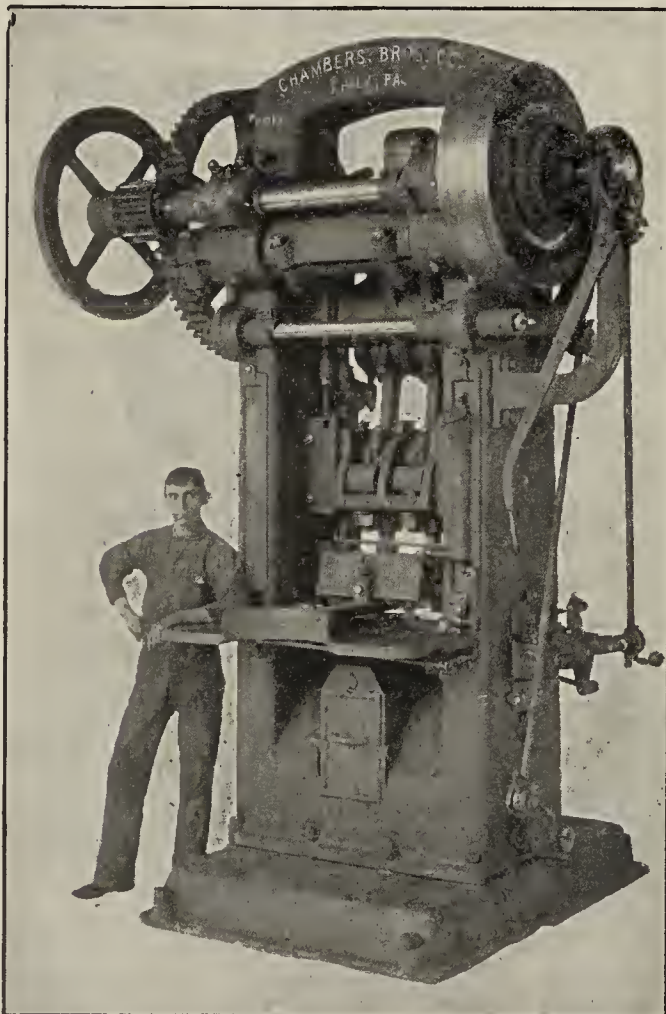
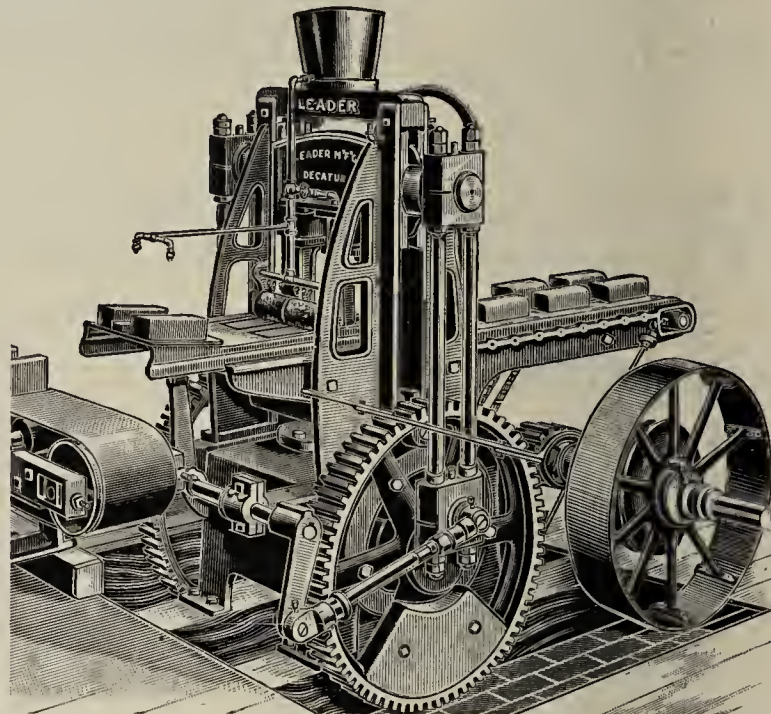
LEADER MFG. Co., Decatur, Ill.

Gentlemen:—We have been using two of your double power represses for nearly two years. Although the presses are in constant use (as we repress all of our product), we have had no trouble with them; both the quantity and quality of the work is entirely satisfactory. About three years ago we began with and used another make until we saw yours at work, when we substituted yours for the old ones, and we find we made a good investment. For strength, durability and simplicity we think THE LEADER RE-PRESS has no equal.

Yours truly, DANVILLE BRICK AND TILE CO.,
J. G. SHEA, President.

We have pleased several and can please you. Complete line of new, and bargains in second-hand machinery.

Leader Manufacturing Co.,
Decatur, Ill.



The Chambers Power Repress

...For Plastic Brick...

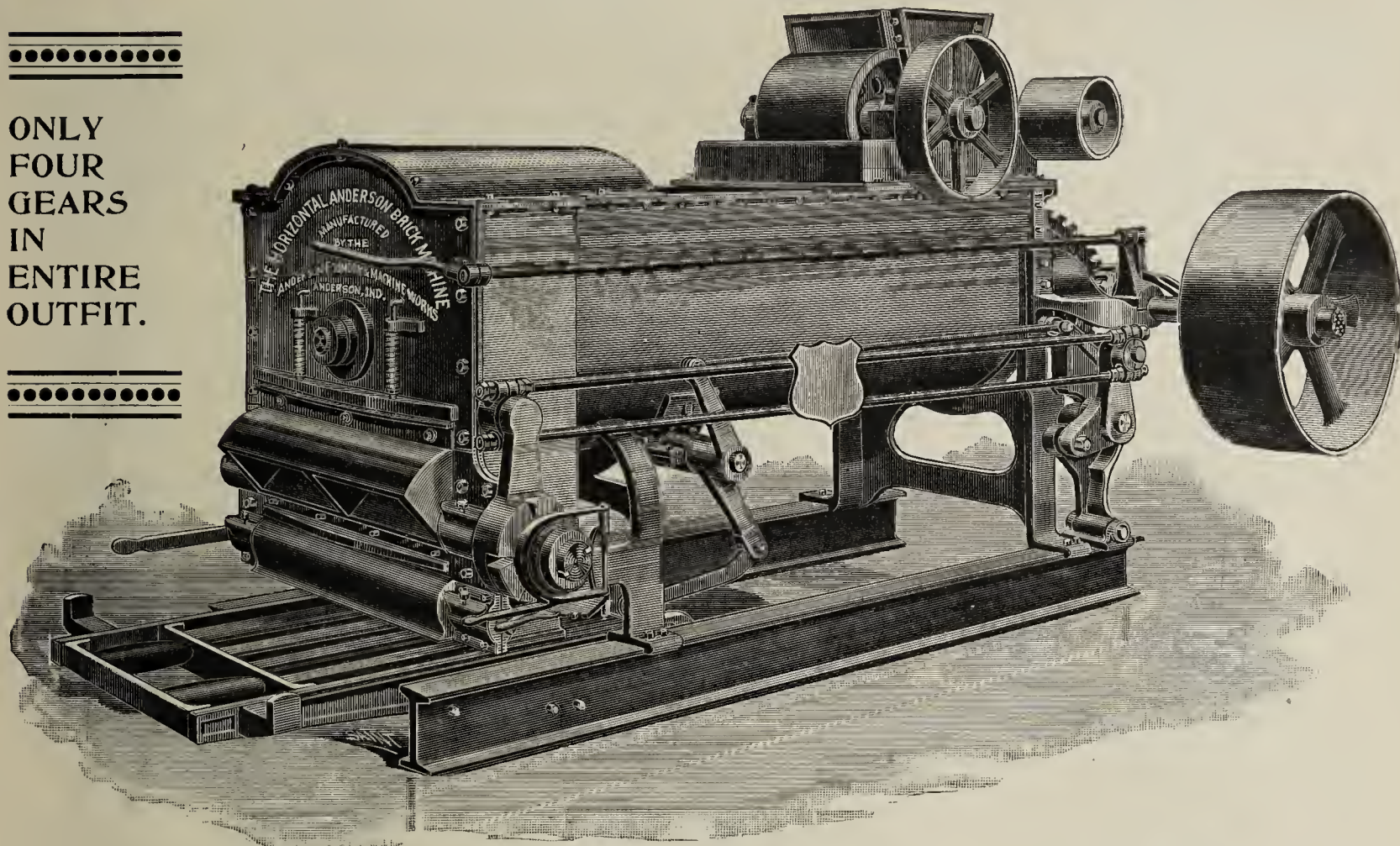
A STRONG, stiff, machine, with all the pressing machinery above the mould-box and away from the dirt. Steel-faced cams and hardened steel cam-rollers. Main shaft bearings made with long sleeves. Cross-head guides fitted with adjustable bronze gibs. The finished brick is delivered upon a plate, and is never touched by the incoming clot, which is placed in exact position and cannot be shaved. During the initial pressure any surplus clay in the clot is expelled, and all brick thus gauged to uniform thickness, following which all openings are closed and the finishing pressure applied in a practically tight box. The product is repressed, tempered clay brick, free from blemish arising from method of delivery, and of practically uniform density and thickness. The pressure applied to each brick can be regulated at will. **Weight about 14,000 pounds.**

Manufactured by **Chambers Bros.' Co.**
Fifty-Second St. Philadelphia, Pa.
Below Lancaster Avenue. U. S. A.

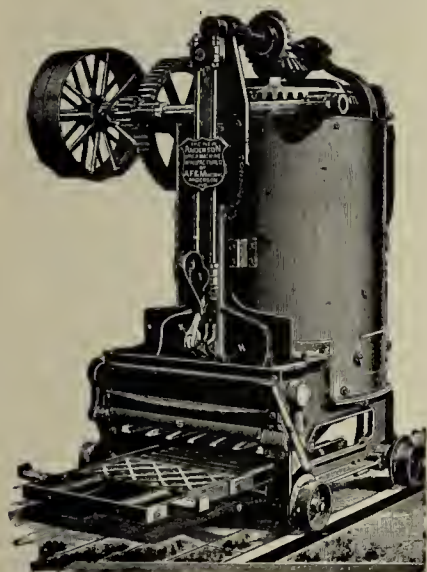
DON'T

Buy a Brick Machine until you Investigate the **HORIZONTAL ANDERSON**. The latest — the Strongest — Greatest Pressure and Puging Capacity.

ONLY
FOUR
GEARS
IN
ENTIRE
OUTFIT.

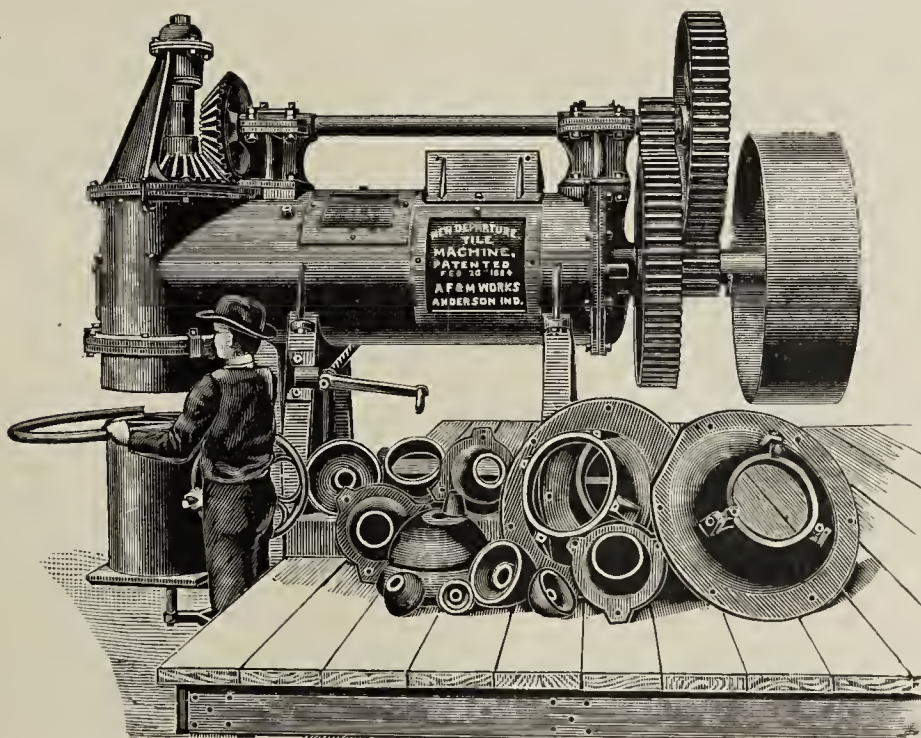


Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

The NEW DEPARTURE TILE MILL.

The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

Anderson, Indiana

Good Opinion

Of an Ex-President of the N. B. M. A., and "Brickmaker to the President of the U. S."

This letter is only one of many received of the kind. Once you have used a **POTTS HORIZONTAL STOCK BRICK MACHINE**, you would not use any other if it were given to you.

OFFICE OF
ADAMS BRICK CO.,
Builders Exchange.

Manufacturers of Building, Sewer and Paving Brick.
Made from Shale or Clay.

WORKS:--Martinsville, Ind.

Indianapolis, Ind., Oct. 5th, 1897.

C. & A. Potts & Co.,

Gentlemen:--You may enter our order for one of your all iron horizontal stock brick machines; one No. 2 "A" disintegrator; one mold sander and one belt elevator. The outfit herewith ordered is to be used at the plant we are now constructing at Martinsville, thirty miles southwest of Indianapolis on the I & V branch of the Pennsylvania Railroad, the same to be furnished at your earliest convenience. While engaged in the manufacture of brick at Sheridan, Ind., we used two of your horizontal soft mud machines for several years, which gave us very satisfactory results, in the facility and ease with which we operated them, as well as the character of the product they turned out. Therefore, in awarding your firm this contract, we feel justified in expecting a first-class equipment, which will make a brick from our clay and shale equal in every respect to any produced in the country. As you well know, we have had the erection of this plant in contemplation for several months, and for the purpose of securing the best, most substantial and most easily operated soft mud machines, we have visited many of the largest and best equipped yards of the central West, and after a thorough examination of the several horizontal machines which we saw in operation, I can say without prejudice that we are confirmed in the belief that your all iron brick machines is the BEST in WORKMANSHIP, SIMPLICITY and WEIGHT of those which I saw.

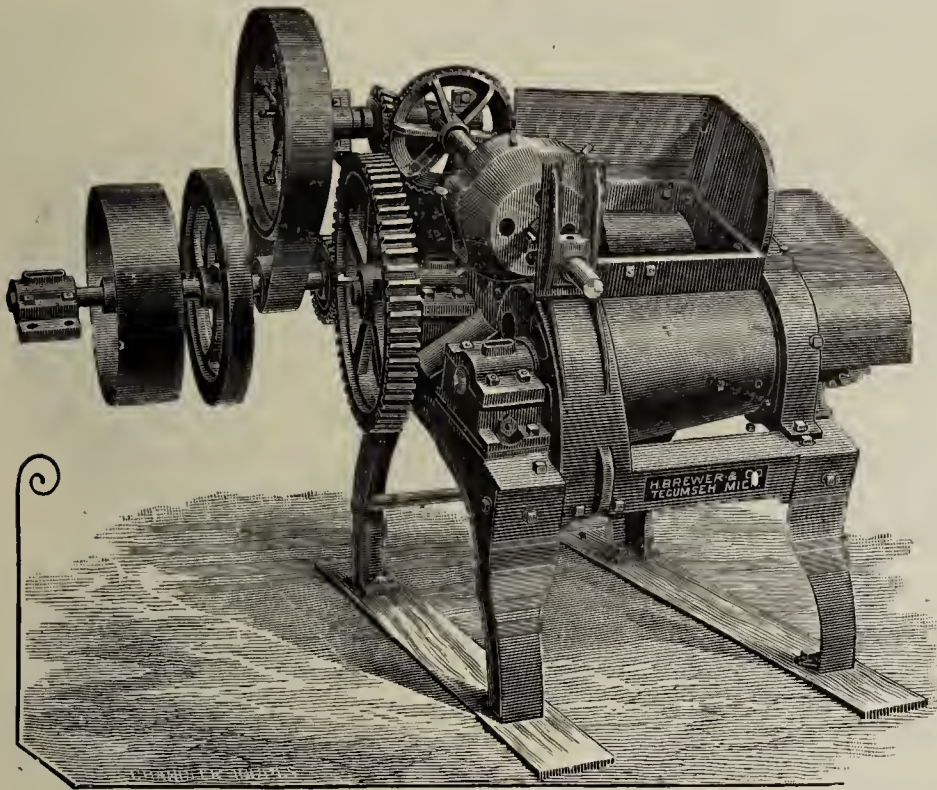
Very truly yours,

ADAMS BRICK CO.

J. C. Adams, President.

You will make no mistake when purchasing a brick machine, if you place your order with C. & A. Potts & Co. Their machinery has stood the test and is now in use on the largest and best equipped plants in the United States. Write for prices and terms.

C. & A. POTTS & CO.,
816-828 West Washington St., INDIANAPOLIS, IND.

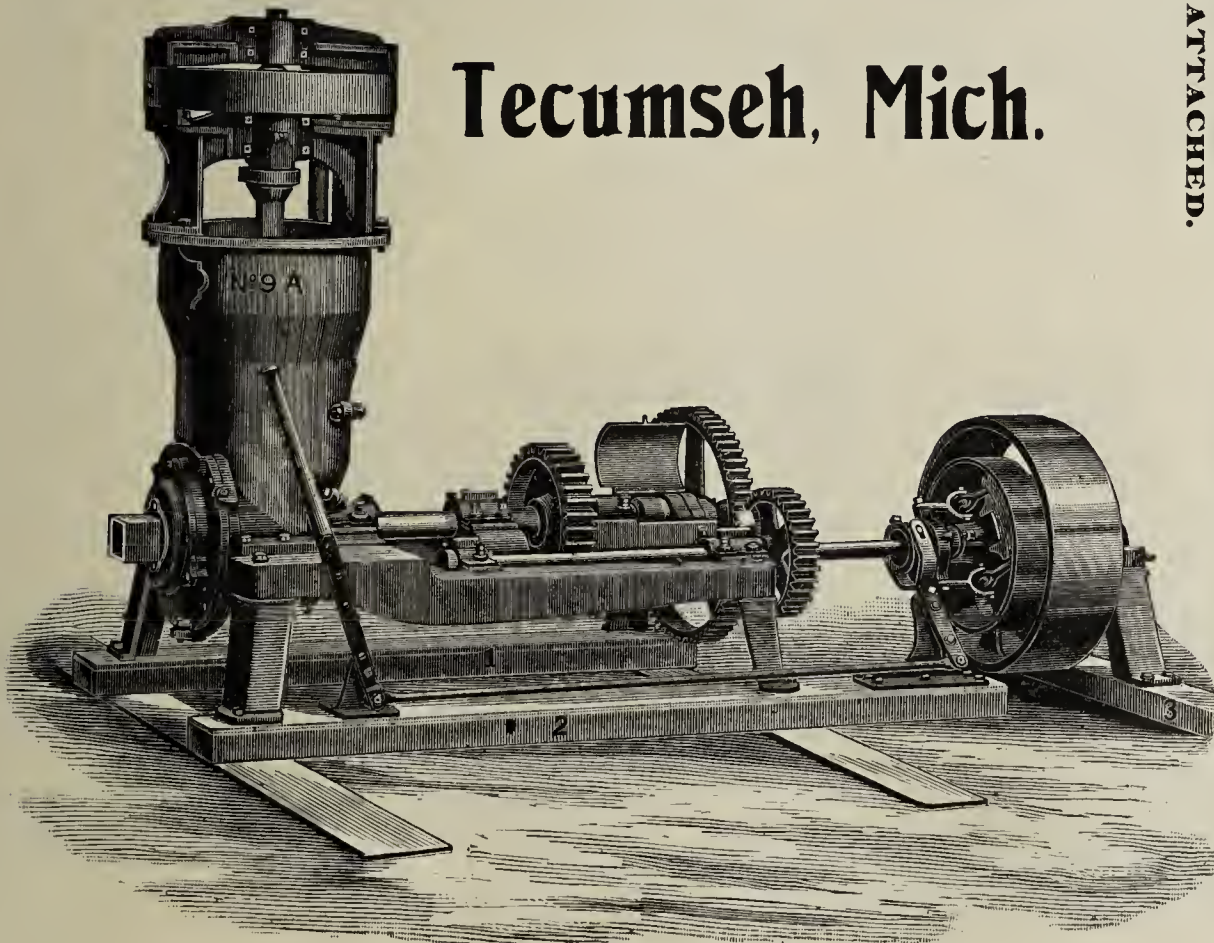


STONE EXTRACTING CLAY CRUSHER.

Manufactured by

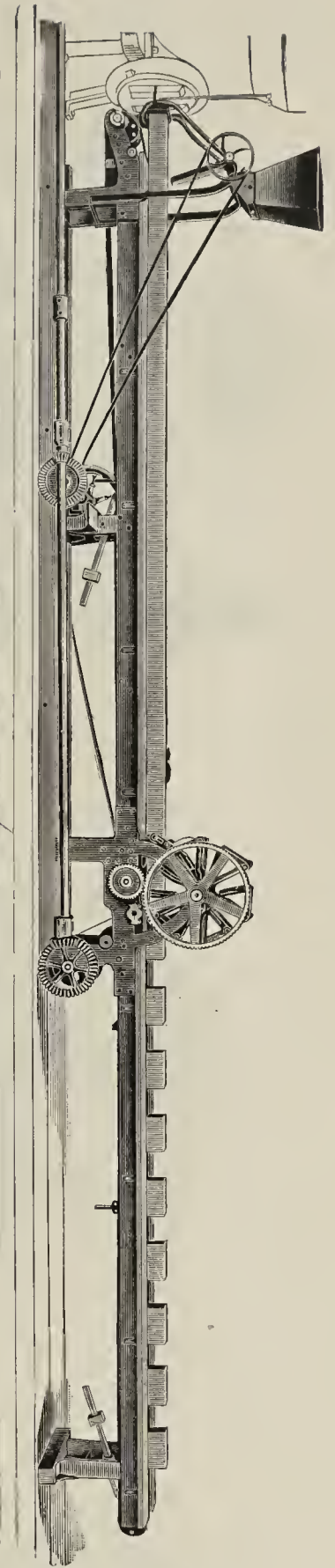
H. Brewer & Co.,

Tecumseh, Mich.

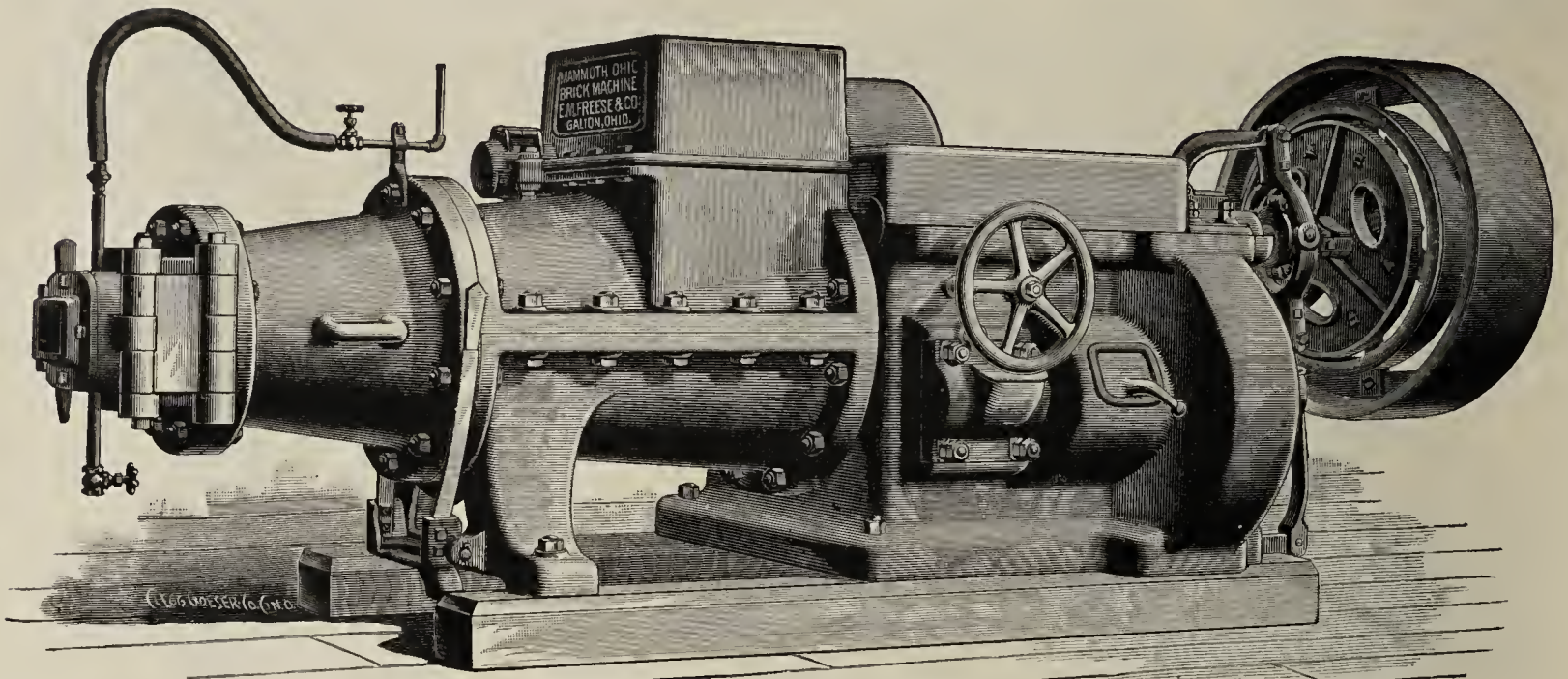


NO. 9 "A" BRICK MACHINE.

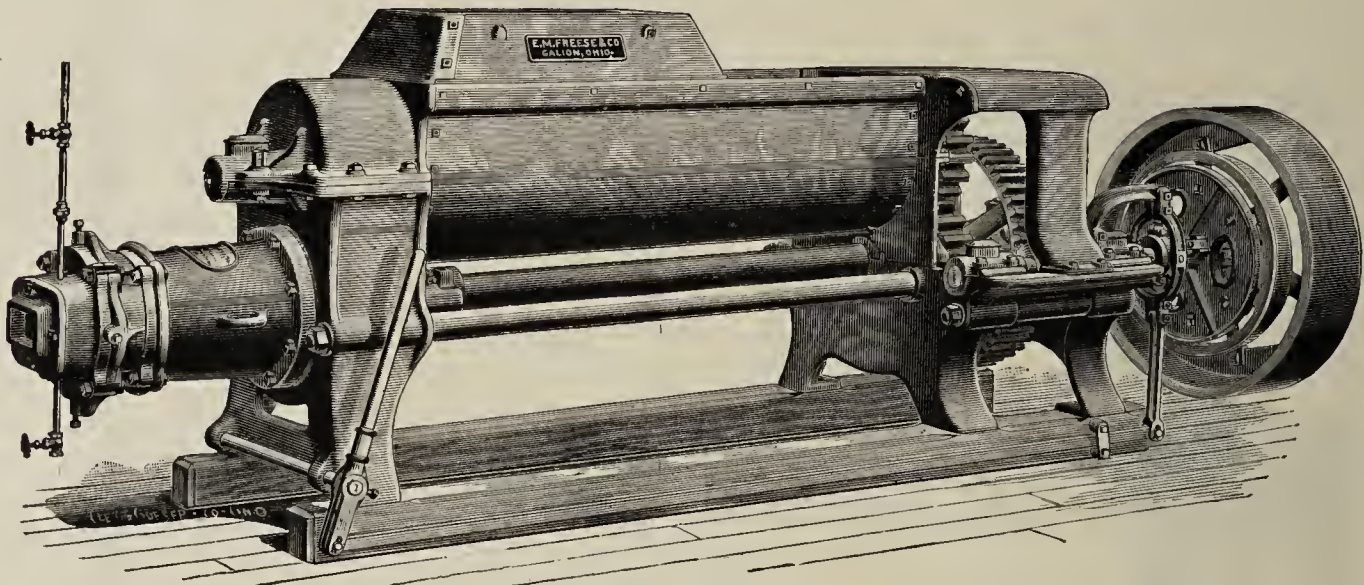
AUTOMATIC END CUT BRICK CUTTER WITH SANDER ATTACHED.



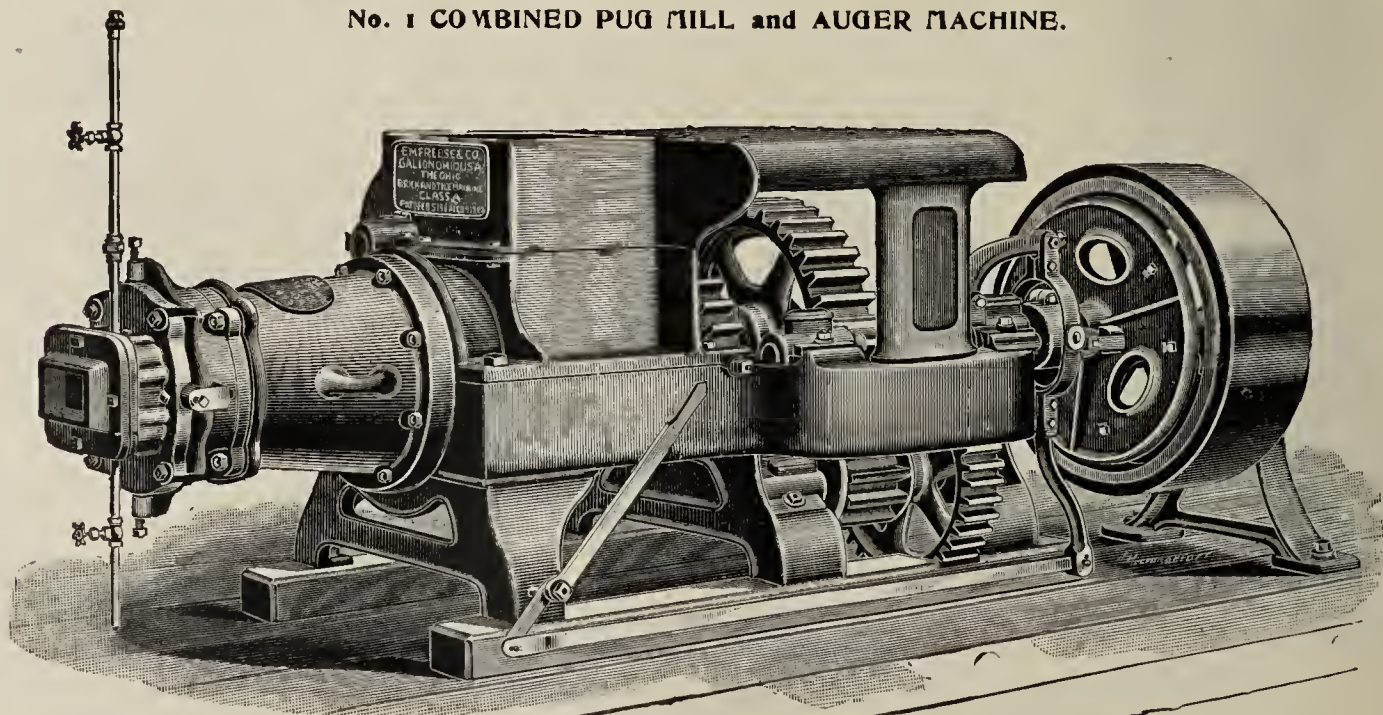
E. M. FREESE & CO., GALION, OHIO.



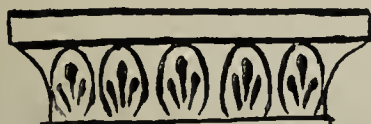
MAMMOTH BRICK MACHINE.



No. 1 COMBINED PUG MILL and AUGER MACHINE.



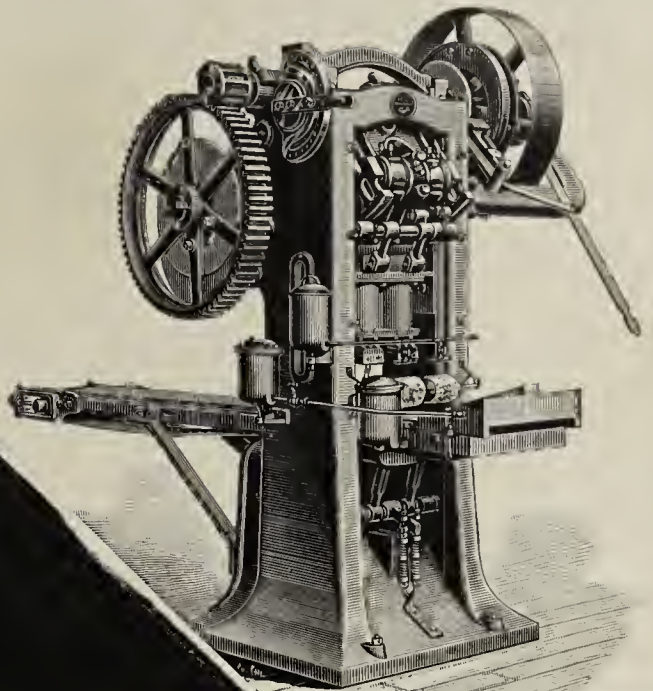
IMPROVED "A" SPECIAL OHIO BRICK MACHINE.



HERE
ARE A FEW OF THE
UP-TO-DATE
MACHINES
WE MANUFACTURE.

Brick Presses.
Disintegrators
Press Brick Machines
Auger Brick Machines
Auger Tile Machines
Sewer Pipe Presses
Dry Pans
Wet Pans
Ornamental Block Machines
Automatic Cutting Tables
Sand Mould Brick Machines
Smooth Roll Crushers
Compound Crushers
Clay Granulators
Pug Mills

And Every Machine
And Appliance
Known to the
Clay
Trade.



Evolution in Brick Making.

Are you manufacturing brick with inferior machinery, expecting them to compete with bricks made on our up-to-date line? If so you are repeating history and are as much to be pitied as were the Hebrew children centuries ago, who, in the crude way here depicted, considered themselves experts at brick making. Use our machinery and you will not have to suffer under bondage—the bondage of your own mistakes in buying and a false notion of economy.



Our complete catalogue for the asking. We manufacture everything used in the manufacture of clay products.

The AMERICAN
CLAY-WORKING MACHINERY CO.,
Bucyrus, Ohio.

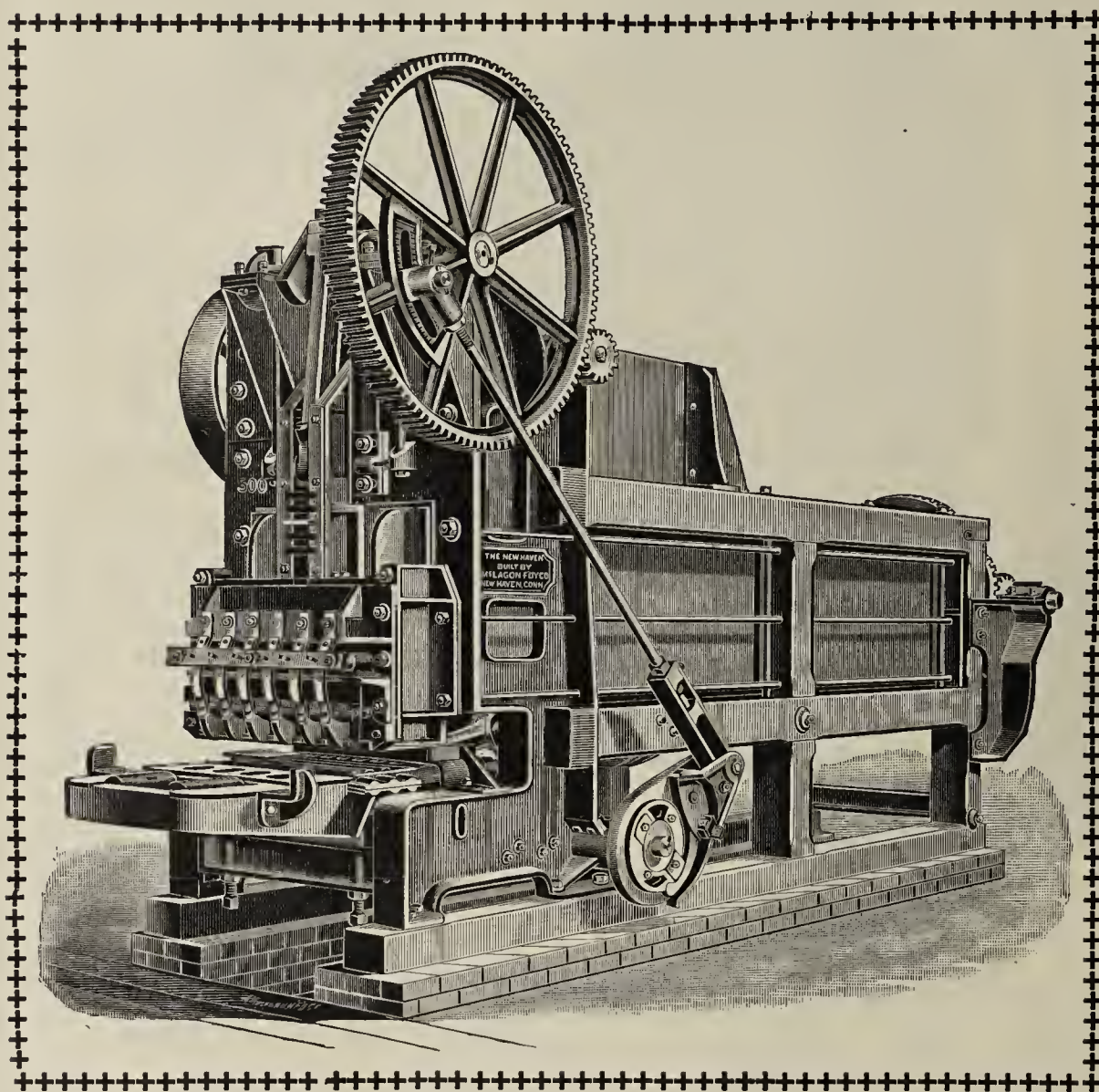


The First Brick Makers.

They Really Needed Our
Improved Brick-Making Machinery.

“New Haven” Brick Machinery,

Solid, Strong, Substantial Structures.



Soft Clay Ma-
chinery is Our
Specialty.

• •

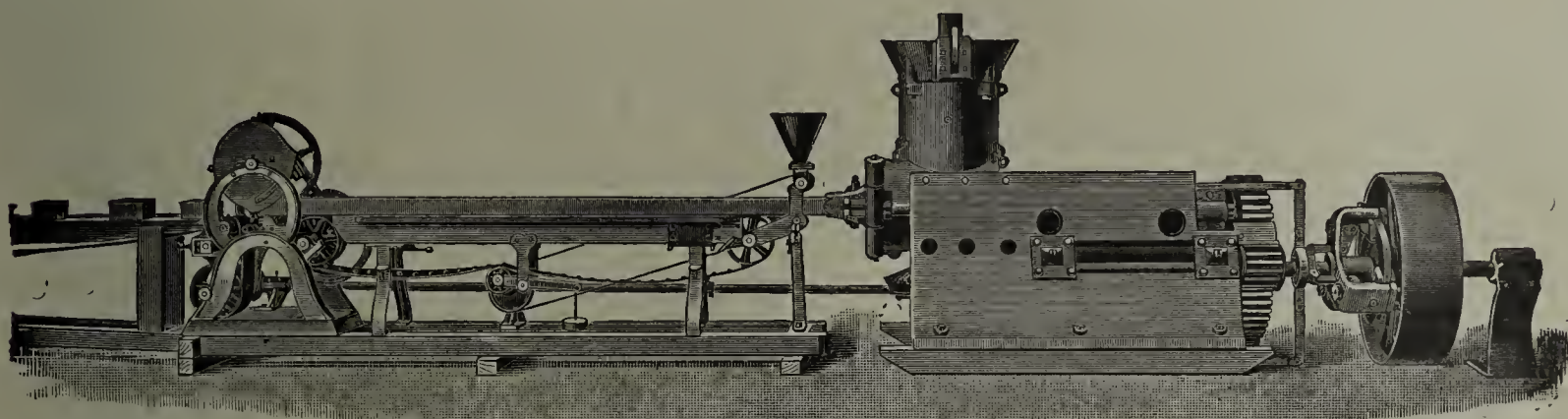
We propose to
Please each Pa-
tron.



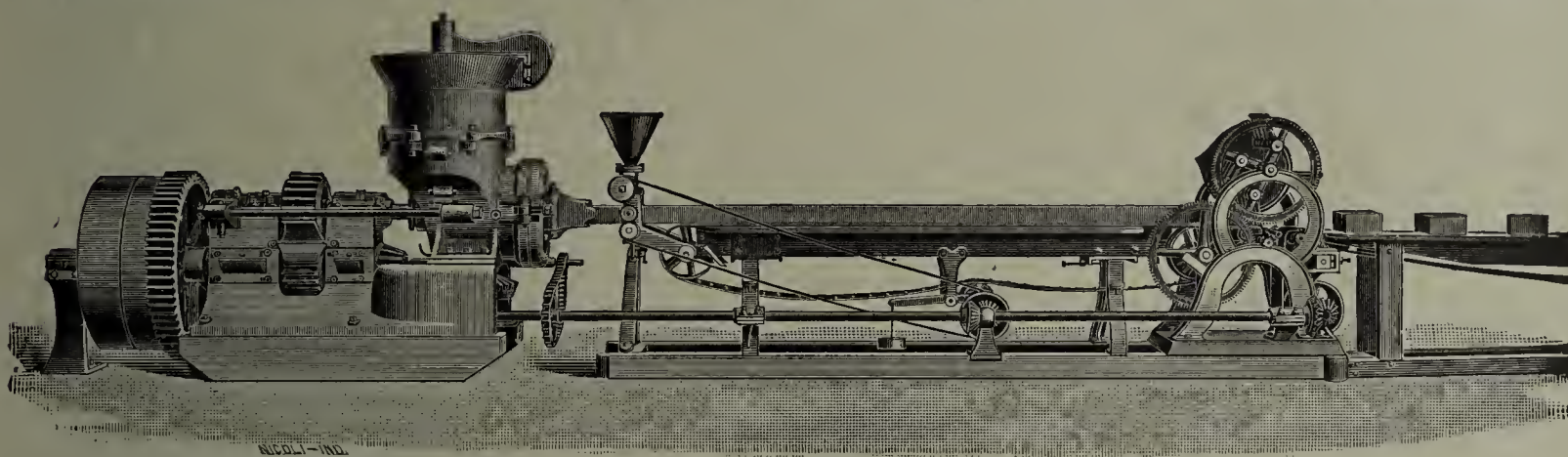
SEARCHING INQUIRY SOLICITED.

The Eastern Machinery Co.,
NEW HAVEN, CONN.

WONDER MACHINERY.

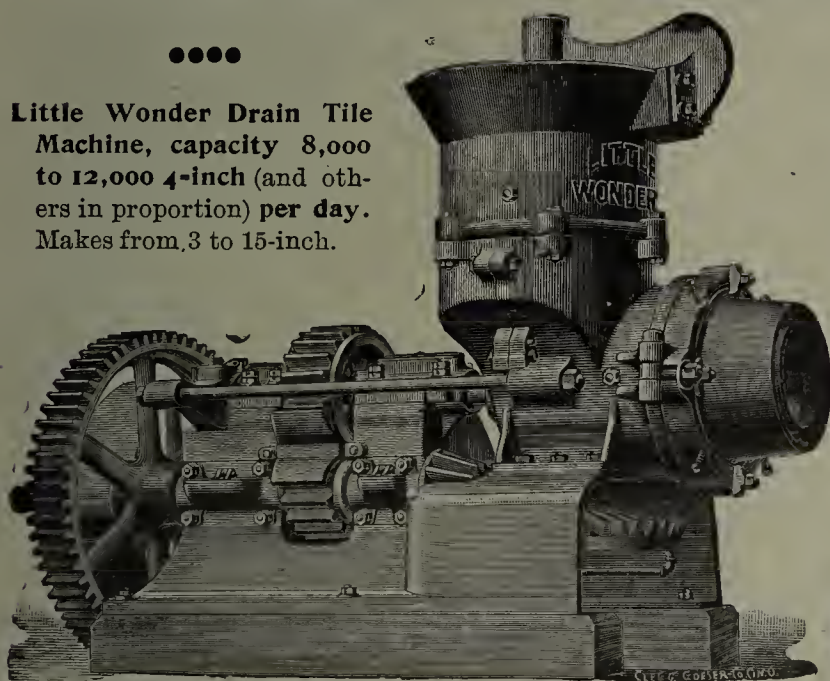


Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.



Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

●●●●
 Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



THE WONDER BRICK MACHINES have a Great Puging Capacity, therefore, less lamination in the brick. Guaranteed to run with less power and require less repairs, hence, they are "MONEY SAVERS" and MONEY MAKERS."

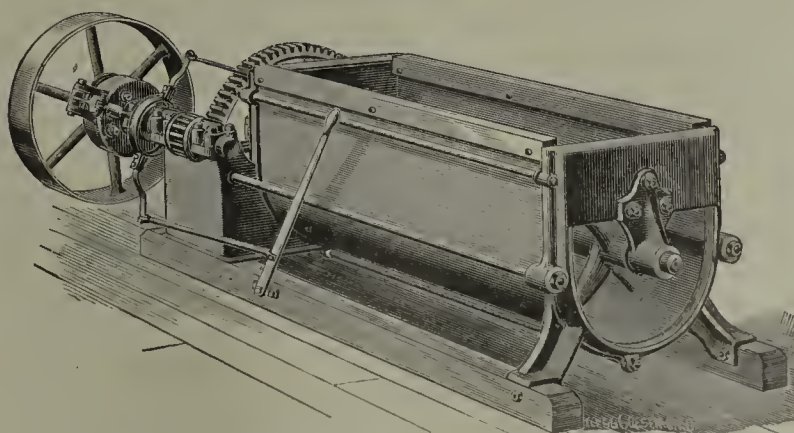
MANUFACTURED BY

The Wallace Mfg. Co.,
 Frankfort, Ind.

CHICAGO AGENT:

Chicago Brick Machinery Co., Chicago, Ill.

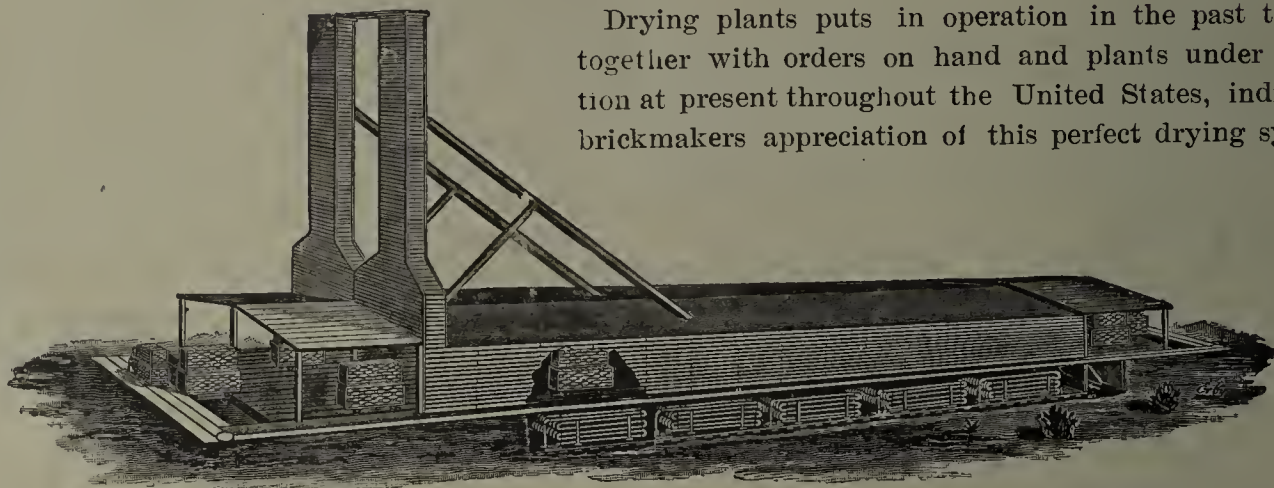
Catalogue Free.



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity.

Iron Clad Dryer.....IN THE LEAD

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

•SEE WHAT THEY SAY:•

WM. SANKEY, THOS. SANKEY,
WM. E. SANKEY, F. M. SANKEY,
T. H. SANKEY, J. F. SANKEY.

CAPACITY: 40,000 BRICK PER DAY.

TELEPHONES: { OFFICE, S. S. 11-3.
WORKS, S. S. 11-2.
WORKS, E. E. 589

SANKEY BROS., BRICK.

ORNAMENTAL PRESSED, SELECT STOCK, BUILDING, PAVING AND GUTTER BRICK.

SPECIAL AGENTS FOR MARTIN'S IMPROVED BRICK MACHINE.
RAILROAD SHIPPING A SPECIALTY.

OFFICE: 2101 Carson Street.

WORKS: Head of 18th Street, S. S.
Penn and Atlantic Aves., E. E.

PITTSBURGH, PA., May 3, 1897.

WOLFF DRYER CO., Chicago, Ill.

Gentlemen:—Replying to your inquiry regarding dry house at our east end plant, will say, that it is two years since we equipped that yard. We found the earthy deposit there would make the best quality of stock brick; soft mud process, but would not stand direct heat drying; such as we were accustomed to use, therefore concluded to test this brick in your dryer, resulting in our installing your system, producing results of a most satisfactory nature, proving the excellence and correctness of your system of absorbing moisture from centre to surface by drawing a volume of warm air through the brick, carrying off the moisture and leaving our brick perfect and bone dry, saving us money in burning and producing beautiful color.

Six months experience proved to us that it would pay to install your system at our South side works, which we did one year ago, with equal satisfaction. At this yard, we have shale clay manufacturing soft mud and dry-press brick and was equipped with the best kind of dry floor, heat supplied from natural gas; we sacrificed this and built an Iron-Clad under the same roof. This loss has been our gain; the quality of brick and saving in cost of drying enables us to show a fair profit, which is very pleasing, considering prevailing low prices for brick. We dry all our dry-press brick before setting in the kiln.

Respectfully yours,

SANKEY BROTHERS.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVIII, No. 6.

INDIANAPOLIS, IND., DECEMBER, 1897.

\$2.00 a Year in Advance.

We Aim to Build Only the Best in its Class.

It has Paid our Customers to Buy and Use our Machines,
We Believe it Would Pay You.

THE PALMER BRICK CO.

ATLANTA, GA., NOV. 13, 1897.
CHAMBERS BROS. CO., Philadelphia, Pa.

Gentlemen:—Replying to your valued favor of the 2nd inst we are pleased to say we have had your machinery in constant use about six years and would not be without it for double the amount of its cost.

We used other machinery for three or four years before purchasing yours and would not have it again if offered as a present.

Every piece of Machinery we have bought from you has been first-class in every respect.

Yours very truly,
PALMER BRICK CO.
W. D. Palmer, Pres.

THE MILL HALL BRICK WORKS.

LOCK HAVEN, PA., NOV., 5, 1897.
MESSRS. CHAMBERS BROS. CO.,
Philadelphia, Pa.

Gentlemen:—The Side Cut Brick Machine that you sold us last Spring is giving entire satisfaction, both as to quality and quantity of brick we are making on it.

We are now making first-class brick out of clay that the machine yours replaced would not work.

Wishing you success, we are,
Very truly yours,
THE MILL HALL BRICK WORKS,
Geo. O. Salmon, Supt.

THE JACKSONVILLE BRICK CO.

JACKSONVILLE, FLA., NOV. 5, 1897.
CHAMBERS BROS. CO., Philadelphia, Pa.

Gentlemen:—We are pleased to state that we are using your No. C-CD machine in our plant, and it is giving us perfect satisfaction; we make 40,000 brick per day with ease. The repairs during the three years have been very small in comparison with those required by other machines with which we have had experience.

Taking everything into consideration, we think the "Chambers" a success.

Very truly yours,
THE JACKSONVILLE BRICK CO.,
By W. Moore Angus.

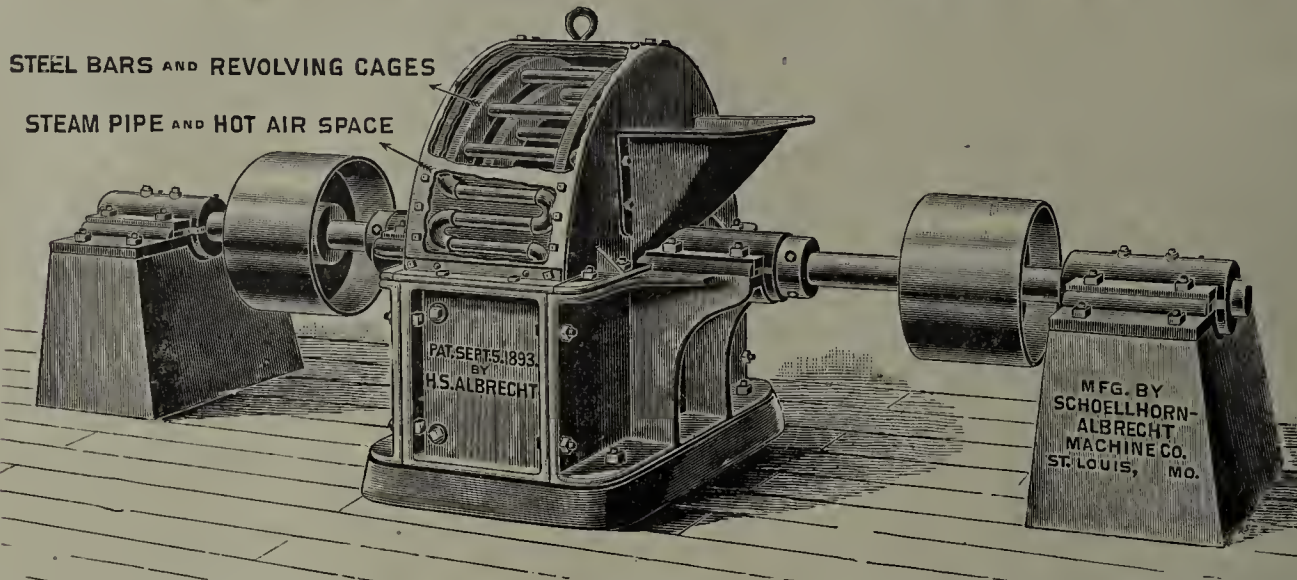
Chambers Brothers Company,

FIFTY-SECOND STREET, BELOW LANCASTER AVE.,

J. E. EASTES, Chicago Agent,
171 South Canal Street.

PHILADELPHIA, PA.

Patent Disintegrator.....



FOR PUL-
VERIZING
COMMON
CLAY,
FIRE CLAY,
SLATE,
PAINT,
BONES,
FLINT AND
ORE OF
EVERY DE-
SCRIPTION.

THE SIZES AND PRICES OF DISINTEGRATORS ARE AS FOLLOWS:

12-inch diameter,	-	-	each	\$200
13 "	"	"	"	300
24 "	"	"	"	400
30 "	"	"	"	500
36 "	"	"	"	650
40 "	"	"	"	800
48 "	"	"	"	1,000
60 "	"	"	"	1,600

● ——— WRITE FOR DISCOUNTS.

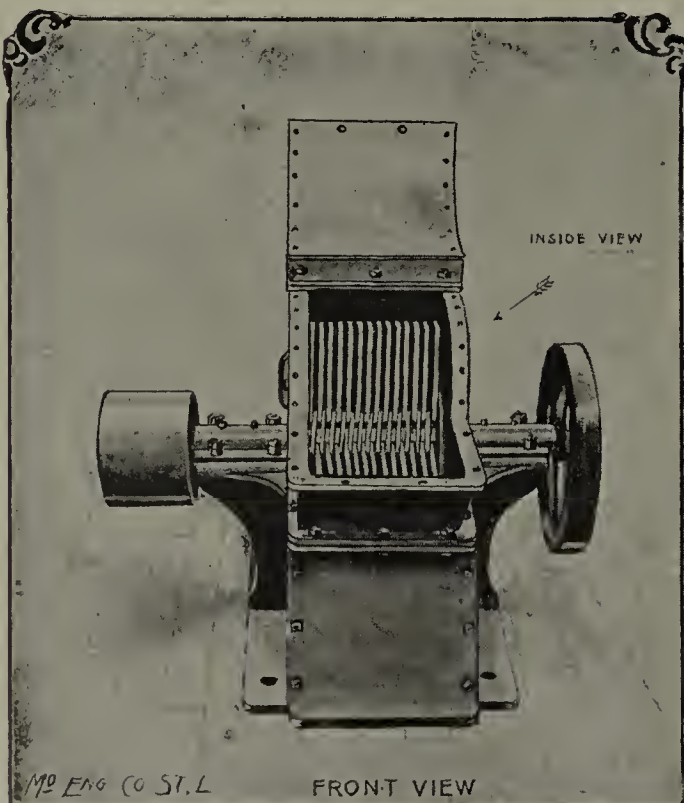
PARTIES DESIRING TO PURCHASE THESE MACHINES will please state for what purpose mill is desired, and same will be built according to the work required of it, as different materials require different construction of the steel bars on the inside.

We have a number of these Disintegrators in use on different materials, and all are giving entire satisfaction.

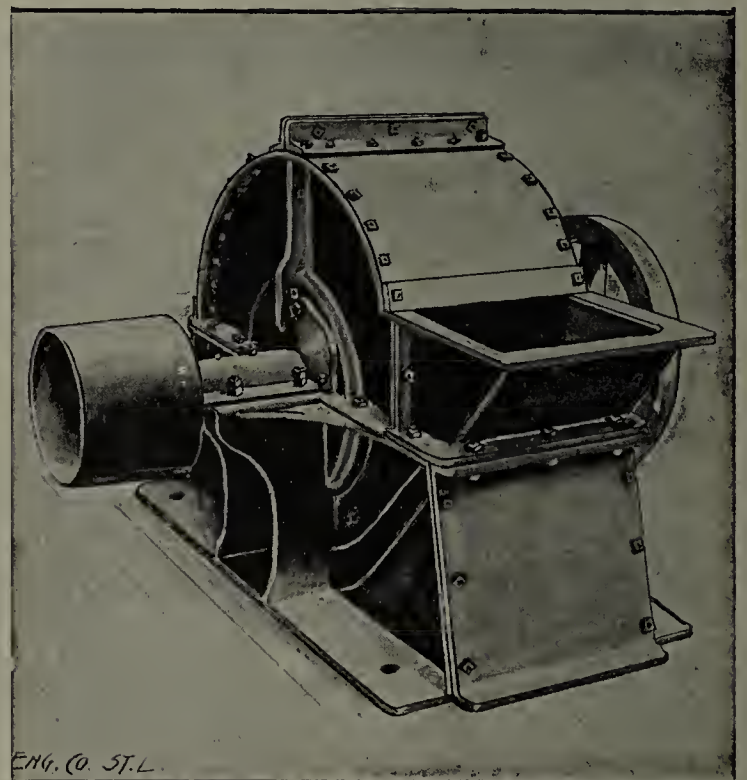
Schoellhorn-Albrecht Machine Co.,

609 and 610 North Levee and
616 and 618 North Commercial St., ST. LOUIS, MO.

NEW IMPROVEDPATENT BREAKER AND PULVERIZER.



EXCEL IN CAPACITY AND DURABILITY.



THE SIZES AND PRICES OF DISINTEGRATORS ARE AS FOLLOWS:

24-inch diameter,	each	-	-	\$ 500
30 "	"	"	-	650
36 "	"	"	-	850
40 "	"	"	-	1,000

Write for Discounts.

THESE MACHINES break and pulverize clays and materials of all kinds to an absolutely fine powder. They are far superior to anything of the kind in the market, being provided with our patent self-oiling dust-proof boxes, they can be run at a much higher speed than any others. For full particulars, testimonials, etc., write the

ST. LOUIS PULVERIZER CO., Patentees and
Manufacturers

616 N. Commercial St., ST. LOUIS, MO.



Eastern Office: No. 284 Pearl Street,
NEW YORK.

General Office and Works: No. 231 North Union St.
CHICAGO, ILL., U. S. A.

IF YOU NEED..

Wooden Pallets,

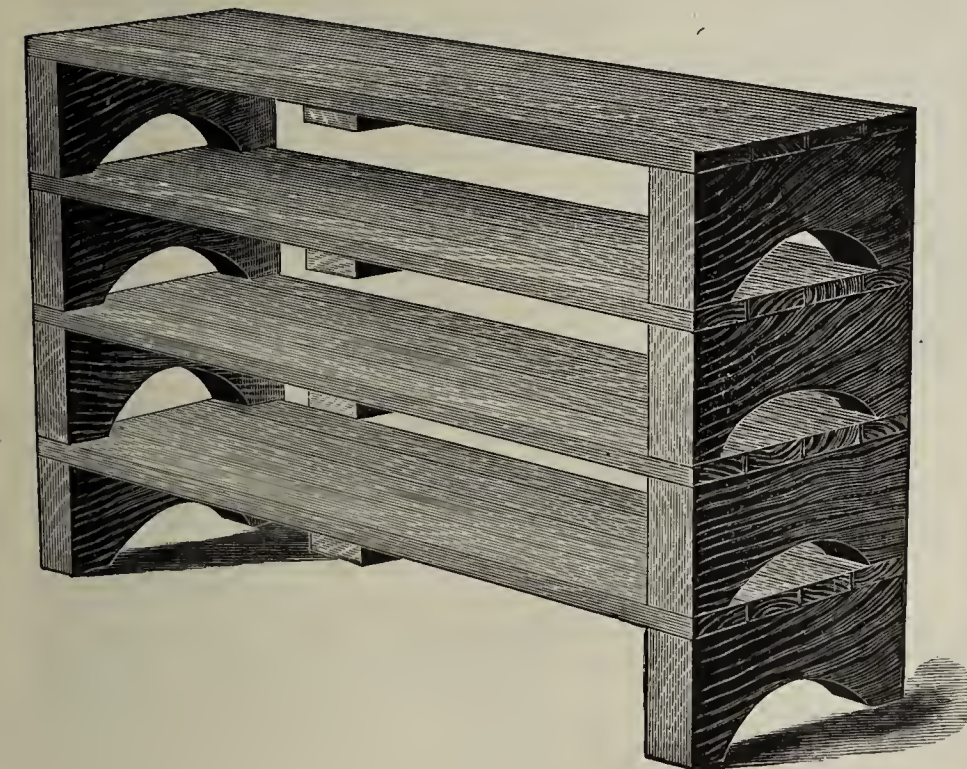
WE CAN FURNISH YOU THE BEST.

We make all Styles of

Rack Pallets,
Hacking Pallets,
Pallets for Dryers,

Also *Decks for Dry Cars.*

We can ship them anywhere.



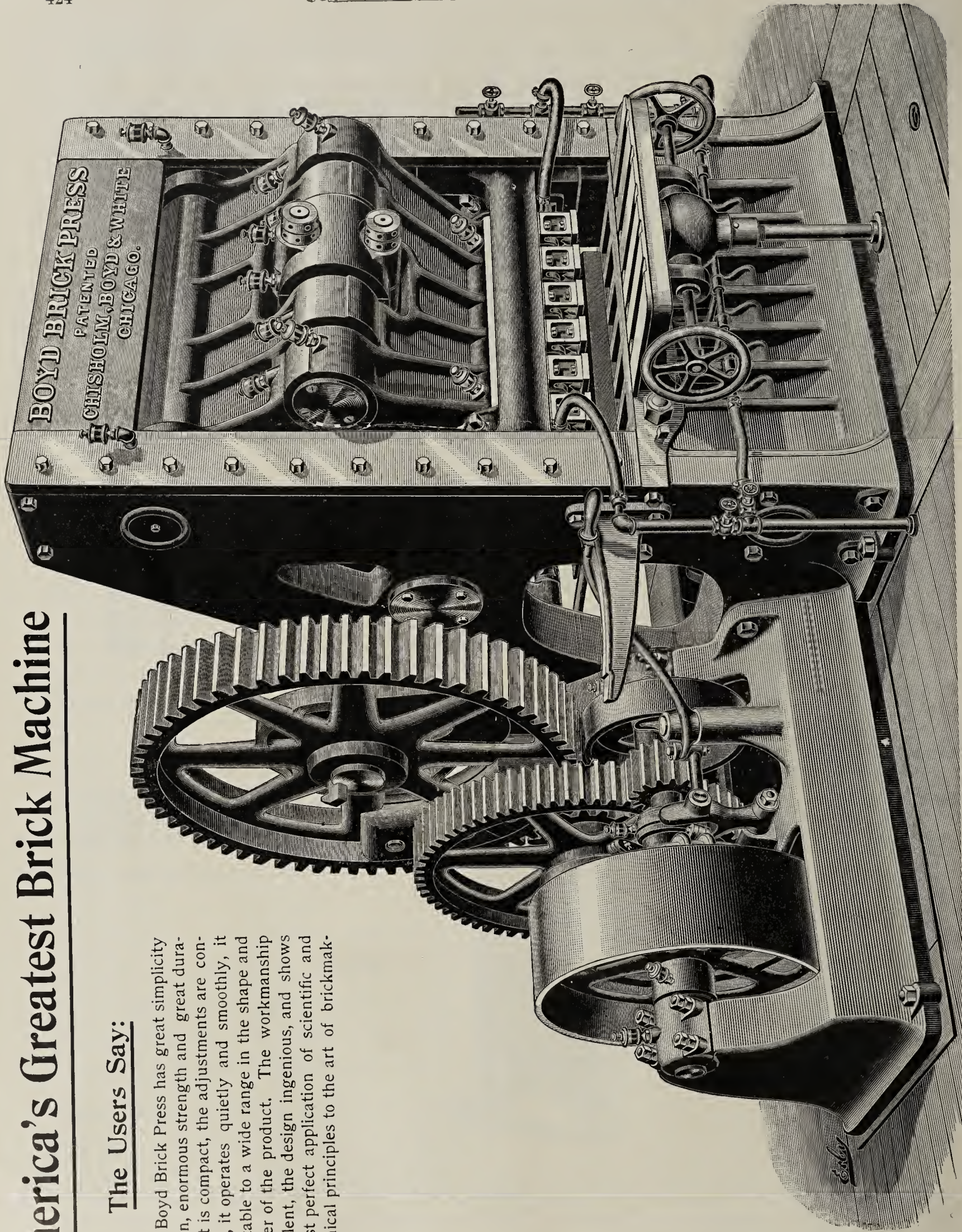
Get good pallets from those who know how to make them. It will pay you in the long run. Send for circulars and prices. Address

W. B. MERSHON & CO., - Saginaw, East Side, Mich.

America's Greatest Brick Machine

The Users Say:

"The Boyd Brick Press has great simplicity of design, enormous strength and great durability; it is compact, the adjustments are convenient, it operates quietly and smoothly, it is adaptable to a wide range in the shape and character of the product. The workmanship is excellent, the design ingenious, and shows the most perfect application of scientific and mechanical principles to the art of brickmaking."



OFFICE AND WORKS,
57th and Wallace Streets,

CABLE ADDRESS:
"CHISHOLM, CHICAGO"
A. B. C. CODE USED.

CHISHOLM, BOYD & WHITE CO., CHICAGO, U. S. A.

CLAY WORKING MACHINERY

The Simpson Brick Press,

The World's Standard.

Used by the most successful brickyards throughout the United States and Canada.

We manufacture a complete line of Clay-working machinery.

Do not experiment. Invest your money in a **SURE THING.**

Complete plants constructed and guaranteed. Write for catalogue.

The Simpson Brick Press Co.,

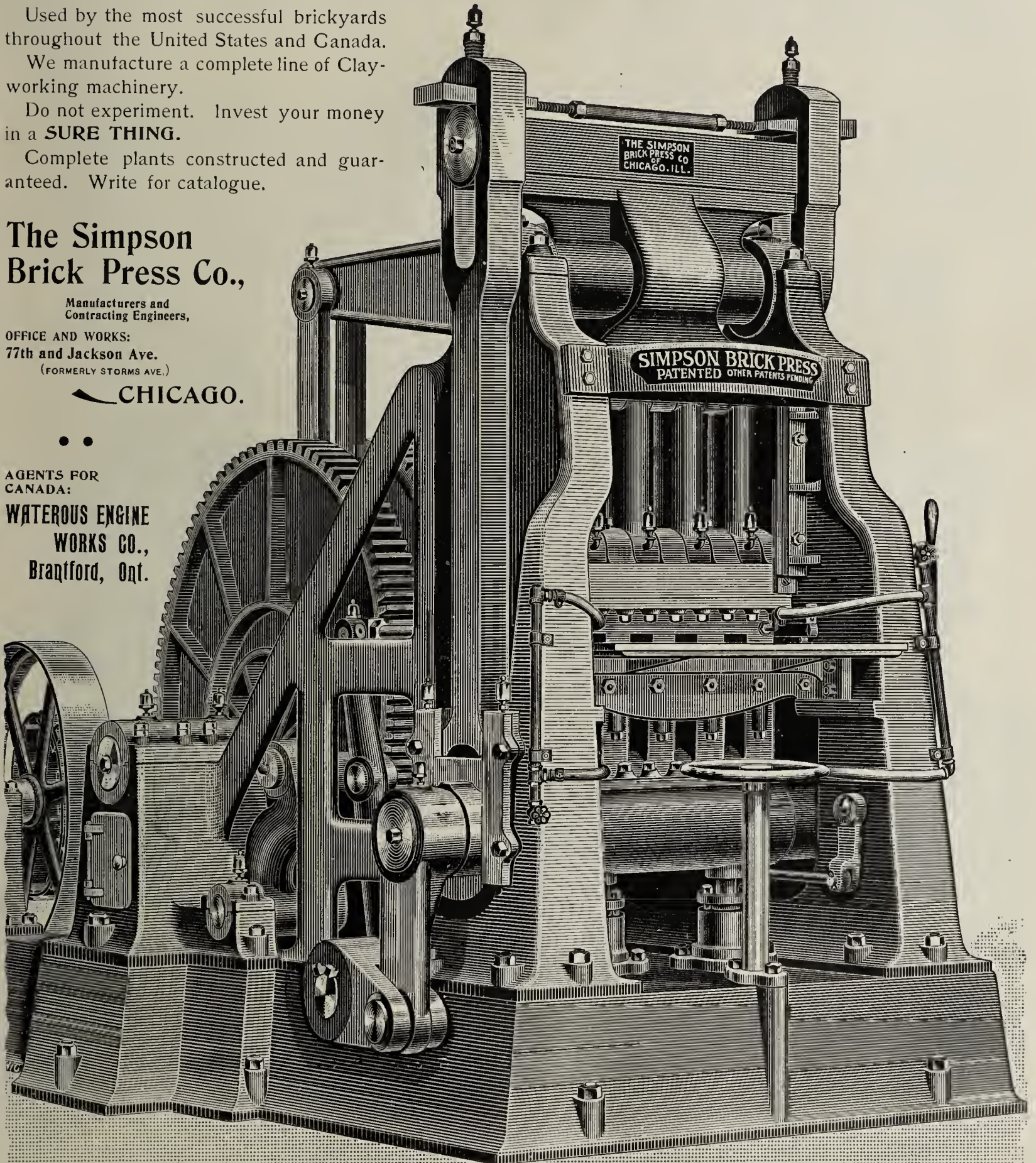
Manufacturers and
Contracting Engineers,

OFFICE AND WORKS:
77th and Jackson Ave.
(FORMERLY STORMS AVE.)

CHICAGO.

AGENTS FOR
CANADA:

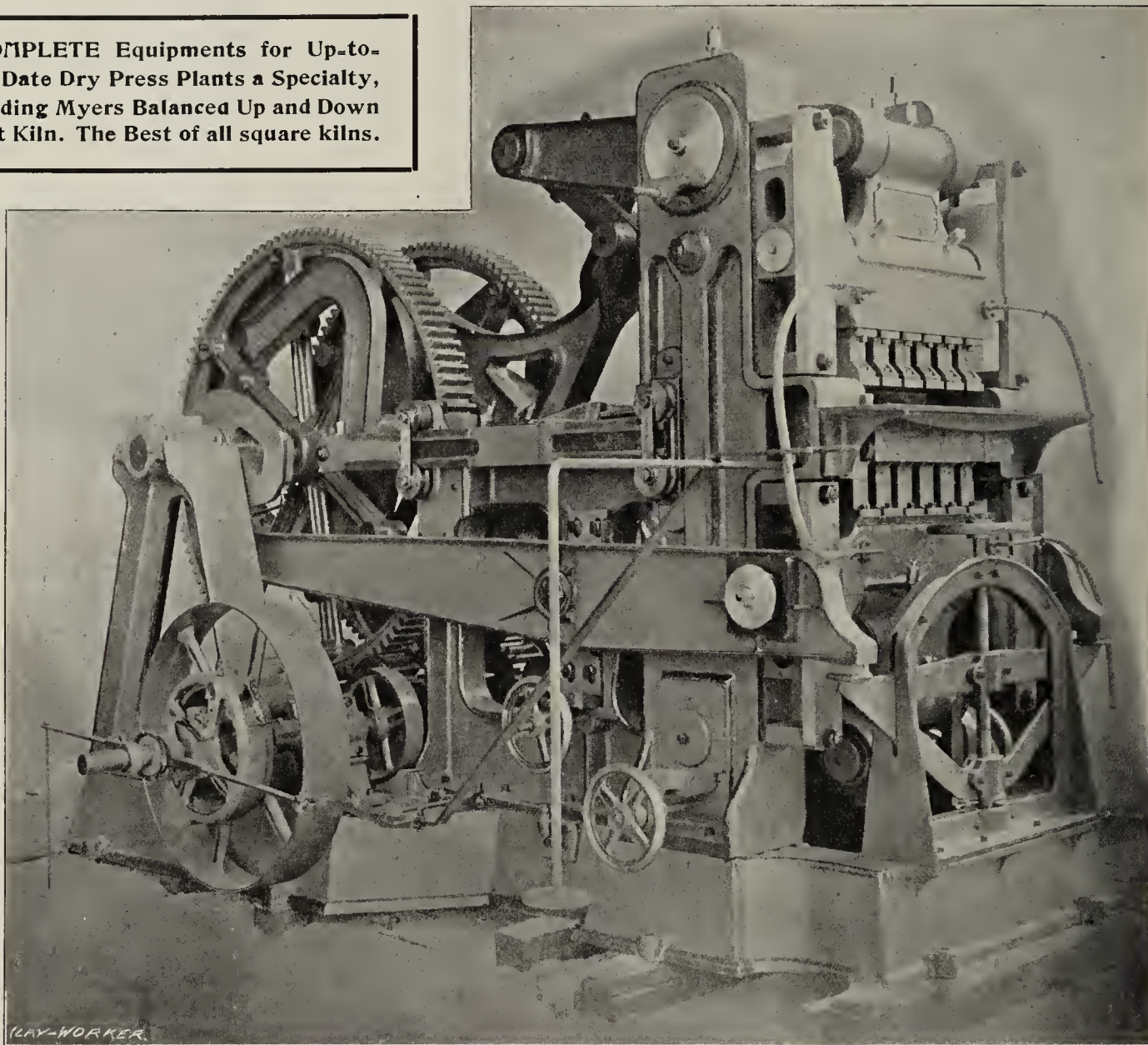
WATEROUS ENGINE
WORKS CO.,
Brantford, Ont.



The Fernholtz Improved Brick Press.

THIS press is the result of fifteen years of practical experience as a successful press brick and press brick machine maker, backed by inventive and mechanical talents of a high order. It is unequalled for strength and easy running, requiring only 6 to 7 horse power to operate the largest 6 mold press. All the parts subject to strain are made of the best bessemer steel and every part can be seen and got at easily. The thickness of the brick can be changed or regulated without stopping the press, and every press is fitted with the Fernholtz mould which is gener-

COMplete Equipments for Up-to-
Date Dry Press Plants a Specialty,
including Myers Balanced Up and Down
Draft Kiln. The Best of all square kilns.



The Fernholtz Six-Mold Brick Press.

ally admitted to be the best mold in use. For fine pressed and ornamental brick this machine is unequalled, the pressure on and movement of the clay in the mold being such as to prevent granulation and insures the most perfect product possible.

We manufacture this press and other machinery in our own shops and guarantee it fully. Our two-mold press is especially designed for ornamental brick of all kinds. **Prices and terms reasonable.**

The opinion of those using our press and full information on application.

The Fernholtz Brick Press Co.,

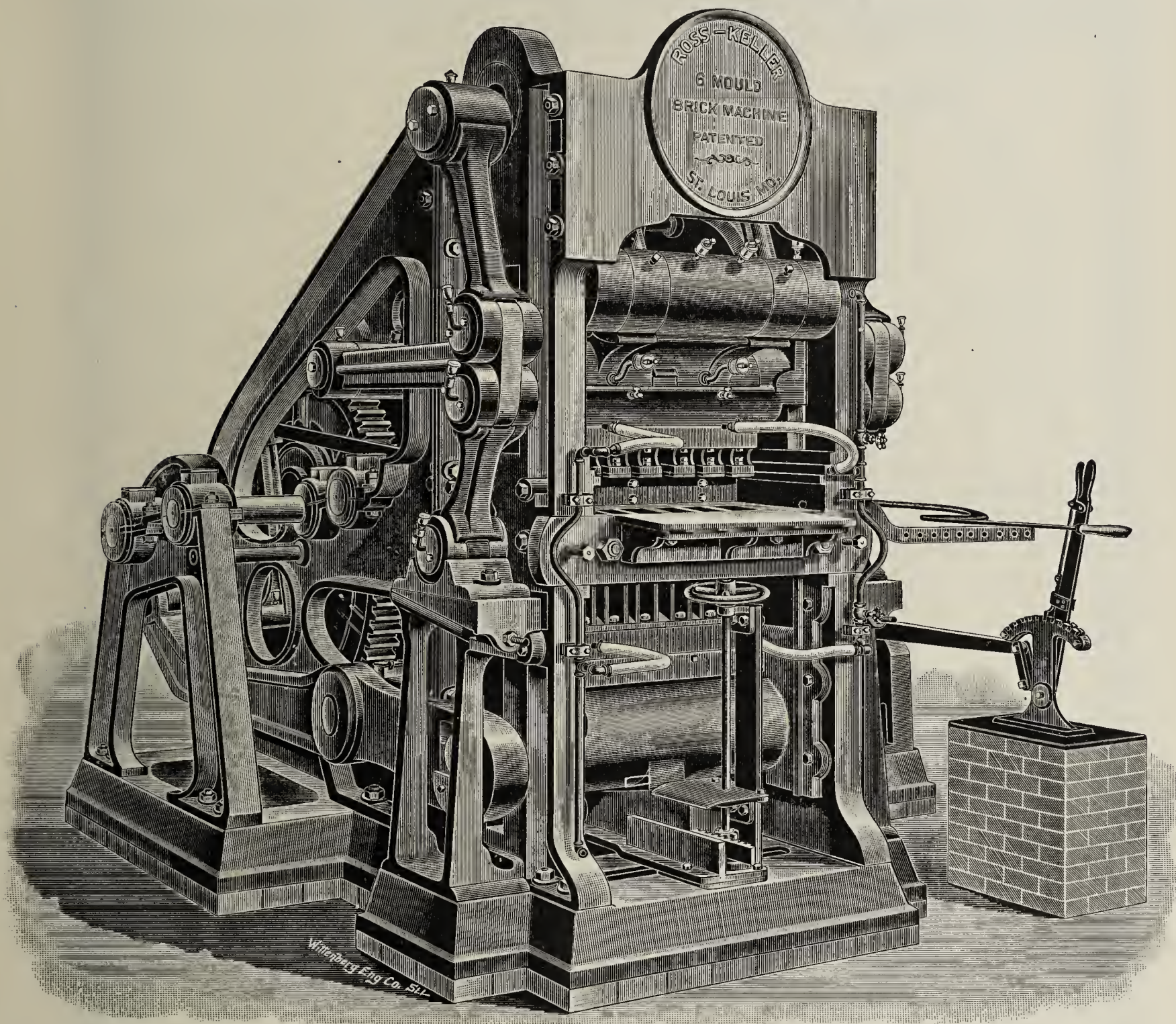
1214 and 1216 Poplar Street,

ST. LOUIS, MO.

The Latest Improved Ross-Keller TRIPLE . . PRESSURE Brick Machine.

Manufactured in four and six-mould sizes. Weight of four-mould machine 58,000 pounds; capacity 24,000 brick per day. Weight of six-mould machine 75,000 pounds, capacity 36,000 brick per day.

—BRICK SET IN KILN DIRECT FROM MACHINE.—



The triple pressure movement of this press, is the best ever embodied in a machine for making pressed brick. Our mould box is 9 inches deep, thus enabling us to make all kinds of ornamental and shape brick, also Roman and edge brick. Requires but one minute to change the brick from one thickness to another. Has twice the pressing power of any other machine, and sufficient strength to stand up under this great strain. Especially adapted for working shale and other similar materials. Presses the brick equally on both sides, and removes every semblance of granulation from face of same. No other machine does this. We guarantee this press and its product superior to any other made.

If you want the best come and see us, or write for price and full particulars, address

Ross-Keller Brick Machine Company,
820 Commercial Building, ST. LOUIS, MO., U. S. A.



FAME

WHEN A MAN or a product rises to fame, it is because of great intelligence, or pronounced superiority. An innate knowledge of human nature and a wonderful mastery of the English language are the foundation stones of the fame of Shakespeare. Ingersoll is famous, not so much because of his agnosticism, but mainly because of his ability to pour forth a flood of eloquence that moves audiences from peals of laughter to sobs and tears.

Fame comes to the field of manufacture just as it comes to men—because of decided excellence. This is true in a marked degree of

The Standard Brick and Tile Drier.

It is famous because of its simplicity.

It is famous because of its adaptability to clays of different natures.

It is famous because it can be so easily controlled.

It is famous because of the perfect manner in which it employs the continuous system of drying.

It is famous because of its real economic features.

It is famous because it does not disappoint—because it invariably does all and a little more than is claimed for it.

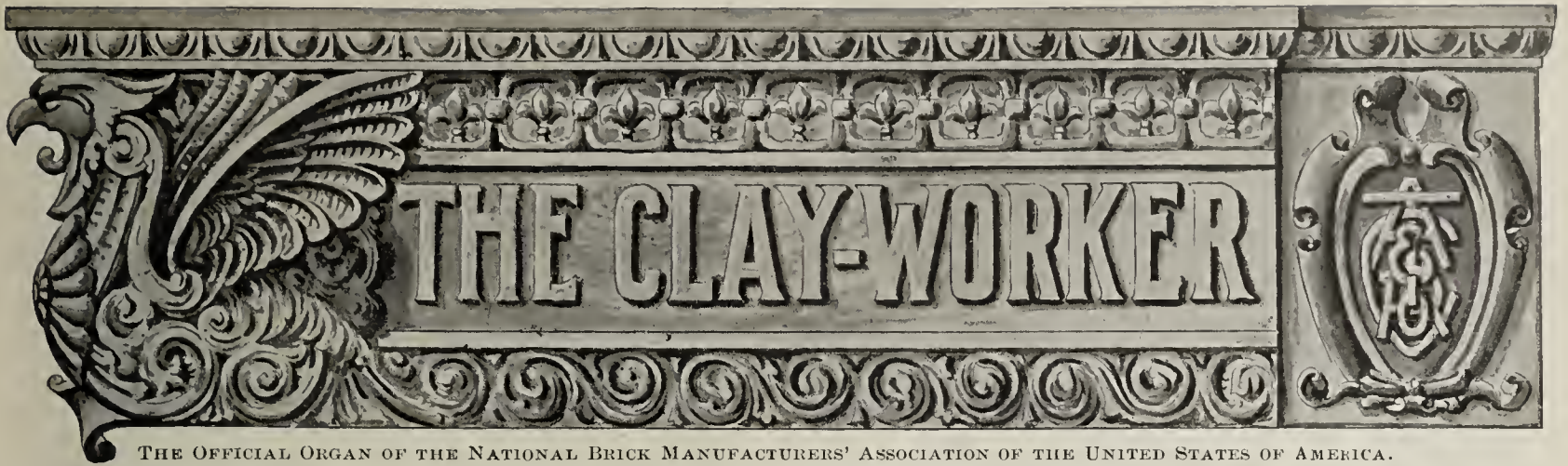
If you want to know all about **The Standard Drier**, our illustrated Catalogue will supply the information. Sent free on request.

....

The Standard Dry Kiln Co.,

186 South Meridian Street,

—INDIANAPOLIS, IND.



THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

VOL. XXVIII.

INDIANAPOLIS, IND., DECEMBER, 1897.

No. 6.

Written for the CLAY-WORKER.

THE HEART OF PITTSBURG.

In and About the Convention City—A Good Place for Brickmakers.

PITTSBURG is a very old city, having been settled early in the last century. A most interesting reminder of that period is the old Block-house, which still stands down on "The Point," near where the waters of the Allegheny and Monongahela rivers mingle and flow together to the West and South as the Ohio.

As our illustration shows, it is a quaint little windowless structure, which appears to-day as it did when erected by Col. Bouquet in 1764, according to the corner-stone, on which the date is rudely carved. The only openings affording light and ventilation are the little slot-like apertures cut through the solid timbers for the evident purpose of enabling those within to draw a bead with their flintlocks on any hostile visitor.

The old block-house is particularly interesting to brick-makers, for the reason that a portion of it is built of brick said to have been imported from France.

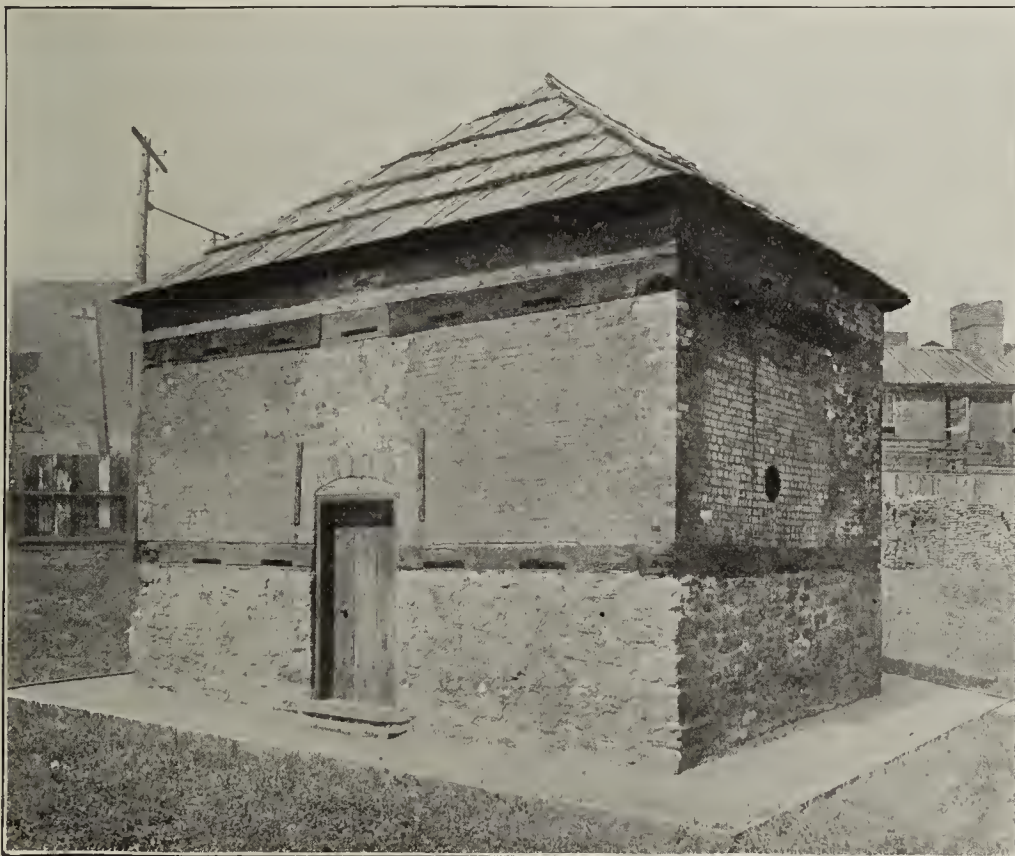
Just why the pioneers should have gone to the trouble and expense of transporting brick from the coast to the then well-nigh impenetrable mountain fastness, where beneath their feet lay vast quantities of raw material with which to make equally good or better brick right on the spot, is a conundrum we do not pretend to solve.

We have always been a little skeptical on the genuineness of imported brick, particularly so when the brick are found hundreds of miles from the coast, as in this case. Considering

the difficulties of transportation in those days, it does not seem reasonable. However, tradition says they were imported, and we must admit they look it. They are about the same size as our ordinary common brick, and, though irregular and rough in shape, are hard-burned, and to that extent, at least, speak well for the handiwork of our primitive craftsmen.

A lot of these brick taken from an adjoining building are piled near by, and we presume those of our readers who have a craving for relics will be permitted to carry one home. 'Twill not be necessary to pack it in soft material to protect the edges. So hard are they, we think a dozen of them might make a good showing in one of Prof. Orton's rattler tests.

Situated midway between our two greatest commercial centers—to be exact, 444 miles from New York and 468 from Chicago—and in the midst of one of the richest mineral districts on the continent, with a wealth of natural resources almost beyond belief, it is little wonder that Pittsburg has grown in population and wealth until she rivals in importance and volume of products the chief commercial cities of the world. It is not generally known, perhaps, but it is a fact, her statisticians claim, that more tonnage, including rail and river



THE OLD BLOCK HOUSE, PITTSBURG, ERECTED 1764.

traffic, now originates in Pittsburg than any other city in the world. Her principal products are coal and iron, which are taken from the mountains—Nature's storehouses—which tower all about her. There are many other products, though, which rival these. Her glass factories, for instance, yearly turn out ware exceeding in value the products of many gold and silver mining districts.

Not the least valuable of her great mineral resources are the deposits of clay of various kinds which crop out on every

hillside. It is peculiarly fitting that the clayworking craft should gather there at this time to consider ways and means for making the most of the era of prosperity now dawning, for it is there that the first real awakening from the torpor of depression is making itself felt. It is fitting, too, for the reason that her brickmakers have felt less keenly the hard times than those of almost any other community in the country, and therefore are better able to offer the hospitality necessary for the best success of such a gathering.

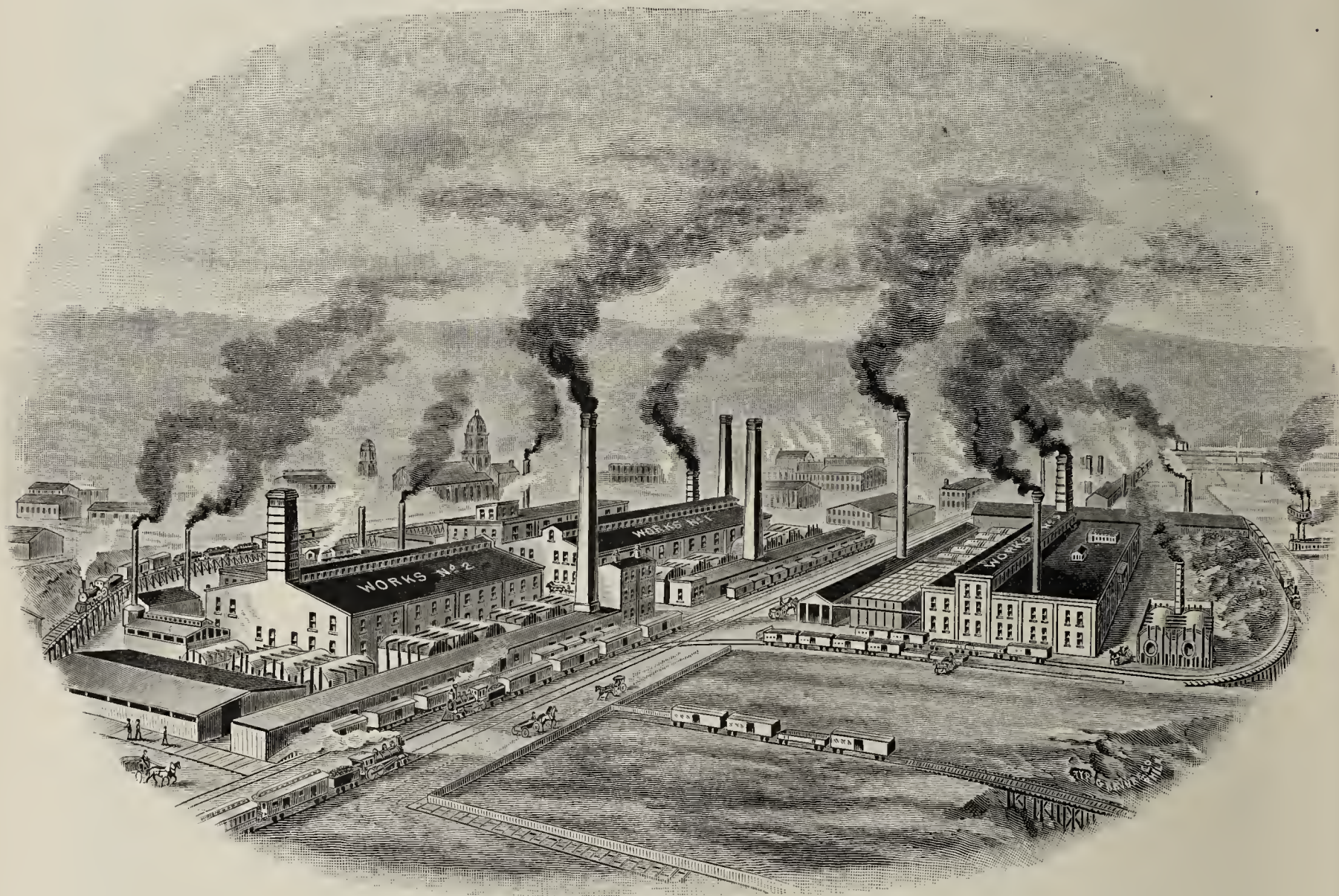
Pittsburg brickmakers are strong in numbers (there are nearly half a hundred of them), strong in financial resources, and strong in the spirit of good-fellowship, which, after all, is the most important factor in matters of hospitality, for the hearty hand-grasp and kindly welcome mean far more to the thoughtful guest than lavish entertainment.

That the Pittsburg contingent know how to extend the glad

We know of no city where the brick plants are located so near the business center, or in well-built residence districts, as they are there. This is due, perhaps, to the hilly surroundings. Standing down on the Point, where the old Block-house was first built, the city has grown back and up over the hills, leaving a brick plant here and there on a hillside to be surrounded by dwellings and factories. To reach the brickyards of Pittsburg one does not have to board a suburban train and ride ten, twenty or thirty miles out into the country. Not at all; just step on a trolley car—most any of them—and in a few minutes you will see the stacks and sheds that say as plain as words, "Here is a brickyard."

—A Great Fire Brick Factory.—

One of the oldest, largest and most successful fire brick establishments in Western Pennsylvania is that of the Harbi-



GENERAL VIEW OF THE HARBISON & WALKER CO'S STAR FIRE BRICK WORKS, PITTSBURG, PA.

hand will be fully demonstrated February 15th to 18th, when the clayworking clans will gather within her gates. The warmth and cordiality of the Pittsburg brethren are well known to the rank and file of the N. B. M. A. They have been in the "front row" at almost every Convention, and know the objects and purposes of our annual gatherings, and are therefore less apt to either overstep or fall short in any of the essentials. The non-essentials always take care of themselves.

The Pittsburg brickmakers are fortunate in many things. They have an inexhaustible supply of common clay, shale, and varying grades of fire clay at their very doors, and beneath its rich veins of coal—nearly every brick man can mine the coal with which he burns his brick, if he sees fit. Not only that, but they have natural gas and oil at many points near by.

son & Walker Company. The works are located between Twenty-first and Twenty-third streets, occupying three blocks. The original plant was established thirty years ago by parties from whom the present company purchased it a few years later and have operated it ever since. Subsequently they established extensive branch works at Woodland, Clearfield county, and Figart, Cambria county, Pennsylvania, all of which, as a rule, they keep going continuously the year through. They have extensive fire clay mines in adjoining counties, from which they obtain all the varying grades of fire clay necessary for the production of an endless variety of fire brick, furnace blocks, tiles, etc. In addition to these lines, they also make a variety of the fire-flashed building brick, which has become so popular for fine fronts.



A GREAT FIRE BRICK FACTORY—The Clay Washer—Getting in the Raw Clay—A Load of Calcined Clay.

The clays are brought in by rail and dumped in great piles, care being taken to keep each grade separate from the others. A large portion of the clay used at the Pittsburg works is calcined or burned in the crude state—that is, before it is pulverized and prepared for molding. This first or preliminary burning removes impurities and gives greater refractory qualities to the final product. For this purpose they have several calcining kilns or furnaces, which are simple tubular affairs some nine feet in diameter, inside measurement, with a thirteen and one-half-inch wall of fire brick, the upper portion of which is encased in an iron jacket. At the height of twenty-one feet there is an opening into which the raw clay is thrown. Each kiln has four furnaces, in which the heat is generated and then passed into and up through the clay. When burned, the clay

drops down and is taken out through two large openings at the bottom. Above the opening at the top the iron jacket tapers in and forms the stack for draft, extending up an additional thirty feet. The clays to be calcined are brought in on an elevated track that runs through the works on a level with or a little above the top of the kiln, so the clay can be wheeled from cars in barrows and thrown into the furnace.

—Making Fire Brick and Blocks—

Is largely hand work; machinery is used but little except in the preparation of the clays. For the best grades of ware great care must be taken to remove all impurities or rubbish that might be gathered en transit from the mine. This is easily accomplished by passing the clay through a washing machine—perhaps it had better be called a rinsing machine. It consists of a perforated cylinder some eight feet long and four feet in diameter at the large end, tapering off to about half that diameter at the other. It is suspended horizontally and half submerged in water, the latter passing in and out of



A GREAT FIRE BRICK FACTORY—A Section of the Hot Floor Dryer—A Repressing Gang—Glimpse of the Kilns.

a tank beneath it at the will of the operator. The clay goes in at the large end, and as the cylinder revolves is carried along through the water and discharged gradually at the small end, all soil and other soluble matter being thus removed. From the washer the clay goes to dry pans or wet pans, as occasion requires, is pulverized and pugged and then conveyed to a molding table, where it is formed into shape by hand and toted to the dry-floor. After the brick are partially dried they are repressed by hand and again placed on the hot floor, from which, in due time, they are wheeled to kilns.

At the Pittsburg plant they usually work fifteen or more gangs of molders, a gang consisting of one molder and two off-bearers. They have three hot floors, two 65x120 feet and the other 65x144 feet. The ware is all burned in down-draft or continuous kilns. They have seventy-two of the former, which consist of a series of chambers each holding 35,000 ordinary brick, one stack answering for six chambers. These kilns are burned with coal, the heat from cooling kilns being carried through an underground conduit and discharged into the chambers filled with green brick. They find the system very satisfactory and economical.

They have one continuous gas kiln, consisting of twenty-two chambers, each holding 17,000 brick. All of these chambers feed to one stack. The gas is manufactured from coal

slack and conveyed to the chambers through large iron pipes. Care is taken to have a chamber thoroughly heated before introducing the gas—otherwise thorough combustion would not take place. Their method of manufacturing and handling the gas is much the same as that described by J. W. Carson in his paper entitled "The Fuel Question," read before the Louisville Convention of the N. B. M. A., in 1893. It results in a decided reduction in fuel bills, but the first cost of generators, etc., is excessive, and for the best results the work must be continuous.

The products of these factories find their way into almost every State in the Union, and large shipments are frequently made into Mexico and South American points, while occasionally they ship to the eastern hemisphere, having sent several large consignments to far-away China and Russia. Their building-brick department is but a small part of their work, comparatively. Nevertheless, they make a great many fire clay building brick, all of which are hand-molded.

The works are in operation throughout the year, and visitors are seldom or never turned away. Mr. S. C. Walker, the President of the company—a very pleasant though extremely modest gentleman—said that members of the N. B. M. A. attending the coming Convention would be permitted to inspect the works, but intimated that he would prefer to have those who desired to do so arrange to make the trip together at one time, in order that their workmen might not be interfered with more than necessary.

—Grant Dibert's Works.—

As we have said, Pittsburg is a very old city. She has several old brickyards and a few new ones. Among the latter is the works of the Iron City Brick Company, which was built in '95 by Grant Dibert, who gives the plant his entire attention, or rather did until his neighbors elected him chairman of the Committee on Arrangements for the coming Convention of the N. B. M. A. Since then he has divided his time between the two, and expects to continue to do so till the Pittsburg Con-



BASE OF CALCINING KILN.



GRANT DIBERT'S PLANT—The Clay Bank—The Strata of Stone beneath the Shale—Building a New Kiln.

vention is numbered among the has-beens. One of the new school of brickmakers, Mr. Dibert has an up-to-date plant, equipped with two Phillips & McLaren dry pans, a Penfield pug mill, and No. 10 stiff clay brick machine, with a Raymond automatic cutting table, all of which work to perfection. Mr. Dibert makes 40,000 good side-cut brick a day, which are piled ten high on iron cars and run into a Wolff steam dryer. The latter is but eighty-four feet in length—as large as it could be made when built. Since then the clay bank has been cut away and converted into brick, till now he has the room and will extend it back some forty feet further, giving him much larger drying capacity. The brick are burned in ordinary up-draft open-top kilns—not ordinary, either, for the walls are four feet thick, the center of this wall being built of stone, which is quarried from beneath his shale. The shale is worked pretty evenly from top to bottom of bank. Being hard and rock-like in texture, it is blasted with dynamite and then conveyed in barrows over a trestle and dumped in a chute leading to the dry pans. Mr. Dibert has ten acres of this shale that runs from fifty to sixty-odd feet in depth, and below that a thirty-foot vein of blue stone, which is valuable for foundation purposes. It will be seen that Friend Dibert, though a



Beckett's Clay Bank.



Part of the Office Force of the Harbison & Walker Co., Pittsburg.

young man, may grow old in the business and still have plenty of raw material to keep the plant going indefinitely.

The works are located at Staunton and McCandless avenues, well up on a great hill, giving him the advantage of a down grade for most of his hauling—no small item, as his delivery is entirely by wagon. The plant is but a short walk from the Butler-street car line, but if visitors will do as we did—telephone Mr. Dibert before starting out—he will meet them with his rig and haul them up the hill. It is much easier than walking, and pleasanter, too, for Mr. Dibert is good company. The same can be said of all the Pittsburg brickmakers; they are social and clever to an extreme.

—A Soft Mud Yard.—

Not very far from Mr. Dibert's plant is the well-equipped soft mud yard of E. W. Beckett. We found Mr. Beckett, junior, in charge, and were accorded a hearty welcome. The peculiar thing about this plant is that it is located on a well-improved street. As will be seen by the accompanying cut of the clay bank, it abuts a row of nice residences, and while many thousand yards of good clay has been hauled away and converted into good building brick, enough remains to justify the continuance of the plant for several years yet. Mr. Beck-

ett, senior, is one of the old-time brickmakers, who believes that there is nothing better than a tempered-clay brick, and will probably continue to make by this process so long as he makes brick at all. Like his neighbor brickmakers, Mr. Beckett was fairly well satisfied with this year's business, prices being fair and the demand sufficient to enable him to dispose of all the brick made. Still, better things are hoped for. If the wishes of a majority are realized, a local organization will be one of the results of the National Convention going to Pittsburg; then old-time prosperity will prevail once more.

—Works of the Wittmer Brick Company.—

Our most genial neighbor, "Brickmaker to the President" J. C. Adams, accompanied the writer to Pittsburg for the purpose of visiting the brickyards there in the pursuit of information regarding shale, and the best way of working it. That the trip was both pleasant and profitable goes without saying. Both of us are indebted to the brickmakers of Pittsburg for many kindly courtesies. Indeed, they insisted upon putting their own affairs to one side and giving their undivided attention to us so long as we were with them.

"Jesse" visited several large plants and picked up many valuable pointers that will come in good play at his new plant near Martinsville (which, by the way, is now about completed), where he has a shale very similar to that about Pittsburg, and as he is a novice in handling this material, he is too level-



Setting a Clamp on the yard of J. W. Beckett.

headed not to appreciate the experiences of those familiar with it. Though a born and bred brickmaker, he does not "know it all."

Among the yards visited was that of the Wittmer Brick Company. This is an out-of-town plant, being located seven

brick in twenty to twenty-four hours, when they are stacked on trucks and taken to up-draft kilns, in which they are set forty high and burned with natural gas, which the company draws from its own wells.

Their brick are shipped entirely by rail. The kilns lie



J. W. BECKETT'S HOT FLOOR DRYER.

miles from Allegheny City on the Pittsburg & Western railway. Like most brickyards, it is picturesque, though not strictly classic in style. Located on a hillside, there are some propositions to contend with not met usually in brickyard architecture. The plant was established in 1884 by the Wittmer Brothers, Xavier and Henry, who had previously been engaged in the ice business and found they had considerable leisure time at some seasons of the year. Since entering the brick business they have had no occasion to complain on that score. Originally, the plant was equipped with a Martin soft mud machine and Whittaker dry press. The latter did its work satisfactorily, but the clay was not adapted to that process, so the press was discarded and a new Martin machine installed in its place. Thinking to pulverize and temper their clay with one process, they at first tried wet pans, but soon gave this up, and have since used dry pans, which proved a decided improvement.

Their clay deposits are extensive, and form a great hill on the side of which the works are built. The clay is taken from two or three different levels, the face of each bank ranging from thirty to sixty feet in height. That from the upper level is carted to a small platform and dumped into a chute, down which it slides and is deposited in a car at the bottom. The cars run over portable tracks, and are hauled in turn by horse and cable to the dry pans. After being pulverized, the clay is passed through a coarse screen (3-16 mesh), the tailings going back to the dry pans. After being pulverized, the clay goes into iron pug mills, where water is added, and thence into the machine. The brick molds are placed on spring trucks, holding five each, and quickly run to the dry floors, where the brick are dumped on iron pallets. The latter are simple sheets of iron, $\frac{1}{8}$ inch thick, 10x27 inches. They also have an apartment they call the sweat-box, in which the brick are piled twelve high. It is heated by natural gas, and dries the brick very rapidly. It is an emergency dryer, and is only used occasionally when they are in a rush. The hot floor dries the

some twenty feet or more above the level of the railroad tracks. So, to facilitate loading on cars, a novel inclined railway is used to convey the brick from kilns to cars. Two trucks loaded with brick are run onto a wedge-shaped car, the floor of which is level with the platform leading to the kiln. The



MARTIN WITTMER, Superintendent of the Wittmer Co's Works.

moving of a lever by one of the boys at the top starts the car, which runs slowly down to a platform along which the freight cars are lined. A loaded car, as it descends, pulls up the other with the empty trucks. The operation takes but a moment or or two, and expedites the work of loading very materially.

The works are in charge of Martin Wittmer, who, as Jesse says, is a brickmaker "from the ground up." They certainly make an excellent grade of brick, and to that fact Mr. Xavier Wittmer attributes their success in the business. His neighbors say, however, that Wittmer's success is due not so much to the quality of his brick—for they all make good brick—as to his farsighted and thoroughgoing business faculties. However this may be, all who know him agree that he is one of the kindest men in all the world. Associated with him and his brother in all their various enterprises is jovial D. C. Cawley, who needs no introduction to the members of the N. B. M. A.,

having been an active participant in nearly all our Conventions, his paper on "Burning Brick with Natural Gas," at the 1887 Chicago Convention, being the first elucidation of that subject. With such a combination of forces, it is little wonder that the Wittmer Brick Company is an important factor in the brick business of the Twin Cities. Their office is at No. 12 Federal street, Allegheny, where visiting brickmakers are always sure of a kindly greeting.

We have not mentioned the most extensive building brick plants of the Smoky City. There are several well worthy of more extended notice than we have space for now, so will reserve them for a subsequent issue.

Written for the CLAY-WORKER.

MODERN AMERICAN FRONT BRICK.—Fourth Paper.



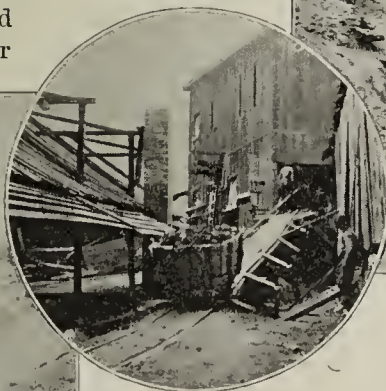
—Gaseous Fuel.—

NOT INFREQUENTLY one hears a clayworker express himself in regard to the use of artificial gas for burning clay ware. But these opinions are far from being unanimous. While one man may talk most enthusiastically about the great advantages of gas firing, another denies all its claims to practical value. Both may be wrong in the way they look at the matter; the one may claim too much, the other, perhaps, is denying too much. The subject is certainly a fascinating one and allows much room for imaginative speculation. Just think, says the enthusiastic person, of putting up a plain brick shaft with a grate at the bottom of it, filling it up with coal and setting it to produce gas, which may be piped to any place with but moderate expense. And the burning! Why, without almost any effort the finest burns are turned out, not a discolored or white-washed brick in the kiln.

But as conservative clayworkers we receive this statement with a grain of skepticism and prefer to look a little into the matter ourselves. And the best way to inform ourselves about the gas-firing systems is to ascertain what has been accomplished along this line. It will not take us long, however, to discover that, although producer gas is used to quite an extent in other



WITTMER BRICK CO'S CLAY BANKS.



industries, the application of artificial gaseous fuel in the clay industries of the United States is limited to a few instances. In fact, there is not a single gas kiln

construction offered on the market at the time of writing. We find that we must look to Germany for information, a country which has done so much of the experimental work tending to the progress of the clay industry.

There we find the use of gaseous fuel for the burning of the better classes of clay ware, as front brick, terra cotta, etc.,

steadily increasing, while it is considered out of the question for common brick. The modern gas kilns of that country have reached a considerable degree of perfection and are turning out uniformly burnt wares with a surprising regularity. Most of these kilns are of the continuous type, for which gas firing seems admirably adapted. Although there are intermittent, usually down-draft gas kilns, these latter are used only for the burning of high-grade ware, like floor tiles, etc. The continuous kiln is considered there the best for the employment of gaseous fuel. It has taken many years of persevering work to bring the German gas kiln to its present stage, and many were the disappointments connected with the earlier ventures. But to-day modern gas kiln construction stands on a solid basis, as is demonstrated by the large number of successful kilns in Europe.



XAVIER WITTMER.

As far as economy of fuel is concerned, the gas-fired kilns do not compare favorably with the ones fired in the direct way. It has been found by actual trial that the ratio of the fuel consumed by a continuous kiln fired with coal is to that of a gas-fired kiln of the same system as three is to four. That is to say, the gas kiln requires four tons of coal for the same result which is obtained in a direct-fired kiln with three tons.

This difference is not due to the combustion itself, but to the loss in generating and conducting the gas. It is easily understood that a gas kiln is more complicated than one of the ordinary kind, and hence its operation seems more difficult than it really is. The process of burning is the same whatever the kind of fuel. The only difference is that gas permits of closer regulation of the firing conditions, and that its combustion is more complete and regular. In a proper kiln the mixture of air and gas can be varied at pleasure and in a very short time. The gas and air in the modern kiln are admitted through a great number of openings, by means of

which an even distribution is effected. In burning with gas the same caution must be observed and the same care must be taken as with the ordinary firing; in fact, it may be claimed that closer attention must be paid to a gas-fired kiln. In burning a kiln by the direct method the kiln may be said to have a tendency to readjust itself; that is, after each fire the temperature is raised, but after a little while the heat commences to fall again towards its old level before the firing. For this reason, by firing in proper intervals and with ordinary care the kiln may be made to progress properly. But in the case of the gas kiln the flow of ignited gas is almost constant and no cooling takes place due to the admission of air through fire holes. Hence in the last stages of the burn the temperature must be made to rise and fall by adjusting the flow of gas and air so that the heat is gradually forced to the cooler parts of the kiln. In a gas kiln approaching finishing heat the temperature



may rise to the danger point in a short time, and alert watchfulness on the part of the burner is required. But this very delicacy of burning is one of the advantages of the gas-firing process, as it enables the operator to meet different conditions with ease, a point which is quite important for places where different clays and clay mixtures are used.

As to the results of the burning in the two kinds of kiln, we have no reason to expect any difference in regard to uniformity of burning and color. A well-conducted burn in a well-constructed coal-fired kiln can certainly not be inferior to that of a gas kiln, and vice versa, for the fuel is the same. In

temperatures, which are troublesome to attain in the ordinary kiln, are easily maintained in the gas kiln. These advantages must, of course, be paid for by the cost of the gas-generating plant and the extra expense for fuel. It is hardly possible to use a lower grade of fuel for producing gas than is already used in the continuous kiln, and hence no saving can be effected in that way. Nevertheless, it seems to the writer that a well-constructed, gas-fired continuous kiln could be made a commercial success in this country. Our kiln builders should pay some attention to this, so very important, subject. Without the use of gaseous fuel the continuous kiln is not very likely to be applied in the front brick industry to any extent.

The application of gas firing to the intermittent kilns, like our down-draft kilns, is much more difficult than it is in the case of the continuous kiln if the gas is to be produced at a main plant, from which it is conducted to the different kilns. Owing to the large area covered by a battery of down-draft kilns, the long flues through which the gas must be conducted are a great source of loss. The draft, artificial or natural, required to force the gas from the producer to the furnaces must be powerful, a condition which adds not a little to the first cost of a gas plant. Owing to the periodic character of the burning the kilns could not be started with gas unless hot air from a cooling kiln is drawn into the green kiln, so that there is a red heat before the gas is turned on. Without an arrangement of this kind the kiln would have to be raised to dark-red heat by means of direct firing. As regards fuel



WITTMER'S BRICK CO'S WORKS—Filling a Kiln. [See page 429.]

gas firing we use coal as fuel, the same as in the ordinary way. We distill from it all that can be burned besides all the other volatile matter. The gas coming from the producer contains carbon in the form of an inflammable gas, water, sulphurous and ammoniacal vapors. We cannot therefore, claim for gas-fired ware immunity from discoloration caused by the sulphur compounds, but we can claim for it that it is free from the obnoxious ashes, which are always carried over to the ware by the coal fires. This is a fact having quite a bearing upon the financial part of the manufacture of front brick, as every brickmaker knows the loss and annoyance caused by the fire ashes. Neglecting the question of full consumption, we can claim for gas firing the advantages, first, of better regulation and distribution of the fire gases; second, more complete and intense combustion, owing to the gaseous state of the fuel, and, third, freedom from fire ashes.

We know that in Germany gas firing is used mostly in connection with the continuous kilns, and it has been proven almost conclusively that it is the best method of firing for the continuous type of kiln. Gaseous fuel does away with the chief objection to continuous firing and makes it possible to burn in the continuous kiln higher grade wares. The flow of gas and air may be regulated to a nicety; the flame can be distributed uniformly throughout the kiln by arranging numerous openings for the gas to enter, thus tending to produce uniform burns, and ware is not contaminated with ashes. High tem-



WITTMER BRICK CO'S WORKS—From Kiln to Cars. See page 429.

economy, the advantage is with the direct firing, although the difference is modified by the fact that usually the ordinary down-draft kiln requires good fuel, while gas may be produced with a poorer quality of coal. To use gaseous fuel for a battery of kilns would result in quite a complicated apparatus, whose intelligent operation would certainly not be a very simple task.

Of course, like in the case of the continuous kiln fired with gas, the use of gaseous fuel in down-draft kilns would produce the same advantages—easy and exact regulation of the

fire, better and more intense combustion and no fire ashes. However, the simplest and most feasible plan would be to connect the generators directly with the kiln. This could be done without the heavy cost attending the installation of a gas plant. By this plan the ordinary furnaces are converted into gas producers. For instance, assuming that a square, down-draft kiln having, say eight furnaces on each side, should be changed to a gas kiln, we could do away with eight furnaces, leaving four on each side. These four furnaces we would have to make quite large in size, say two and a half times the height and twice the width of an ordinary furnace. They could now be connected with the bag of the kiln by a number of flues, perhaps four to each producer, controlled by dampers. All along the bottom of the bag air flues should enter below each gas flue and opportunity for the mingling of the gas and air should be afforded by arranging brick checker work within the bag. The air is best heated, for which purpose the heat of the waste kiln gases could be utilized very well by making use of a regenerative system. The flow of air through the respective flues into the bag should be regulated by means of dampers.

The burning of the kiln would now proceed as follows: For starting the burning in the cold kiln we could not use gas, even if we had it. Hence we would start firing in the orthodox fashion and build up a coal fire on the grate, which best is of the inclined type. The fire boxes should be provided with two doors, one on the side and one on top, the latter to be used only during the gas-firing stage. By the time the kiln has reached a low-red heat we could start to produce gas, and we would have a heavy layer of coals on the grates. The side doors are now closed up and firing is commenced through the top holes, which, of course, are kept covered between firings. As the layer of coal upon the grates increases in thickness gas is given off instead of flame. This dark, dense, smoke-like vapor on entering the bag meets a stream of hot air, mingles with it and flashes into flame. The burning proceeds in this manner, the flow of gas and air being regulated according to the requirements of the kiln. The higher the temperature the more efficient will be this system of firing. For low temperature it, like all gas firing, will not prove economical.

Such an arrangement thus briefly sketched is not at all infeasible; in fact, the writer has seen a kiln of this description in operation, burning high-grade vitrified sidewalk tiles to the satisfaction of the owner. For high temperature and regular firing without the wasteful cooling periods coincident with direct coal firing, occasioned by the cleaning of the grates, this type of kiln should fill the requirements. An advantage not to be overlooked is that a poor grade of fuel can be used, while a direct-fired kiln requires fairly good coal.

The use of gaseous fuel should be considered more seriously than has been done in the past. Gas firing enables the front-brick manufacturer to exercise a more complete control upon the burning process. Where coal is cheap a brickmaker should consider that by gasifying his fuel he gets it in better shape to apply it where and when he wants it, and hence the increased fuel consumption is balanced by the increased efficiency of the coal and the better regulation of the fire. On the other hand, where fuel is high the application of gas permits the use of inferior fuel, and this, together with the increased efficiency, should help to cover the difference. But the main function of gaseous fuel, it seems to the writer, is its relation to the continuous kiln. In regions where coal is a great item the gas-fired, continuous kiln must be the kiln of the near future, for it combines economy of fuel with excellence of results.

This may be all true, says the brick manufacturer, but show us a successful gas-fired brick kiln in the United States, give us detailed plans, estimates and figures. At this point the writer humbly confesses that he is not in position to do all this. He is willing to refer any inquiring clayworker to places where gas kilns are in actual successful operation, but as he is not a kiln builder he can only give his ideas without the data which is needed so much. It seems a pity that not more work is done in this country towards perfecting the gas-fired, continuous or semi-continuous kiln. Whoever does succeed in placing a well-designed construction of this kind upon the market is to be considered a public benefactor.

Before concluding this paper the writer will sum up the

advantages and disadvantages of gas firing as follows, viz.:

Advantages:

Close regulation of the firing, better and more intense combustion.

Use of poorer grades of fuel.

No fire ashes.

Disadvantages:

Higher fuel consumption.

First cost of equipment and expense of keeping it up.

Not suitable for low temperatures.

Close and intelligent attention required in operation.

Foreign gas-kiln builders have arrived at three important conclusions in regard to gas-kiln construction:

1. The gas must enter the kiln in a large number of small streams.

2. The combustion gases of a gas kiln must not be used for water smoking; for the latter process air from cooling-kiln chambers should be used.

3. A direct current of hot air, which is under control, must mix with the gas just before entering the kiln proper.

AMERICUS.

(To be continued.)

Written for the CLAY-WORKER.

A PIONEER BRICKMAKER.

THE FIRST PRACTICAL brickmaker on Long Island was Davis Graham, a Scotchman. He came to this country when he was about ten or twelve years of age. He went



WM. T. GRAHAM, the oldest Brickmaker on Long Island.

to work for Benj. Harris, at Tarrytown, on the Hudson. He afterward worked for James Woods and was with him when he first began to use coal dust in brick. He worked for him a number of years, molding brick by hand, then setting and burning brick. A captain by the name of Roberson, who was hauling cord wood to Mr. Wood's yard from Long Island, informed Mr. Graham that there was a fine clay bank and good facilities for shipping brick. After the brick business shut down he went on a tour of inspection, finding the clay as represented. He purchased the site and built a brickyard, molding the brick by hand and carrying them off and dumping them on the yard. When machinery came in use he equipped his plant with tempering wheels and a Varvaland horse-power machine. He was a first-class brickmaker and burner.

His son, William T. Graham, is now the oldest brickmaker on Long Island. He is the founder of the brick yard at Sag

Harbor. He formed a partnership with Mr. C. W. Payne and they organized the Sag Harbor Brick Company and run the plant very successfully for a number of years, Mr. Graham acting as superintendent. The plant was fitted up with an 80 horse-power Corliss engine and boilers, New Haven brick machine, Potts disintegrator and sander. Selling his stock in this company he started a brick plant at Southampton. This plant was fitted up with J. W. Penfield & Son's No. 7 plunger machine and disintegrator and sander, with a 25 and 40 horse-power engine from the Erie Iron Works. The clay was hoisted from the bank in a car with a steam hoister to the pit where the clay was made into brick. He run this plant for two years, then organized the Southampton Brick & Tile Company, acting as its superintendent for two years. He is a thorough brickmaker and understands how to handle men and run machinery so as to accomplish the best results. He is a first-class burner and his kilns are well burned.

There are now five brick yards on the east end of Long Island. Mr. D. C. Sage's yard has a capacity of about 25,000,000 per year. He has his plant fitted up with the Henry Martin machines and Little Wonder, with a Potts disintegrator. His brick are made on the pallet system and put on racks. He is making a very fine brick.

The demand for brick is very dull at present.

OCCASIONAL.

Written for the CLAY-WORKER.

BUTTON-HOLE TALKS.

"SAY, GATES, did you ever notice what a difference it makes in the looks of things as to what kind of eyes you look at them with? No, black eyes don't make things look black nor blue eyes blue, but sentiment does change or temper the whole scene. For instance, there's a little station up my way that the casual traveler passing by hardly sees or just barely notices, possibly begrudging the time the train stops there and thinking it absolutely uninteresting and that life there would be a burden. To me, though, to my eyes, the landscape is full of interest, and intense interest, too. The very air there is different from the air in other places, purer, sweeter and clearer. The sunshine is lighter and the brook gleams brighter. The vista out over the valley is clearer. The grass is greener and the flowers fresher. The mist in the distance is mellower and blends all the distant landscape, hill and dale, wood and meadow and flashing stream, into the peaceful landscape that ever soothes and heals my troubled spirit.

Even the old collection of sheds and kilns that others seem to think only an excrescence on the landscape are not to me just bricks and boards, but are days and years of toil and labor, of restless and persistent effort and endeavor, of youthful strength and exertion, of careful painstaking thought and experiment. Not of mine only, but of those who are dearer to me than myself even. Those are not ordinary rough bricks and boards. Oh, no. There are silk dresses and gloves and bonnets in there, Gates, lots of them, only you can't see them, but I can. They were put there by the dearest, sweetest little woman that God ever gave to a big, rough, overgrown man—gave him for his very own, with a great store of sweetness and love, with a wealth of self-denying, tender care, so broad and so great a store that she could deny herself the very things she knew would make her prettier in her husband's eyes, in the eyes of the one man whose admiration she prized, things that she knew would fill out and complement her graces and fill him full of pride and strengthen his love, if that were possible. Given with a great wealth of such unselfish love as could lead her to wear old dresses, plain dresses, cheap dresses and made-over bonnets, instead of the dainty beauties she so well knew where to get. All these she put in cheerfully and uncomplainingly and without the asking, into that great, ugly collection of sheds and additions, of warts and protuberances, that yet meant success or failure to the big, bluff man, whose greatest glory was that he had her for a

wife, that he had the glory of her love and the love of their children, and that he was the honest manufacturer of goods that should stand through all ages and should protect mankind from tempest and storm, from heat and cold.

Are not those sheds and kilns, brick and plank, radiantly beautiful when you really see what they are made of and when you remember that this rough old man sees in them not only these luxuries sacrificed, but that he sees also in them plenty and comfort for his dear ones in the future?

GATES.

Written for the CLAY-WORKER.

A GREAT SEWER PIPE MANUFACTORY.



EVEN MILES SOUTH of Akron, where the Ohio & Pennsylvania canal, the Tuscarawas river, the Baltimore & Ohio railroad and the Cleveland, Akron & Columbus railroad run parallel to each other within a distance one hundred feet wide, lies the town of Barberton, which takes its name from its founder, Mr. Ohio C. Barber, one of the most energetic and clear-headed business men to be found to-day, and who is the head of that gigantic industry, the Diamond

Match Company, whose largest plant is now located at that place. Previous to 1890 the spot which now marks this "magic city" (named thus from its phenomenal growth) was a plateau of as beautiful farm land as the eye ever rested upon. Early in the spring of that year Mr. O. C. Barber, Mr. William McFarlin and Mr. Charles Baird, all prominent Akron business men, recognizing the excellent shipping facilities and the fine site for a town, formed the Barberton Land and Improvement Company and purchased eight or nine of the largest and choicest farms in Norton township, Summit county, and all of which were located between the Baltimore & Ohio railroad, the Cleveland, Akron & Columbus railroad and the Ohio canal on the east, and the Erie railroad system on the west, and covering an area of several square miles. Within a very few months Mr. Barber and his associates had become interested in a variety of well-paying enterprises, and had decided to locate them in such a manner as to make a prosperous town the outcome of the concentration of factories and of the men therein employed. By way of fully utilizing all the advantages referred to above, the Barberton Belt Line railroad was incorporated, with O. C. Barber as President, E. M. Buel Vice-President and Auditor, John B. Wright Secretary, and Charles Baird Treasurer. This railroad is of the regular standard gauge track, and extends all around the town site, furnishing instant connection with the above lines of railroad, and tapping every factory in the place by means of switches. These railroad advantages at once gave to the place the most excellent facilities to enable shippers to send their product direct to every point in the country. This little town, which now numbers about three thousand souls, can to-day boast of having within its borders the largest match manufactory and the largest sewer pipe works in the world, and it is the latter industry that the writer wishes to describe to the readers of the Clay-Worker.

The National Sewer Pipe Company was incorporated March 17, 1890, with a capital stock of \$250,000, all paid in. The following are its officers: O. C. Barber, President; Chas. Baird, Vice-President; John B. Wright, Treasurer, and E. M. Buel, Secretary and General Manager. Bordering the Baltimore & Ohio and the Cleveland, Akron & Columbus railroads on the west, the mammoth factory, kilns, offices, apartment hotel, cottages, yards and trackage of the company entirely cover thirty-six acres of the corporation's choicest land. Nearly in the center of this stands the main building, 370x80 feet, which is built of brick and with three stories and base-

ment. On the west side of this building is a smaller one, which is devoted to the reception and the preparation of the raw clay, while on the east side of the main building are the kilns, and still further to the east, and running parallel to the works and kilns, are two miles of tracks used for unloading the raw material and in loading the finished product. These are arranged in such a manner around the yards and works of the company as to render unnecessary the double handling of materials and product.

One mile directly south of the plant the company owns three hundred acres of land from which their clay is obtained. This clay is of the finest quality, and abounds in almost inexhaustible deposits. Frequent tests have been made by the most eminent chemists, including Prof. Edward Orton, State

oughly tempered, the clay is then ready to be pressed into the different shapes and sizes for market.

To accomplish this, eight 44-inch steam cylinder presses, with 24-inch clay cylinders, are used, which mold the clay into every size up to 24-inch pipe. The company has recently placed in their plant a 52-inch steam cylinder sewer pipe press made expressly for them by Taplin, Rice & Co., and which is, up to the present time, the largest press used in any sewer pipe factory in the country. This machine is used almost exclusively for double-strength and extra large pipe.

From these presses the pipe is placed on the floors of the building for several days to dry, and where it is properly cut and trimmed. The drying system used is the hot air or Sturtevant system. The cold air is brought in the building, and is



Geologist, of Columbus, who have all declared it to be the best material for sewer pipe or paving brick in Summit county. The clay comes from an open mine, and is loaded direct to the company's own cars, of thirty tons capacity each, by means of a large steam shovel, which handles from three hundred and eighty to four hundred tons daily. The Barberton Belt Line Company carries this clay direct from the mine to the inside of the works, where it is side-dumped from the cars to the bins underneath. From here it is taken to the large dry pans, eight in number, four of which are manufactured by Taplin, Rice & Co., of Akron, and four by Turner, Vaughn & Taylor, of Cuyahoga Falls, Ohio. From the dry pans it is elevated to the third floor of the building, where it is carried over a three-thirty-seconds of an inch screen and into large bins, and from there to the wet pans or tempering machines, which are also manufactured by the above-named firms. After being thor-

heated by large coils of steam pipe, and is fanned by two immense fans, one at each end of the building, through a large air-duct the entire length of the building, and from which risers are placed at regular intervals of 20 feet, and carries hot air to the different parts of the building, and is properly regulated by dampers at regular points.

After the ware is thoroughly dried it is then ready for the kilns. These kilns are fifty-two in number, and are built in two straight rows of twenty-six each. They are all of the down-draft variety and have an inside diameter of 28½ feet each.

For the readers of the Clay-Worker to form some idea of the size of the buildings, the writer gives the dimensions of the various departments separate: Kiln sheds, 600 feet long, 100 feet wide; finishing rooms, 734 feet long, 80 feet wide, four floors; grinding rooms, 212 feet long, 40 feet wide, two floors;

there are eight press rooms, each 40 feet long and 20 feet wide; engine room, 50 feet long and 38 feet wide; boiler room, 56 feet long and 50 feet wide; stock rooms, 204 feet long and 60 feet wide.

The plant is run by a 750-horse-power engine made by the Putnam Engine Company, of Fitchburg, Mass. The boilers were manufactured by the Stirling Boiler Company, whose large and finely equipped plant is also located at Barberton. They are of 1,200-horse-power, and are equipped with the Roney patent stoker, which makes life worth living for the fireman of the boilers. The company operates its own electric light plant, which furnishes 1,000 incandescent lights for the shop, office, yards and for the thirty cottages owned by the company and occupied by their employees. The National Hotel is also owned by the company, and now used as an apartment house by many of the employees.

The sewer pipe made by the National Sewer Pipe Company is the vitrified or shale pipe, single or double strength, and with the standard or deep socket. Shipments up to the present time have been confined to the United States only, and have been made as far west as Utah and Texas, although the bulk of the company's business is done in the States east of the Mississippi river. A large amount has also reached the New England States, and, on account of its superior quality, is sold as far south as Jacksonville, Fla.

The company employs on an average two hundred men the year round at comfortable wages. An average of twenty-five cars a day are loaded and shipped during the busy season; this number, however, has frequently been doubled in one day of ten hours.

In all disinterested tests that have been made, the National has proved its superiority, both in crushing and in absorption. In addition to manufacturing Akron standard sewer pipe, the company also makes and deals in wall coping, hollow building blocks, and paving brick, and, having found a good bed of fire clay, they expect in the near future to go into the manufacture of fire brick and all kinds of fire clay goods. In this event ten additional thirty-foot kilns will be built, four of which will be used for fire clay goods and six for sewer pipe.

Written for the CLAY-WORKER

THE DEVELOPMENT OF HOLLOW BLOCK MANUFACTURE.—Eighth Paper.

BY E. G. DURANT.



IN OUR LAST PAPER we endeavored to show what results might be produced in the use of five block-forming dies and eight ornamenting roller dies, by no means exhausting the subject, but barely introducing it. We stated in closing that a list did not complete what we considered the smallest outfit necessary for the successful prosecution of the business. With no competition in the same line of wares, and with a considerable tributary territory, one might make a good beginning with them, and add other dies later. When, however, one has a suitable manufacturing plant, including buildings, power, clay-preparing machinery, drill and kilns—all of which are essential to the working of a single die—unless a trade can be established for all of this limited line of goods which he can produce, he will naturally complete his outfit, and in doing so add largely to the acceptance and popularity of his product. There are some truths connected with the conduct of a clay manufacturing business which may be coined into axioms, and among them we would include the following:

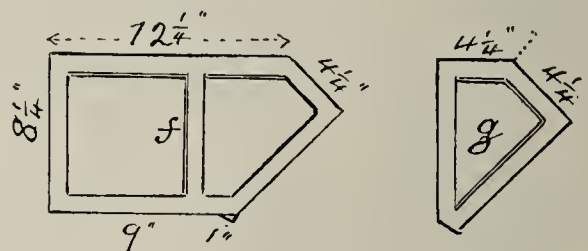
(a) As freights paid to the consumer of his wares increase the profits of the manufacture are likely to diminish relatively, and as a corollary to this,

(b) Two customers at home are as good as three abroad. We will not swear to the exactness of the proportions, but we are not far from the truth.

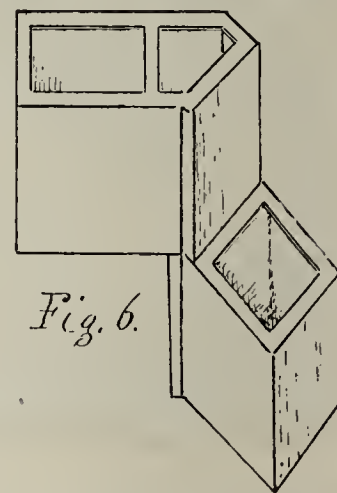
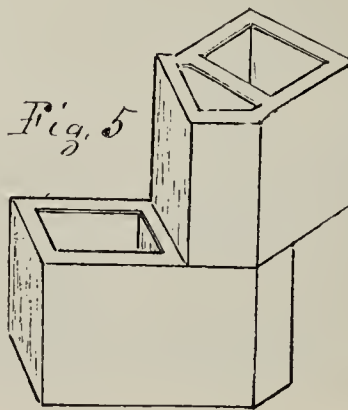
Now, to apply these axioms. The manufacturer of clay building material should aim to have a good fighting chance for the furnishing of material for the erection of every new building in what may properly be considered his district, and this may be defined as extending to a line where his freights are the same as those paid by his nearest competitor. One's object then should be to secure the largest possible clientage at home. We found in St. Louis a pushing terra cotta man who seemed happy over the fact that he was shipping several orders into northeastern Wisconsin, but we knew that quality and style of goods being considered equal, our St. Louis friend, like Jones, the scale man, "paid the freight;" at any rate the difference between Chicago's cheap water freights to the same point.

A is building a \$1,000 cottage and B a \$10,000 mansion. Our block manufacturer will not be likely to sell both the same designs of goods. He needs a line of designs to meet the requirements of both and experience says that better percentages of profit are as a rule made on the highest grades of goods.

It will be remembered that in the list of forms given only right angle corners were provided for. A pair of forming dies is necessary for the production of blocks of any other angle. Such a pair is now shown, having an angle of 45 degrees and



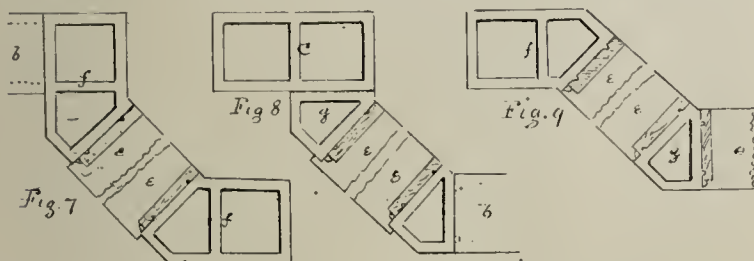
designated as "f" and "g." "f" would be useless when abutting against a wall opening without the use of "g" in each alternate course. While "f" only is required when laying an unbroken wall, it only needing that the block be reversed in laying each alternate course in order to secure a broken joint and the requisite lap upon each other, as is shown in Figs. 5 and 6, the first of the two showing their use in constructing an outer angle and the second an inner. In Figs. 7 and 8,



which follow, blocks "f" and "g" are shown as used against a window opening, a cross section of the window frame in position being also shown. Each of the figures showing an alternate course, here the blocks answer the purpose of both angle and window casing blocks, while in Fig. 9 "g" is shown used as a mullion casing in a bay window. To accomplish the results stated the blocks must be laid as seen in Figs. 7 and 8. A right angle projection of four inches is formed by "f" as it leaves the body wall, and from this the 45-degree angle springs. If laid as shown in Fig. 9 a special window block is required, which block is not included in our list of "indispensables" because very excellent results can be had without it, and we are only presenting now the actual necessary forms.

We stop a moment to call attention to one feature con-

nected with the construction of bays, the use of hollow blocks, viz.: It is entirely feasible, and is good practice, to project a hanging bay made from them and support the same with wood

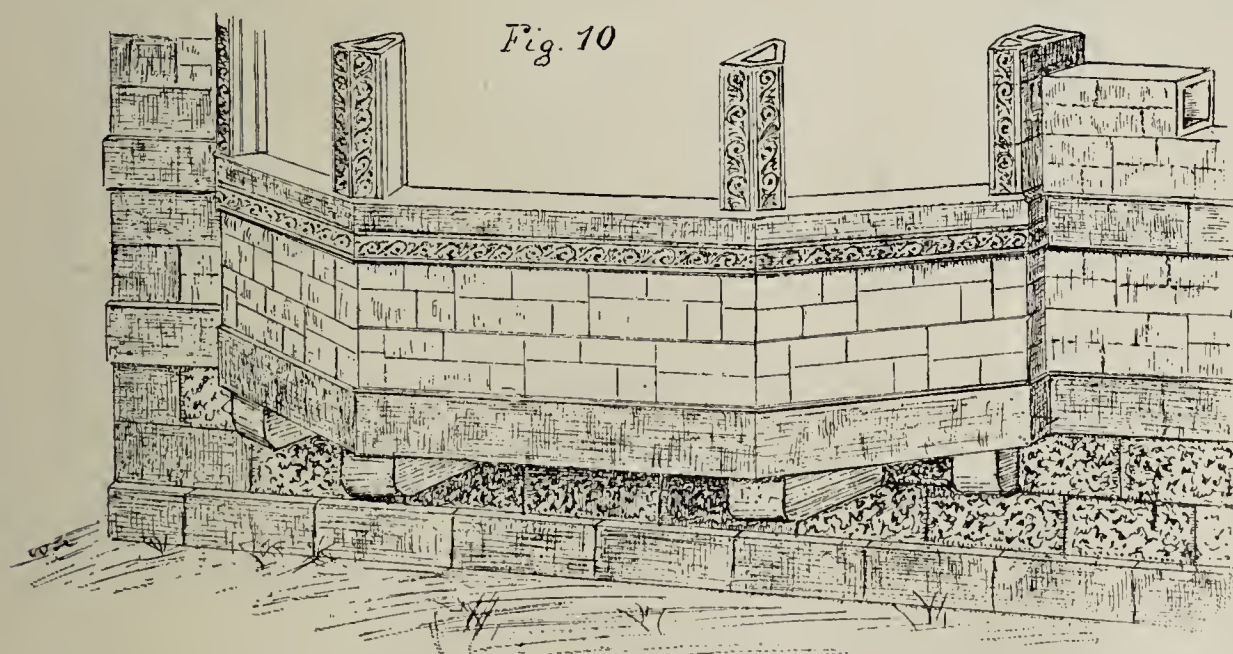


brackets, because of both lightness of our material as against brick or stone for such use. We might, if thought best, make blocks with their walls but three-fourths of an inch in thickness, instead of one inch, but we do not deem this necessary, since with inch walls the load imposed on the timbers by the masonry in a large bay projecting twenty-six inches and having a width of eight feet would be not over 1,300 pounds.

Such a bay would cost less and yet be more satisfactory every way than the zinc-covered affairs, which are so largely made to do duty on even first-class brick and stone structures in our city fronts, both business and residence, which, while many of them are tasteful enough, are still out of harmony with the substantial appearance of a wall composed of masonry. Of course, iron supports could be given to first-class work, but we are now and have been so far in our treatment of building construction referring to the most simple and inexpensive methods and to modest-cost structures. Let it be remembered that the weight of block masonry is not over four-tenths that of brick, stone or hand-made terra cotta, and that greater transverse strength is found in them than in brick, because of the length of the blocks and the consequent longer lap upon each other.

In the use of stone and terra cotta such bays are sometimes projected and are entirely of masonry, but at great cost and of small dimensions, and these require very heavy main walls for their support.

Another point may be mentioned here connected with bay-window work. The opening in the main wall required for their construction can be much more easily and inexpensively arched or bridged than when brick or stone are employed. Strain rods passing through the blocks, save the usual end

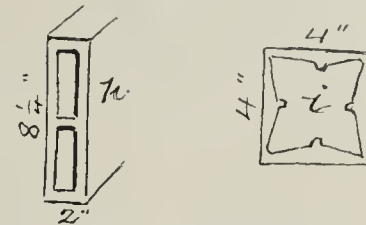


thrust upon the wall, and simple methods of trussing by passing rods through the vertical openings in the blocks may also be employed, and by either method better results can be obtained than in the use of other masonry material. We shall refer to this more in detail later. Our illustrations of block walls have so far been of the simplest character. Such work

as is admissible in the walls of five to seven-room dwellings, costing complete from \$1,000 to \$1,500, depending upon proximity to block manufacturer, character of interior finish and fixtures, etc. And we now present a section of a hanging bay window that may be included in such class of structures.

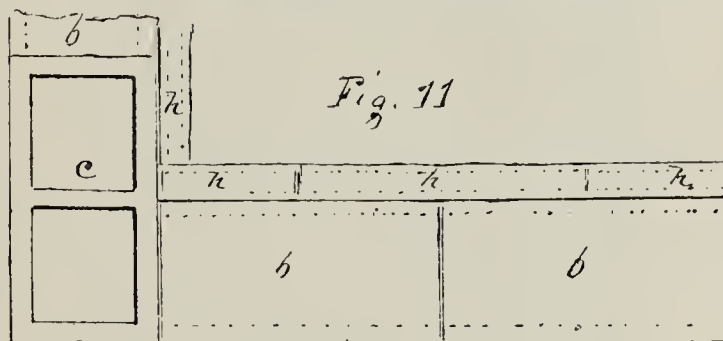
To complete our list we now present two other block forms, designated as "h" and "i." The first is used mainly as a "back-

ing" block, though it has several other uses. Its walls may be either one-half or five-eighths of an inch thick, as the manufacturer may prefer, and depending somewhat upon the quality of his clay. The second block, "i," is the form in which the



lap-joint pieces emerge from the press. Each side of the block representing when cut to the right length (usually six inches) a complete joint block. Being very light, it is found necessary to make the die a double one; that is, two blocks are run out at the same time, so that every six inches of stream makes eight joint pieces. The blocks are scored at the corners and a gentle tap breaks them apart after burning.

We have so far shown only eight and one-quarter-inch walls, except as a double course of blocks was shown in a basement wall. An eight and one-quarter-inch wall is heavy

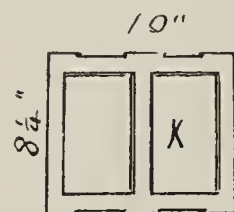


enough for any ordinary two-story structure; if a three-story a ten-inch wall might be desired for the first story, and here our block "h" comes into service. In Fig. 11 a ten and one-quarter-inch wall section is shown, and it will be evident that in the use of blocks "a," "b" and "h" walls of any thickness may be constructed, beginning at eight and one-quarter and advancing by two-inch additions. Such a ten and one-quarter-inch wall is a very excellent one for three reasons, first, as furnishing a double set of chambers; second, the inner course of blocks being laid to break joints with the outer course insures great strength against any lateral strain, and third, if any person is found skeptical as to the perfect safety of a single-chambered block as security against dampness being communicated to a finished interior, the double-course wall ought to dissipate any such doubts. Block "h" is also as satisfactory as "a" in filling in between floor joints, and can be used at a

saving for this purpose. It is also an excellent cellar paver and may be laid to secure a dry floor in a basement, otherwise hard to be secured. It may be a little out of place here to refer to the use of "h" for an interior finish, as we shall treat this matter at length later under its proper head, but we will say in passing that with the simple method of imparting a

glazed finish to blocks, referred to in the October paper in the presentation of the special features found in the improved block machine, that it will be entirely practical to so finish the face of "h" that for very many uses no subsequent finish by plastering will be required, and we expect to see the day, and that without waiting long, when such finish will be freely employed in a large class of buildings. The great attention which the publishers of the Clay-Worker and of other clay journals are now giving to the subject of glazes and the graduating of ambitious young men from under Professor Orton's training at Columbus are prime factors in encouraging this hope.

Another method of forming a ten-inch wall is in the use of a single block $8\frac{1}{4} \times 10$, as shown, but this block is not included in our list of those essential, because the "h" blocks enable us to dispense with it.



Having now given and commented upon the use of each block form in our list of "essentials," let us sum them up

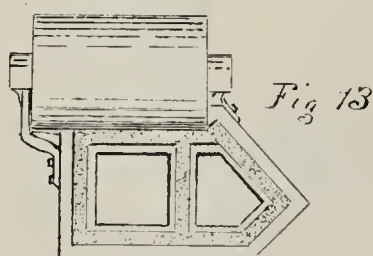
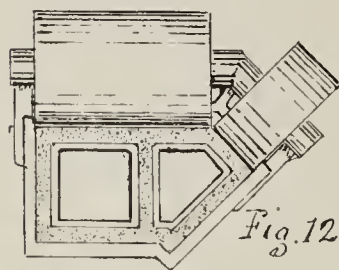
and bring them before us in a body:

- One wall-body block, $4 \times 8\frac{1}{4}$ inches, designated "a."
- One wall-body block, $8\frac{1}{4} \times 8\frac{1}{4}$ inches, designated "b."
- One corner block, $8\frac{1}{4} \times 16\frac{1}{2}$ inches, designated "c."
- One water table, $5 \times 8\frac{1}{4}$ inches, designated "d."
- One window sill, $5 \times 8\frac{1}{4}$ inches, designated "e."
- One 45-degree angle block, two-cored, designated "f."
- One 45-degree angle block, one core, designated "g."
- One backing block, $2 \times 8\frac{1}{4}$ inches, designated "h."
- One joint-piece block, double stream, 4×4 , designated "i."

Total, nine forming dies.

In this list we have assumed that the forming dies would be made to do duty both in the production of plain and ornamented blocks. This may be done by using a piece fitted to fill in and replace the piece taken out of the die spell. When fitting it for the reception of the ornamenting roll this piece may be made adjustable, in order to take up wear, if desired. We are now referring to the single dies used on horizontal machines. It will be understood that the finishing die, used on the vertical machine, is used for ornamental wares only, and is removed when plain wares are being produced.

It seems desirable at this point to finish up our list of ornamenting roller dies to match up our list of forming dies, as we have to this time only made provision for the first five blocks on our list. Notice in Figs. 5 and 6 that the angle block "f" sometimes needs ornamentation on its longest face; that is, when used for forming what may be termed an outer angle. For this twelve and one-fourth-inch face we need rolls having that width of face to match the rolls already provided for "a," "b" and "c," that is, rolls having broken-rock faces, tooled faces and ashler faces. In Fig. 12 we show an "f" block emerging from the forming dies with such a twelve and one-quarter-inch roll in position, and also with a four and one-quarter-inch roll set at the proper angle to treat that width of

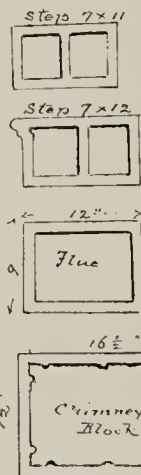


face. We already have such rolls provided for our casings and can use either the tooled face or the scroll design, as we may ornament for wall or casing, but we require two more of these four and one-quarter-inch rolls, viz.: A rock face and an ashler, in order to be able to match up all the wall blocks.

When it comes to the treatment of the nine-inch face (the inner angle of "f") the twelve and one-quarter-inch rolls may

be used, in which case the outer end of the roll is set over at the outer end, as shown in Fig. 13.

Angle block "g" is ornamented in the use of any two of the four and one-quarter-inch rolls, used in the same manner as is shown in Fig. 12.



Summing up the ornamenting rolls required and named we have:

Three with $8\frac{1}{4}$ -inch width face for blocks "a" and "b" and ends of "c."

Three with $16\frac{1}{2}$ -inch width face for block "c."

Three with $12\frac{1}{4}$ -inch width face for blocks "f" and "g."

Five with $4\frac{1}{4}$ -inch width face for blocks "c," "f" and "g."

Total, fourteen rolls.

In closing we will mention three other block forms which will commend themselves to the practical man. These are not ornamental blocks, but enter into construction. We name, first, a block for a common door step, 7×11 inches. A better one is shown with a molded front, 7×12 inches. (Outside cellar steps may be made from $8\frac{1}{4} \times 8\frac{1}{4}$ plain blocks cut to proper length for the purpose.) Second, (if the manufacturer has a fair fire clay) a chimney flue lining. A good size is 9×12 . Third, a chimney block to receive the flue lining, leaving an air space between, as shown, size $12 \times 16\frac{1}{2}$ -inch.

We would especially emphasize the desirability of producing both flue and chimney blocks. Steps can be made of wood, as is done in a great majority of cases, but a good chimney block is so far ahead of any other material that it should not be allowed that anyone building a block house be obliged to fall back upon brick for a chimney. And there is no good reason why, for houses of lumber, there should not be created a good demand for chimney blocks.

We shall, under the head of "Chimneys," give this subject the attention it richly deserves.

Written for the CLAY-WORKER.

PRACTICAL EXPERIENCE BURNING COMMON BRICK.

Burning brick and the way to do it most economically is something that always interests the brickmaker. One of the best ways to economize is to have a first-class burner. Those who let a few dollars stand in their way pay dearly for their whistle, for on the burner largely depends success. Here stands a kiln of brick to be burned, and if in the hands of a skillful, careful burner all is well—no need for worry. He lights his fires and goes slow for a time, so as not to sweat or soften the brick till they are dried through and through, and then proceeds to raise the heat on the kiln. He frequently inspects the top of the kiln to see that every spot on the kiln is working and properly steaming. When the kiln is dried off sufficiently he will again inspect the top of the kiln to see that it is thoroughly heated, so as to have no back draft to deter the progress of firing. These precautions are necessary to secure good results. A good burner never takes unnecessary chances; he must know what he is doing at every stage of the burning. When his kiln is ready to raise the heat, he will do it as fast as the conditions will permit. To use the brickmaker's phrase, when the kiln is evened up, or the heat raised to a hard-brick heat, he will watch the top to see when the settle begins, and the bottom to see that the heat is even and a sufficient amount of it. You can always be sure of good results from the hands of this kind of a burner.

Not long since I was passing by a brick plant. Steam was flying through the shed, and curiosity led me to take a look inside to see them burn. I asked the man who seemed to be in charge for the foreman. He informed me he did not know where he was, but supposed he was "somewhere around." With his permission I inspected every arch; they were not even, some being too hot and others as black as a smokestack.

It was easy to sum up the results. Here stood a kiln of brick that, if properly burned, would be worth \$2,000. It was not worth a third of it. The loss on this one kiln would pay a good man half his year's salary. Is that kind of a foreman the sort of a man to look after this, the most important part of the work? Isn't he dear at any price? This kind of burning is what makes cold spots, pale, cracked and crooked brick, but this is not where it stops. There is a brick building to be put up. The contractor examines the brick and finds they are not up to the standard. The first thing you see is brick coming from some other quarter. Does it pay?

I was on another yard awhile back where they were molding brick. The corners were not filled out, and when they were dumped on the yard they were wedged. I asked the foreman if that was the right way to mold brick. The remark he made me was that he would burn the corners on them. This remarkable genius has made from the 20th of May to the 1st of November 400,000 brick. He has completely burned the corners off the machinery.

G. O. RIGHT.

Written for the CLAY-WORKER.

PAVING BRICK FOR COUNTRY ROADS.

By THOMAS S. McCLANAHAN, ENGINEER.



FOR THE PAST FEW YEARS an all-absorbing question has been good roads and how to make them and maintain them, and what may seem strange at first thought is that that part of the community most in need of them and would surely derive the most benefit from them is, even at the present time, indifferent in regard to the matter of good roads, while those who love pleasure, such as driving either the well-trained horse or the expert rider of the wheel, these are the ones who are most in earnest and really want good roads for the year round. Now, this seeming indifference may be explained in this way. The farmer knows quite well that he of all others needs good roads and that for the greater part of the year, but he also knows just as well that he will have to pay for them, while the lovers of pleasure spoken of above expect to have their fine drives and pleasant spins on their wheels on an excellent road made, if not altogether, in the most part by other parties. And now, as the farmer seems to be the one most in need of good roads, notwithstanding he may under existing circumstances seem to be somewhat indifferent, it may require a little education, or in other words, set them to thinking, and that in the right channel. Therefore, let us begin with what can and will, if properly done, make a fair road for the greater part of the year, that is, thoroughly tiled road; and in order to obtain the best results in this kind of a road we must have it carefully surveyed, stakes set and profiles made for three lines of stakes. In all country roads of the ordinary width one line in the center and one fifteen feet each side of said center line, the water-flow line of the center line to be three inches lower than either of the side lines and all of the lines to be below the frost line, center line to be six inches and side lines five-inch pipe, and where the ground is very wet increase the size of the center pipe. This layout has special reference to flat prairie; hillside may require a different layout. Have good outlets for each and every pipe and have them well protected, so that the outflow will never be checked; discourage all plowing or throwing up of any part of the road, but encourage all rolling when the soil is in proper condition from fence to fence or the entire width of the road. Then so far as the financial interests of the farmers are concerned, this is their road, so far as the mere matter of dollars and cents are concerned. This will be a good road ten months in the year and every year get better by use.

To make the above road will require about \$700 per mile and no repairs only as stated above, to roll when in proper condition for packing. This kind of improvement can be made anywhere in the State, as there are tile plants in most every county.

The question now arises, Are permanent hard roads

through the country needed if the above will satisfy the desire of the individuals who have no other thought than to increase their bank stock and grow rich in money? We answer the question by saying yes. First, that we may make a residence in the country on the farm as pleasurable and pleasant, yea, even more so, than in the village, town or city, and thereby turn the tide of emigration from the city to the lonesome-looking and what was once the happy home of the farmer, but now deserted country home. Fill up the country schools with pupils, so that we may have what we once had, full schools with first-class teachers (the schools now being so small that it is hard to induce good teachers to go to the country), and our country churches with earnest and zealous members, that there may be even chances in the country with the village, town or city of climbing as high in knowledge and social advantages as it is possible for citizens of any city to enjoy, and this can be obtained by the resident in the country only by having roads which are not only passable, but good for horse, wagon, buggy or wheel and that for the entire year. Second, the times when the natural earth roads are impassable are just the times when the farmer has his leisure, as the same



THOS. S. McCLANAHAN, Monmouth, Ill.

workings of nature that makes the roads impassable, such as rain, frost and thaw, put also the farm and fields in a condition that would neither be pleasant or profitable to pass on or over. We think that nature is now trying to teach the farmer that now is the time for manual rest and mental improvement, such as can only be obtained by having free and easy access to the best libraries and lecture courses and coming in touch with his fellow-men; that it may make it possible for him to attain the heights in knowledge and avail himself of the social advantages which the Creator intended that all should enjoy and be a great, good, broad and wise man. These are blessings which are over and above a money valuation, and it may cost more to obtain them, but once obtained we then have the value of them. And I say right here that if money valuation alone is taken into consideration there never will be many miles of hard, permanent roads built through the country.

That the above privileges may be enjoyed we must have roads which are not only passable at the rate of one-half a mile an hour, but such that transportation over them may not only be speedy but pleasurable in any or all kinds of conveyances from country to city or city to country any time of the year.

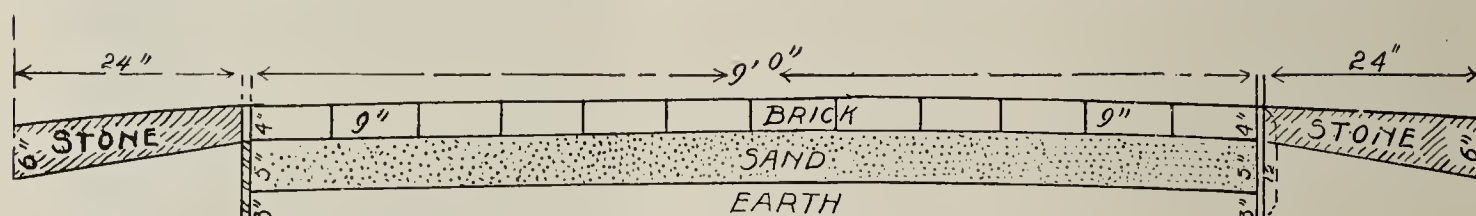
Third, we want good roads for another purpose or line of education; that is, if we have nice, clean, well-kept roads in

all kinds of weather the travel on same will be increased and the land-owners along the lines of these roads will very soon conclude that their fences, fence corners, barns, outhouses and especially the dwelling house and every surrounding must be kept in all respects neat and nice, the surroundings will be entirely changed, home environments so pleasant that the families are not only satisfied to remain on the farm, but city people want to move to the country. This may look some like balderdash, but the writer of this paper lived on and still owns a good farm only four miles from the city, when the roads were good, but a long way when they were bad. Eight years ago I moved to the city for the purpose of having city privileges, but am trying hard to get a good road out as far as my farm, so that I can move back and enjoy life once more, for I have been homesick all the time in the city, and more so when I drive into the country and see once-pleasant homes occupied by a transient population and see school rooms with only two to five pupils where once there were twenty-five to sixty.

We have now determined that we need, and in order that we advance in all good, must have hard roads, instead of the tiled roads first spoken of, which are not yearly but monthly. We will now make some comparisons of the different kinds of hard roads in order, if possible, to find which is the cheapest and best. As has been stated many times before by different writers on this subject of hard roads, we have neither trap, granite or gravel from which to build them. We are therefore limited to the limestone, which we have in this prairie country. This is by no means a satisfactory material with which to build roads. Estimating from what has actually been built in this neighborhood, the cost of a crushed-limestone road will be as follows:

—Specifications for Putting Down and Making Road.—

First, large flat stones, laid on their flat sides to a width of eight feet, this covered with screenings to fill the interstices completely; then this covered with crushed stone to a depth of eight inches and extending six inches over each side of flat



Section of one course Brick Paved Country Road.

stone, now making a roadway of nine feet wide; then grade up to sides with earth rolled with a seven-ton roller; then it is ready for travel. The cost of this is 85 cents per lineal foot. This is making no allowance for sub-grading. Total cost of making one mile of this road is \$4,488. Then to keep it in good repair it must be repaired at least twice each year at an expense of 10 cents per lineal foot, or \$528 annually. Supposing this road to be kept in use for the term of twenty years, it would give us the total of \$17,160. Do not, my friends, hold up your hands in holy horror at this terrible cost, for we are spending nearly that much on dirt roads in plowing and scraping and hauling to one place this spring and probably the same dirt next spring back to where it was the year previous; and then the hundreds of thousands we are spending in wooden culverts and bridges and then have nothing but mud when it is wet.

Now, in regard to the matter of using brick for country hard roads. The first question to be answered is, Will it pay? And now in order to find this out we will compare it with the cost already found on the stone road for a period of twenty-five years.

—Specifications for Building Brick Country Roads.—

First, I would recommend that the road, before it is improved, should be as carefully surveyed as a railroad, with plans, profiles and specifications. The importance of the road being the basis to determine the maximum grading to be done and if for heavy traffic, then the grades should be reduced as much as possible, not to exceed a foot and a half to the hundred feet, and where the road is to pass over low, boggy earth it should be thoroughly tiled, at least as thoroughly as I suggested in the former part of this paper, and when fills are to be made this, as well as the tiling, should be done at least one year in advance of the brick part of the improvement.

Having now the fills settled and the boggy places dried out, and having, as we suppose, the proper grade, we run with transit two line of stakes eleven feet apart, the center between said lines being the center of roadway; excavate a space nine feet wide between said stakes; this will leave a line one foot wide inside of each row of stakes, so that they need not be molested. Let this excavation be five inches deep, with perpendicular shoulders, each side sub-grade to have a crown of two inches from center to sides. Then set one-inch by twelve-inch

pine boards for curb as follows, setting bottom part three inches below bottom of sub-grade and top nine inches above top of sub-grade; this curb to be solid against banks of excavation and the space between curbs to be nine feet. This forms the brick part of the roadway. After curbs have been set and thoroughly tamped at backs, then roll sub-grade enough to thoroughly settle and impack the grade; then spread a layer of clean, sharp river or bank sand, free from loam or dirt, to the depth of six inches and tamp with tamper made as follows: Twelve-inch square and two-inch thick oak, with a handle four to five feet long. The tamping must be done evenly, so as to have the density of the sand at every point the same; then there will be no settling of the brick at one point more than another. Then cut crown on sand with a template.

Set on the edge and at right angles to curbs a single course of brick, size three by four by nine-inch, setting them close, end to end and side to side, and when they are finished they will be one inch above top of curbs. Then excavate a space two feet wide outside of curbs, tapering from curb down to a depth of six inches, leaving the shoulders against curbs, and fill this space with crushed stone to a depth of six inches, which will be two inches above top of curb. Then cover both brick and stone with sand, clean, sharp and dry, and sweep until the interstices are all thoroughly filled; then roll until the whole road is solidified. Finally cover with one-half inch of sand.

The brick to be used in the above must be square on their end, straight on their sides, free from knobs or cracks and thoroughly vitrified No. 1 paving brick.

The entire width of road should now be graded so that it would be easy to get on and off of hard road, and in good weather, when the ground is settled the side roads will be used and thus save the wear and tear of the hard road. From what I see and know of the endurance of such brick as above named, you have a road good for forty years, without any

need of repair except the crushed stone part, which is used particularly for a curb.

The expense of one mile of this kind of road thirteen feet wide is:

Excavation, 1,300 cubic yards	\$156.00
Curbing, 10,560 feet	179.52
Paving, 15,840 square yards brick	9,504.00
Sand, 880 tons	592.00
Spreading sand and laying brick, 5 cents per yard..	792.00
Crushed stone, 264 tons at \$1.50	400.00
Engineering expense	50.00

Total \$11,653.52

The brick made as above stated and the specifications followed out closely, then and only then have we a road fit for traffic, pleasure and beauty to the country through which it passes, and also as far as dollars and cents are concerned the cheapest that can be built, except the first road spoken of in this paper, which is a tiled road and good for only part of the year. Give me the brick road.

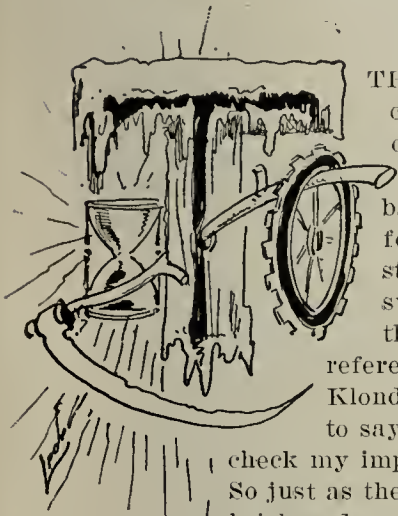
DON'T WORRY.

Don't worry about something that you think may happen to-morrow, because you may die to-night and to-morrow will find you beyond the reach of worry. Don't worry over a thing that happened yesterday, because yesterday is a hundred years away. If you don't believe it just try to reach after it and bring it back. Don't worry about anything that is happening to-day, because to-day will last only fifteen or twenty minutes.

Don't worry about things you can't help, because worry only makes them worse. Don't worry about things you can't help, because there's no need to worry. Don't worry at all. If you want to be penitent, now and then, it won't hurt you a bit to go into the sackcloth-and-ashes business a little; it will do you good. But worry, worry, worry, fret, fret, fret—why, there's neither sorrow, penitence, strength, penance, reformation, hope, nor resolution in it. It's merely worry.—Edinburgh Scotsman.

Written for the CLAY-WORKER.
EXPERIENCES IN ALASKA.

The Clay-Worker's Quaker Correspondent Seeks Gold on the Klondike.



THOSE WHO have given such things consideration it is well known that it is only necessary to breathe in a pestilential atmosphere to swallow the bacilli or microbes that later will transform your healthy body into a fever-stricken condition. Like many others, I swallowed the doses given out gratis in the daily bulletins of the newspapers in reference to the wonderful strikes in the Klondike. Clearly, as Colonel Sellers used to say, there was millions in it! I could not

check my impatient nature to be up alongside of it. So just as the days were longest and the dust in the brickyards seemed thickest, I, with three others, packed our traps and set our faces towards the Northwest Territory to study the geography of our great and glorious country.

I would like to state right here, in order to relieve the publishers of the Clay-Worker from any slur provoked by men who missed the usual Philadelphia letter, that they were not instrumental in my going. They did not give me a round letter of credit and say in confidence, "Go and if you see a good opportunity of establishing a brickyard on the summit of Chilkoot Pass or an opening for a brick plant in Dawson City wire us and send for more money whenever necessary." No; they have too much good sense for that.

I started out a free agent, with heavy underwear and a light pocketbook, traveling by way of Pennsylvania, Ohio, Illinois, Wisconsin, and halting at St. Paul long enough to buy a hunting knife, a 30-30 Marlin and a hundred bend heads, or dynamite explosive cartridges, and a soft-shelled luncheon, consisting mainly of eggs, stripped.

Over the South and North Dakotas and through the dreary prairie lands and low foot hills of Montana we rattled along, hauled by a ninety-ton engine of the Great Northern. Marvelous scenery comes to the relief of the tired eyes of the passengers, who, throughout the long day of Wednesday and part of Thursday, have seen nothing but a few scattered ranches and here and there a solitary cowboy corralling his cattle or a few Sioux and renegade Indians within the lines of their reservations.

Now, however, you are in the lands of game, and as the train alternately skirts the famous and ever-tumbling Kootenai river the deer and doe gaze in awe at the fast-speeding train, and many a man longs eagerly for his gun, for right yonder you can

"Seek nature's shrine that she may bless,
And lose your cares in the wilderness."

The morning breaks on the sixth day out to find you looking in wonder at the marvelous engineering feat of locomotive travel over the immense chain of the Cascade Mountains.

Seattle proved to be quite a bustling little city, and the streets were alive with prospectors, miners and tenderfeet in quest of supplies. Here we spent three days in getting our outfit together, aggregating about 1,200 pounds per man, and in the afternoon of the 16th the same was measured up and put aboard the steamship Farallon, bound for Skaguay.

The steamship companies contract to carry you and 150 pounds of baggage for \$40; for all in excess \$11 per ton is charged for baggage. Our treatment aboard during the voyage was good, our staterooms comfortable. The voyage is full of happy incidents and marvelous scenery, so much so that on the evening of the third day out from Seattle our first officer, thinking the passengers would delight in a closer observation

of nature's scenery ran us dead head on to Yolk Point, and as the keel pounded and grated on this uprising eye tooth of nature's long jaw there was some tall scrambling on the part of the men who could face any known danger without flinching. I caught sight of one man in his under flannels wearing a life belt around his neck and one around his legs. As for me—well, I climbed the smoke stack and hung my legs down the inside to prevent my feet getting wet.

We succeeded in getting off without much damage and on the seventh day, in spite of fogs and small delays, entered Juneau, 899 miles north of Seattle.

This little miners' town was founded about fifteen years ago and has now a population of about 4,500 white men and Indians. Like most mining towns, it is built up entirely of frame and log cabins, a few good stores for outfitting, an opera house and any number of gambling houses, but no bricks. From Juneau we steered ninety-six miles north to Skaguay, the entrance to the White Pass.

The World's correspondent and "Munchausen" Miller, as he is dubbed by the miners on the trail, had done their level best to boom this place, but let me tell you as the steamer could not approach the town within three-quarters of a mile, owing to the steep grade of the beach, your freight would be landed on the rocks, and convicts or slaves never worked harder than did



ON THE KLONDYKE.

those poor fellows as they trudged along with a hundred pounds of stuff upon their backs to get it safely to shore before the incoming tide came in and carried off part of their outfits.

Going ashore here, we reconnoitered the ground and soon found a frightful condition of "stick." Mud, mud, everywhere. Along the trail we plodded, hard work enough even without a pack on your back. Reaching Porcupine Hill, we found a condition of things seemingly appalling. Right before you the mountain slope was precipitous, and in order to avoid going over it an eight-inch log had been thrown over the roaring torrent, termed a stream, falling from the mountain side and finding its level in the valley below.

Across this log the men would drive and guide their horses and burros packed with from 150 to 225 pounds. Plodding and patiently the animals would cross the log until one more badly packed than another would strike his pack against the mountain side; then in an instant the poor animal would swerve aside, lose his footing and plunge into the seething mass of

water or mud below, there to lie with a broken back until his miseries were ended with a pistol shot.

In three days not less than twenty-seven horses and burros had shared the same fate, and we poor tenderfeet, perhaps chicken-hearted mortals, turned back over the trail to Skaguay, the town of six weeks' growth, boasting of a blacksmith, a dancing hall, half a dozen dissolute women, a dozen saloons and gambling holes, a floating population of over 2,000 and twenty-three acres of ten-inch mud.

—To Dyea.—

Contrary to our expectation, as we had taken passage to Dyea, we found the steamer unable to land us within four miles of the place, and many threats, made up of foul adjectives and improper nouns, were made and directed to far-distant heads of the shipping companies.

A scow or lighter was procured by the captain and all night



Our Correspondent's Camp at the Ferry, half-way between Dyea and Finnegan's Point, 14 miles south of Chilkoot Pass August 31st, 1897.

long the rattle of the chains told of our stores and outfits being hauled out of the "hold" and dumped on the lighter, and at 6 the next morning, perched up on our provisions, we were cast off from the ship only to lie alongside of another, the steamship Elder, to take on more freight and passengers, in all nearly 500 tons, on a rickety old barge that threatened to go to pieces. At 7:30 that evening, having been without food or water the entire day, we again cast off and were taken in tow by the tug Pioneer and conveyed round the point to Dyea. The tide was up. We were told we could not land until the tide receded the next morning; so standing guard over our outfit and provisions we made every effort to keep out the piercing wind until just before daybreak, when the master of the scow told us we might begin to unload our stuff on the beach. "And boys you've got to rustle because the tide will be up again in four or five hours." The Pilgrim Fathers never felt more desolate or hungry than did we. A weird scene, indeed! Two hundred men unloading and carrying away far up the inlet packs of 75 and 100 pounds in the dreary mists of a half-developed dawn. No welcome, no encouragement. Plodding over the sands, you seek a good spot in which to pitch your tent.

Slow work, indeed, when I tell you that your 1,200 pounds personal outfit had to be carried over by your horse and yourself and the distance covered was two miles there and back, would necessitate five trips of 250 pounds a trip before you were able to cook your coffee and bacon, about 3 o'clock the same afternoon.

Resting the next day, we were compelled to dry our bacon in the wind and sun and pack everything in sacks of fifty pounds.

The trail from here past Healy & Wilson's trading post and postoffice (where they were always out of stamps) is fairly good, and with our five burros we next packed our stuff to Finnegan's Point, a distance of six miles.

This necessitated seven trips of twelve miles daily and was acclaimed by all as sufficient.

It was here that we made our disastrous move. My partner, F. H. Griffith, also of Philadelphia, and I resolved to start over the trail, cross the summit of Chilkoot Pass and get into Lake Linderman, our motive being to get the lay of the ground first and, secondly, to get initiated in the method of Yukon boat building. Attired in hip boots, sweaters, slickers and

sou'westers and sixty-five pounds packed to our backs, consisting of tools, provisions and blankets, we started off, leaving instructions with our party to push forward with the rest of the outfit as soon as possible and join us at Linderman. From daybreak until 4 in the afternoon we plodded on, while the rain and wind soaked us through, sometimes plunging through the streams up to our waists, now knee deep in mud, slipping, sliding and swearing as we toiled up the steep trail, through Sheep Camp and on to "Stone House," where the timber line ceases, past the scales and now up the forty-five-degree incline of the Chilkoot. We reached the summit at 2 p. m. on the third day out, and in the afternoon of the fifth day's marching struck Lake, or Camp, Linderman. Footsore, weary and hungry though we were, we could not refrain from exclaiming in sheer admiration, "Beautiful."

Down on the beach skirting the lake were to be seen 500 or 600 tents, white as snow, their guy and ridge lines stretched to the evergreen and graceful balsam trees, shut out from all civilization by the immense chain of snow-capped mountains that reverberated the sonorous thud of the ax, the tap of the hammer and even the rip-rap of the caulking iron and mallet, and reflected the huge bodies in the rippling and wind-tossed waters of the sea-green lake.

Nowhere in the States could you find so busy a boatyard. Men were cutting and felling logs, whip sawing, rip sawing, making stems, knees and ribs, caulking, pitching and planing.

It was just a great big heap of bustling workers, where masters paid well for labor and honest labor was given for food and generous wage.

—The Method of Working.—

Usually a party going over the trail consisted of four men and two tons of provisions and necessary outfit. As Linderman is at the head of the waters that carry you to Stewart river and Dawson City, it is right here, after having your entire outfit brought over, that you divide your men, two to go over the hills about two miles to cut the logs, erecting their own saw pit. They whip-saw the logs into six and eight-inch boards and carry them over into the camp, where the entire party, exempting the cook, rip-saws the edges. Then it is that the strong man, but green, finds it impossible to shape the



SKAGUAY—Entrance to the White Pass. Tents on beach 500 yards distant from vessel. Taken from deck of Steamship Farralow, August 24th, 1897.

lines of his boat without some outside practical assistance. Our tent pitched, my partner and I were not long in responding to an invitation to work, even though it were for only \$15 a day and three meals. Two days after and we started in on a new boat at \$20 a day and three good meals, working from 7 a. m. to 6 p. m., with forty-five minutes for noon dinner, payments being made each night after supper.

There were no contractors or bosses. Every man was a partner. There was but one divisional line, and that was that the man who had to hire help and had the money was compelled to pay well for labor. Nevertheless he ranked simply as a partner and worked well with the rest of us. It was a small illustration of a grand democratic commonwealth, as I understand it.

We continued to work and to thrive, when news reached us fourteen days later of the terrible avalanche at Sheep Camp and the partial loss of our outfit. The letters would be borne by the Siwash Indians packing over the trail at the modest

charge of \$2. A brief consultation and we agreed it was useless to go farther north, and as we had but one day's provision left in our tent it was necessary to sell out the heaviest part of the kit and make our way back to our companions.

Herewith I give the list of goods sold:

—Purchased in Seattle.—

	Bought for.	Sold for.
Pitch, per pound	\$.08	\$3.00
Oakum, per pound	.25	1.50
Whip saw, 6 feet 6 inches.....	6.50	18.00
Blankets	10.00	20.00
Nails, 6, 8 and 10-penny, per pound.....	.10	2.00
Baking powder, per pound.....	.40	2.00
Sleeping sacks	7.50	15.00
Stockings	.65	2.50

In addition to this I saw 100 pounds of sugar sold for \$120.

After a light flurry of snow lasting about three days, we sorrowfully turned out faces to the east, and with light blanket packs weighing about thirty-five pounds, made our way over the mountains to Deep Lake. From here on all sign of a trail was lost. The snow flurry had suddenly become a blizzard and the four men now forming our party, two others having joined us, we plunged on and up the chain of mountains forming the northern side of Long Lake. Plunging in waist deep into the drifts, we struggled on, helping one another by our life lines as best we could. The snow, crystallizing as it fell, blinded us and cut our cheeks and made it impossible for the last man to discern the leader. Snow glasses were useless and our mountain sticks became so encrusted with ice that it was impossible to obtain a firm grip through our heavy moose-hide mittens. Time and again we fell until, wearied, it seemed almost useless to rise again.

Fate seemed against us and I was not alone in believing we had made our last journey. We debated as to whether it would not be better to dig a hole in the snow and wait for the blizzard to spend itself out. Blindly, sleepily, we pushed on, realizing it was our last hope and effort. And in answer to our cries, from afar off across the narrow bed of the lake, came a welcome answering call that snatched us from the jaws of death. Even in our half-frozen condition, we did not hesitate. Sitting down we slid down the mountain side as boys, and reaching the shore of the lake plunged into the icy waters, thigh deep, and scrambled in the snow on the other side, where stood our rescuers, Messrs. Gates, Collins, Pellscher and Jacobs, four sturdy sons of sunny California, temporarily encamped there, who took us in, clothed, fed and sheltered us for two days and three nights. Boys, it's a cold country. Two days later I stood outside the same tent and looked around. Shut out from the whole world, I could see nothing but mountains, valleys and foothills, covered with snow from five to thirty feet. Even the tall balsam trees on the mountain sides showed only twelve inches of their tops.

Such inroads were made into the provisions of our rescuers that, finding that they had but two more meals left, we all resolved to strike tent and take to the trail again. Our second attempt was more successful and the entire eight of us reached Sheep Camp and our former companions late that night, after a hard scramble,

As down we go

Through many a craig and hollow,
With shortened breath and ears alert
For those that are to follow.

Reaching the coast at Dyea, we boarded a skiff and after an hour's sail embarked aboard the steamship City of Topeka. Splendid specimens of Eastern dudes, clad in seal-skin boots, moccasins, fur cap, mittens and mackinaw, hungry for news and fresh meat, not having received a line from any living soul in the States from the 15th of August until the 26th of October, nor eaten fresh meat for seventy-eight days.

Six days on board the steamer and a week in Seattle was necessary to get our feet in New York condition again, our appetites being the only thing that did not need renovating. It could not be improved upon.

He who sets out to find fortune in the Klondike needs most a sturdy constitution and strong will power. Clayworkers as a rule are strong and brave. Both faculties are needed and will be tested severely in a trip to the new gold fields of the far Northwest.

W. P. LOCKINGTON.

FROM THE ASHES.

It is confidently expected that within the next few weeks work will be commenced on the rebuilding of the Kirkham Art Tile and Pottery Company, whose large plant was totally destroyed by fire several years ago at Barberton. The enterprise has been revived by Akron capital, and O. C. Barber and George W. Crouse are at the head of the move to rebuild. The new buildings will be on the same site as were the old ones;

in fact, the best of the walls left standing from the fire will be utilized in constructing the new buildings, which will cover the same amount of space. The new company will contain but one or two of those who were interested in the old one. The plant will be in operation by May 1st. About two hundred hands found employment in the old shop, and many of them, being skilled workmen, received large salaries. It is expected that fully as many will be employed by the new company, and if the business warrants, many more will find employment.

The deal between the Trent Tile Works, of Trenton, N. J., and the old Kirkham Company to consolidate the two, last spring, was almost perfected, but later on fell through. The present move is entirely independent of that, and Akron and Barberton people are delighted with the thought of seeing this formerly lively industry again revived.

A \$1,900 HORSE IN THE CLAY BUSINESS.

The Akron Brick and Tile Company, whose busy plant is located in East Akron, can perhaps boast of the most valuable horse used in the clay industry in the United States. The horse was imported from France fourteen years ago at a cost of \$1,900. He weighs 1,500 pounds, and is at present used to haul the cars of clay up the tram railway from the clay pit to the shop, a distance of about fifty rods. He cost his present owners \$75.

THE DECATUR CONVENTION.

Program of the Twentieth Yearly Meeting of the Illinois Clayworkers' Association.

THE COMING CONVENTION of brick and tile men to be held at Decatur, Wednesday and Thursday, January 5 and 6, 1898, bids fair to be one of the most successful in the history of that body. Mr. G. C. Stoll, the energetic Secretary, sends the following list of papers already provided for, and states that other interesting numbers will be added and the complete program announced in our next issue:

—Wednesday, January 5th, 10:30 a. m.—

Enrollment of members. Reports of members. Report of Secretary. Adjournment.

—Afternoon Session.—

Address of welcome, by Hon. Benjamin Taylor, Mayor of Decatur.

Annual address by the President, W. S. Purington, Galesburg.

A paper—"Burned Clay for Road Purposes," by F. Plumb, Streator. Discussion.

Address—"Tile Drainage as an Investment," J. J. W. Billingsley, Indianapolis, Ind. Discussion.

Essay—"New and Old Brickmaking," William Ammann, Decatur, Ill. Discussion.

Address—"The Dividends," W. D. Gates, Chicago, Ill. Discussion.

A paper by E. W. Bach, Ottawa, Ill.—"How Can We Best Dull the Raw Edge of Competition?"

Appointing Committee on Resolutions. Adjournment.

—Wednesday, 6:30 p. m.—

Annual banquet, given by the Decatur brick manufacturers.

—Thursday Forenoon, January 6th,—

Will be devoted to visiting various brick industries and places of interest, the Convention being in charge of the Committee of Arrangements: Albert Ammann, Sherry Tuttle and Davis Brown.

—Thursday Afternoon, January 6th.—

A paper by E. M. Pike, Chenoa, Ill.—"Benefits of Tile Drainage."

Essay—"The Advantages of Large Tile Drains—How to Lay Them," S. C. Cowgill, Summitville, Ind. Discussion.

Address—"Hollow Blocks, Their Advantages," Wm. Griffin, Griffin, Ill.

Essay—"The Value of Conventions," J. H. Lambert, St. Marys.

Address—"The Tribulations of a Brickmaker," Dr. A. L. Converse, Springfield.

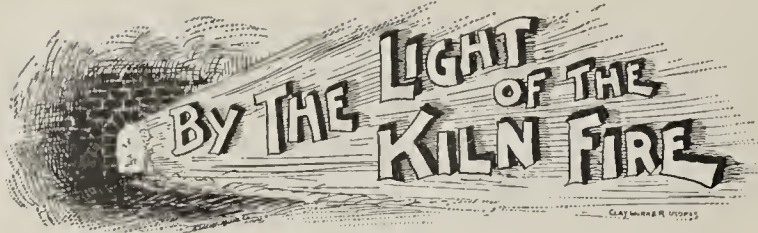
A poem—"The Tilemaker's Dream," D. O. Loy, Atkinson.

Report of Treasurer. Report of Committee on Resolutions. Election of officers.

Headquarters will be at the St. Nicholas Hotel.

W. S. PURINGTON, President, Galesburg, Ill.

G. C. STOLL, Secretary, Grant Park, Ill.



A BRICKYARD GHOST.

ONE SELDOM HEARS of a haunted brickyard. Perhaps the spirits find the surroundings too suggestive of hard work and discomfort. However it may be, when one considers the number of haunted mills, haunted quarries, haunted mines, and even haunted logging camps, he is struck with the singularity of the fact that there are no haunted brickyards. The woodsmen of the North have their haunts, and among them it is the firm belief that any camp which has been occupied by blasphemous men during the winter becomes the summer abode of Beelzebub himself when the crew gets ready to move out. The haunts of the mill men are too numerous to mention; the cotton mills, the woolen mills and the paper and pulp mills all have their haunted rooms and haunted machinery. The haunted tanneries of the Northeast woods are many. In one the haunt takes the place of a shaft that cannot be kept whole. This particular haunt began fifteen years ago, when a shaft broke during the night and the bent end, whirling, caught the vat-tender and hurled him to death. New shafts have been put in each year, but as surely as the anniversary of that first accident comes around the shaft breaks. Two men have been killed and two severely injured by this queer performance within a few years. There is no doubt in the minds of the tanners upon the subject—the tannery is haunted.

But I was saying that, while every other form of industry has its haunts, the brick industry seems to be remarkably free from superstition. This seems to be the more remarkable since in many localities the brickyard hands are drawn from the ranks of the dwellers in haunted camps and workers in haunted mills. There is something too rudely practical about the brickyard to give chances of superstitious thoughts.

Yet I knew of one brickmaker who insisted that the brickyard wherein he was employed was haunted. He used to sit up by the kiln fire and tell the youthful audience of the weird doings of the jack-o'-lanterns in the woods back of the brickyard. He had seen moving lights rushing hither and yon through the woods, and had heard strange cries as of evil spirits holding carnival over the corpse of a victim. He had indeed heard and seen these things, but Cale Flannigan and Bob Rogers, two daredevil youngsters of the village, could explain the sights and sounds if they wished. The explanation would also clear up the mysterious weariness and lack of fatness of the poor old grinders that were turned loose into the woods to pasture at night and rest. It would also explain the mysterious disappearance of several lanterns in town; but John Ackley would still hang to the belief in the haunt.

Johnny Ackley had other reasons—good and sufficient they seemed to him, too—for considering the yard haunted. It was about a month since he first noticed the lights in the woods, and he felt creepy feelings in the region of his spinal column

whenever he was compelled to venture upon the yard after dark. It is strange how, after he first became convinced of the haunts, evidence multiplied to confirm his fears. I can account reasonably for every manifestation but one. We were sitting on the wood-pile, facing the arches, one night. Over our heads was the low shed roof, and fronting us was the kiln, not more than ten feet from us. Johnny was telling in an awed tone of how the lights were dancing in the woods, when I heard a heavy thud, which was followed by a cry of agony from Johnny, and he fell over the wood-pile, with blood running from his swollen lips. Something (we never found out what it was) hit him with great force, and it must have come from the kiln. Unless it was caused by the explosion of a brick (which I think likely), there could be nothing but the work of spirits in it. Johnny hung by the kiln, notwithstanding the strange occurrence, but when the burn was complete he announced that he would work no more by night on that yard.

The haunt still pursued him, though. One night, after a week of most glorious weather, and a sunset that gave promise of another pleasant week, the crew was awakened by peals of thunder and flashes of lightning, while torrents of rain fell with a roaring sound upon the roof. Quick to weather up, Johnny was in his clothes and away to the yard. The rest of the crew followed. The brick were weathered and the light of dawn began to creep up in the east, when one of the men



A Brick Paved Street—Decatur's Street Car Transfer House, St. Nicholas Hotel in the back Ground.

heard a moan and a swash, as of something falling in the big drain that ran by the sides of the yard. Some of them rushed to the place and lifted up a long length of heavy spouting, and there lay poor Johnny Ackley, half dead from the effects of the fall into the drain, with the weight of the spout he had been carrying pressed down upon him.

He had been in the drain an hour or more. When he revived he said that as he ran into the yard from the road leading from the boarding house he thought of the spooks and wished that he hadn't been in such a hurry and got so far ahead of the crew. Just then, he said, there was a vivid flash of lightning, and he saw running before him a brickmaker who had worked with him the year before, but who had been killed the winter before by a falling tree. Johnny forgot that he was dead, and, glad of his company, redoubled his speed to overtake him, and as he did so rushed into the brook, which was over his head. He fished himself out, however, and, grabbing a spout, ran to place it upon a hack. As he endeavored to run there came another flash of lightning, and he saw

the man dancing on a hack. He must have tripped, but he couldn't say what happened after that. Had the men not heard him groan he would probably have died in the drain. Everybody laughed at Johnny's vision, and when Cale Flannigan was caught playing John Gilpin with one of the old brickyard horses and a lantern, one night, Johnny's haunt was lifted from the yard. But Johnny wouldn't believe that the haunt was off, and he left the yard and brickmaking entirely. Since then he has amassed a fortune in the vicinity of a Minneapolis grain elevator, where there are no haunts.

That's the nearest approach to a haunted brickyard that I have any knowledge of. If Johnny reads this, I would like to have his opinion on the subject now, after many years.

THADDEUS.

DECATUR THE "CENTRAL CITY" OF THE CENTRAL STATE.

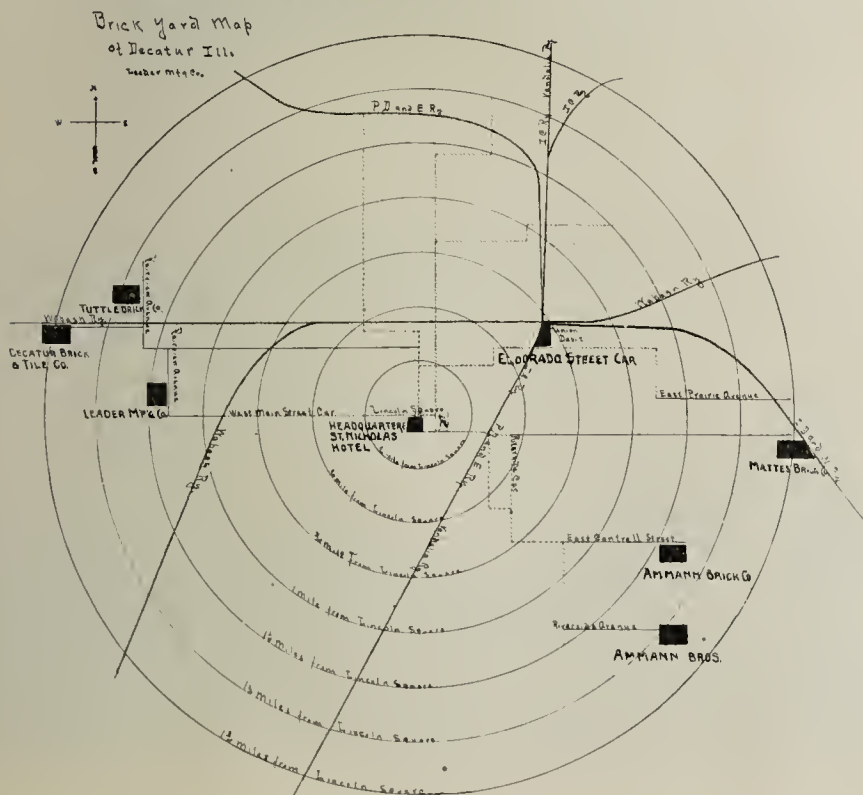
The Center of Attraction for Clayworkers of Illinois
Wednesday and Thursday, Jan. 5th and 6th, 1898.



LOCATED within eight miles of the exact geographical center of the State, Decatur is fittingly called the Central City of the Central State of the Union. It is also in the center of the richest coal fields of Illinois, in the center of the great corn belt and is surrounded by one of the greatest food-producing sections of the globe. As a natural result it is a great railroad center. Thirteen lines of railways lead out of Decatur to all parts of the State and those adjoining. Considering these points in its favor, it is little wonder that the executive committee of the Illinois Clayworkers' Associations selected Decatur as their next place of meeting. And we predict the attendance will be larger than any State convention for a number of years.

There is much of historic interest connected with Decatur. It was the scene of some of the martyred Lincoln's early legal triumphs. Here, before the days of railroads and telegraph, when not engaged in splitting rails for John Hancks a few miles distant, he came to attend court, which was held in a little log house, of which we show a picture. This very log house now stands in a public park just as it stood in 1830, an impressive reminder of pioneer days.

Decatur is now a city of 30,000 people, owning its own water works and electric light plant, a good fire department,



a good system of trolley cars and well-paved streets—brick paved streets, be it said. The brick for her streets are all furnished by her own home manufacturers, and while they are not the best paving brick in the world, they are good, hard, durable brick. They stand the wear and tear of traffic better than any other available material would, and the powers-that-be are wise enough to appreciate this and by using Decatur pavers give employment to hundreds of her own laborers.

It was our pleasure recently to meet B. Z. Taylor, the



Decatur's First County Court House.

Mayor of Decatur, and chat with him about matters of local interest. He is an advocate of brick pavements, but wants them to be first class, and so is prodding the local manufacturers with the laudable purpose of stimulating and encouraging them to improve their product to the standard of the best. This has had an effect, and as a result nearly all of them have lately put in represses and now turn out a smoother and better appearing brick than ever before.

—Decatur Brick and Tile Plants.—

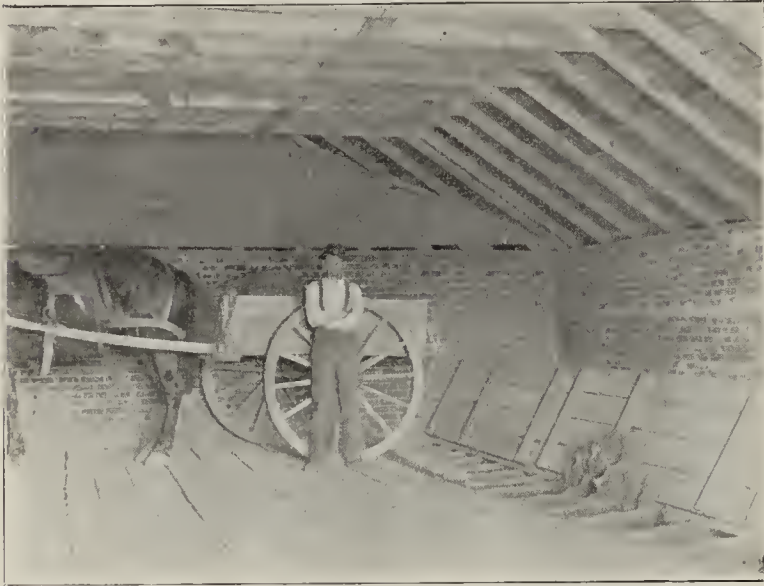
Decatur has five brick and tile factories, each of which make both building and paving brick by the stiff-clay process. The accompanying chart shows how the plants are grouped—two in the east and three in the west end of town. In company with Davis Brown, we visited them all and found them, naturally, somewhat similar in equipment. The plant of the Mattes Brick Company is, we believe, the youngest of the lot and consequently the most modern in general arrangement. It was built in '95. Prior to that time the senior Mattes had operated a similar plant and in his early years made brick by hand. The plant is well arranged, tidiness and good order prevailing in every department. They are making 40,000 brick a day; about 40 per cent. are pavers, the balance building brick. They expect the coming season to devote more attention to repressed front brick. Their machinery consists of a Leader crusher, Freese No. 3 combined pug mill and brick machine, from which the clay comes in a double stream and is cut in proper lengths by a Leader end cut table and carried along on an endless belt to the represses. They have two of the Leader Manufacturing Company's latest power presses, each speeded to 20,000 a day (eight hours).

The entire equipment, from crusher to repress, works smooth as oil. From the repress the brick are trucked to a steam-heated dry room, which is about 60x100 feet and holds when filled 250,000 brick, or about a week's run. From this dryer the brick go to down-draft kilns. They have three round Eudaly kilns of 50,000 capacity each and one square Eudaly holding 165,000. The building brick are burned in common up-draft Wingard kilns, two of which have a capacity of 360,000 each. In the latter kilns the brick are water smoked with wood and finished with coal; the down-draft kilns are water

smoked with coke in about three days and finished with coal in four days more, or seven days from start to finish.

—A Two-Story Clay Pit.—

They have twenty-five acres of good clay averaging four feet in depth. It is all worked clean from top to bottom without stripping. It is hauled in ordinary dump carts to the second story of the clay house or pit and dumped through openings in the floor, as shown by our illustration. This clay house, or pit, as they call it, is the most distinctive feature of the



An Easy way of Handling Clay—Mattes Brick Co.

plant. It was designed by E. D. Mattes, who considers it a very economical and satisfactory arrangement. The building is a two-story structure, 24x40 feet, and joins the machine house as an L. A belt conveyor extends across the center of the ground floor, through an opening in the wall of the machine house to and above the crusher. A row of 6x6-inch uprights eight feet apart are placed on each side of the elevator, extending from floor to ceiling. As clay accumulates boards (2x8-inch) are placed against the uprights, thus forming a clay bin on each side of the elevator the full length of the house. One side of this pit is filled at a time, the floor above being built in sections, so as to lift up or close down as desired. When one side is being filled the doors on the opposite side are closed down to allow the horse and cart to pass over.

As the pit is emptied the boards are taken down one at a time, keeping the clay on a level with the top board, thus enabling the shovelers to scoop or shovel the clay down on the elevator. One man can handle more clay that way than four can where it must be lifted up a shovel full at a time. Some may wonder whether the conveyor doesn't get out of order and

cause trouble. Mr. Mattes says he has no trouble of that sort. He has a geared Leader elevator fitted up with a 6-ply, 16-inch Leviathan belt, than which there is nothing better, so arranged and boxed in that the clay doesn't leak through at all. It is this latter feature which makes trouble generally. The pit when filled holds clay for 90,000 brick, thus providing for a couple of days' run in case of bad weather.

A few blocks from the above plant are the two Ammann yards, one operated by the Ammann Brick Company and the other by the Ammann Bros. The former is the parent plant and is operated by Conrad, William and John Ammann. They have an Adrian three-stream augur machine, Leader pug mill and cutting table and will probably add a Leader power repress before convention time. The brick are trucked to a slatted floored, steam-heated building, where they are placed on boards eight feet long and pushed back in racks which line the runways, extending the full length of the building, a one-story structure, 30x100 feet. The pavers are burned in round down-draft kilns and the builders in Wingard kilns.

The Ammann brothers, Henry A. and William G., have a



Getting in the Coal—Mattes Brick Co.

similar plant near by, which is equipped with a Freese brick machine, Adrian crusher, Leader automatic cutter and the same system of drying and burning as at the other yard, making 30,000 per day, part pavers and part building brick. They all make the common or standard size brick, so they can be used for either purpose, according to the burn.

The west end yards are located a few blocks apart on opposite sides of the Wabash Railway. The Decatur Brick and Tile Company have a combination building and paving-brick



Works of the Mattes Brick Co.—Clay House to left.



Works of the Tuttle Brick Co., Decatur, Ill.

factory, which was built under the direction of our old-time friend, John G. Shea, one of the pioneers in the paving-brick line, who is president of this company. He is no longer a resident of Decatur, having moved to Danville, where he has an extensive paving-brick plant. O. C. Stafford is secretary and superintendent of the Decatur Brick and Tile Company. The works are equipped throughout with machinery from the works of the Leader Manufacturing Company, consisting of crusher, brick and tile machine and automatic cutter. They



A Relie in Tuttle Brick Co's Clay Bank.

dry with steam and burn in round down-draft kilns, known as
—The Decatur Kiln.—

Its distinctive feature is a solid floor, except a ring or circular opening, to which the flues are connected by tunnels underneath the floor. They are usually built 22 feet in diameter, 7½ feet high from base to crown, with 4½ to 5-foot raise. Each has ten fire boxes 20 inches wide, 36 inches high, with an opening into the bag wall 28 inches high. The walls are usually 24 inches thick and the fire boxes are 24 inches long and half as many chimneys as there are fire boxes. The dimensions are 8x10 inches and 14 feet above ground. The bag walls are 8x20 inches, 5½ feet high. The ring in the floor is 8 feet in diameter and usually 12 inches wide by 30 inches deep. In other essentials it does not differ materially from the ordinary round down-draft kiln. The Decatur manufacturers consider it comparatively inexpensive to build and maintain. There being but one opening in the floor, and that easily accessible, it is but little trouble to keep it clean and in good working order. It produces a large percentage of good pavers.

The neighboring plant, that of the Tuttle Brick Company, is similarly equipped throughout, except that a large per cent. of their product is drain tile. They also have a large number of large Wingard kilns, in which they burn their builders. Their paving brick are all repressed and burned in Decatur kilns. Mr. B. B. Tuttle is president of the company, S. A. Tuttle secretary and treasurer and John Diller is superintendent. Their plant, like that of their neighbors, is conveniently arranged and well managed.

Not far from this plant are the shops of the Leader Manufacturing Company, whose superintendent, Davis Brown, is one of the best-known clay-working machinery salesmen in the country. "Davis" is not very large physically, but he is very broad-gauged. His genial, pleasant ways have made him many friends, a host of whom he hopes to welcome to the "Central City" January 6th. He and the Decatur manufacturers will make it their business to see that every visitor is made to feel at home. In this they will be heartily seconded by Mayor Taylor, who assured the writer that it would afford



A Double Row of Kilns on the Yard of Tuttle Brick Co.

him pleasure to tender the freedom of the city to every clay-worker in the State and as well to those who may come from adjoining States.

As stated in another column, headquarters during convention week will be at the St. Nicholas, a first-class hotel, which has been in charge of the present proprietor for many years.

Sec, saw, Margery Daw,
Business shall have a new master;
One who has eyes and will quick advertise,
And bring in the dollars much faster.

—Exchange.

POTTER'S GRIT.*



WANDERING DOWN on the shore of the great Gulf, where its white surf breaks on the whiter sands that bar its passage northward into Mobile Bay, I picked up from the sand and shells broken bits of pottery, worthless, disregarded, ground under foot. Yet these fragments, small as they are, are to-day all that tell the history of a people that have been wiped out—that have passed into oblivion. Looking attentively at them, we find they are composed of clay, mixed with a grit formed from pounded oyster shells, and that the firing has been at so low a degree of heat that the shells have not been changed into quick lime. We learn that this lost race, working away from and apart from the rest of mankind, were yet like mankind in general in some of those few things that are common world-wide. They sought to control the shrinkage of their clay. They used grit. We find, moreover, that, using grit, they were enabled to fashion their ware into good forms—shapes that conform to those curves or lines of beauty that are accepted as standards among all people and in all climes. We find that these fragments of clay and grit show uniform thickness—not that they are all the same thickness, one dish with another, but that, while one dish or vase might have been made thick and an-

and grit, so cunningly fashioned by the hand that had perished, had withstood the touch of time and remained to tell a brief but interesting history.

These are little things, but the little things are, after all, the things that influence life, and that remain in effect often when the larger things lose their effect and are lost. The barefooted boy who has left the tracks of his bare feet on the old farm and has carried the freshness of his young life into the hot, dusty, angry strife of the city has, in its constant grinding and worrying bustle, exchanged that freshness for a collection of dollars in the bank (if he shall be deemed successful) and possibly a collection in his inner conscience which may be far from pleasant; still, as he is luxuriating in the recollection of those dollars and the power they give him, and striving, possibly, to grow a hard and protective callous over the galled spots on his conscience and wipe out and obliterate the ignoble but honest past and live in the artificial present—still the sight of a hollyhock, such as used to grow in the old farm-yard, is a wizard, a little fairy, that instantly changes him back into an honest, dutiful, obedient and happy farm boy. What a recollection it brings him of the patient, loving mother who planted it and cherished it!—that mother who loved him so well that she gave, unstintingly and without complaint, patient, persisting and unremitting toil, without expectation or hope even of appreciative acknowledgment for the awkward, bony, long-legged, sharp-elbowed boy that was hollow all the way down



The Decatur (Ill.) Brick & Tile Co's Works. See page 449.

other thin, according to their several necessities, still whatever thickness the article had in one place it had in another, being uniform all through. This, too, was attained without any use of the potter's wheel, on which we are so dependent, the article being built up by hand by patting inside and out and rubbing with smooth rubbing-stones as tools. One of their actual tools I found, just as the busy hand of its owner left it, generations before the sails of Columbus sought the waters of the New World.

We learn from these fragments of clay and grit that this vanished race had aspirations toward the artistic. That they had eyes that saw the beautiful. That they sought to further beautify their ware by tracings of curved lines upon it, by working the surface into a roughened, stippled or checkered form, such as would give a pleasant effect to the eye. We learn, further, that the artist of that day, as in this, turned his clever fingers to plastic clay cunningly mixed with grit to fashion the shapes which he wished to show and preserve, real and fantastic, to coming generations. There I found them ages afterward. He had gone the way of all that was mortal. His song was sung, his fires had gone out, his body gone to ashes, and he forgotten, and his race in oblivion; but the clay

inside and all angles and knobs outside. All her loving kindness, all the thousand little memories of that past, come back through the chance look at the hollyhock. To this worn-out and city-weary man of the world a bob-o-link twittering and fluttering down in his ecstatic spasm of jolly, laughing song is a fairy that cuts out and folds away from sight all the hard years of mean grasping and grinding, and in just one single second makes him again an honest, freckled, barefooted boy with a pug nose, bruised heel, ravenous appetite, but with a conscience as clear as a summer sky.

But the little things are the hard things. In the far East, when that great captain made that long journey with a great caravan loaded with treasure, moving along with stately pomp under that great leader, who had honor and wealth and station, everything that he could wish, and yet that one thing that made all the other things pall and sicken—the curse of leprosy; a leader great in national affairs, and yet who was now following the advice of a little serving maid, (just as we, now and always, reach out so eagerly for any possible hope of relief from our physical ills,) so this great leader rode in stately magnificence, but a leper, to the prophet in the far country. Cheerfully would he have given treasure that would be ransom for a kingdom; willingly would he have undertaken long and laborious pilgrimages; ready, indeed, was he for dramatic

*Delivered before the Ceramic Association, Ohio State University, Columbus, Ohio, November 9, 1897.

action, for high-sounding speech, for gorgeous display. But when the long, tiresome journey was ended at last at a commonplace abode, and a quiet, unostentatious man, living with quiet, meagre surroundings, simply told him to go to an adjoining murky stream and wash and be cured, he was affronted and started back. It was too little a thing—too simple. He expected the prophet to sweep out in gorgeous apparel and, with stately tread advancing, strike his hand on the afflicted man, and with mystical waving of hands to call out to his God to heal. Nothing of this was done. The quiet, hungry-looking man barely noted his presence enough to give that one command; and so the stately caravan started back, disappointed and disgusted because the thing commanded was absolutely too small, too little and insignificant, absolutely too trifling to heed. But here again a little thing. The great captain was in high dudgeon; so were his chief men. His lieutenants, his wise men, all were indignant at their reception, and concurred in the backward movement—were all indignant that their ideas had not been complied with—were exasperated at the long journey with such a farce for an ending. All but one, and that one of the humblest. Not a leader or one in any way great, but just a humble, lowly, modest servant, and yet carrying a head filled with that ingredient which all the rest seemed to lack so sorely—common sense. This lowly servant, timidly approaching, suggested that if the thing bidden had been great, difficult and generally hard to execute, that then it would have been done without question, adding, "Then why

Little thing as it is, it is essential. It gives form and shape. While not originating beauty, and while not beautiful in itself, it holds its covering in shape so that it is beautiful. And so great has been the need for it that, as has been before stated, it has been schemed out all over the wide world. Not told one to another, but dug out by each in turn, working alone, and wrought out simply from necessity. Their locations were widely different, their stations in life diverse, their civilization widely divergent, but their minds were the same, and this brought them all to the use of grit.

The best grit is not the smoothest grit; the little, jagged, rough-pointed particles that strike their sharp points together and brace and hold back, letting the plastic clay creep around them and shut them in, are the best for grit. The smooth, round particles may be nicer to look at and pleasanter to the touch, but the other is the kind selected for service. Then, too, it must be of the right kind to stand the use desired, and judgment must be exercised in its selection.

Again, the proportions must be ascertained, as the use of too little grit or too much grit would spoil the ware in many cases, and in many cases the way even in which it is mixed must be well taken into account. Considering all this, it may be well to notice that the potter has use for parts of his anatomy other than his hands and feet, and that however much he may use these members, he must all the time use his head. He must even use his head in mixing in his grit. His hands alone will not do. This the general public can hardly under-



Factory and Machine Shops of the Leader Manufacturing Co., Decatur, Ill. See page 449.

not try the simple thing bidden anyway, after all the trials of the long journey?" And so the great caravan turned on the common-sense advice of a servant, and the disgruntled crowd of grumbling dignitaries wended their way down into the valley for the very lowly ceremony that was to bear such a wonderful fruitage of results.

Yet, while we criticise this captain, we are all like him; all the time we say to ourselves, as we put off and away the little annoying details, duties and burdens of our everyday life, "Oh, if the Master had only bidden me to do some great thing!" Yet the man who does the little, hateful, obnoxious duty that comes to him, and does it well, is the man that grows and comes to high position, while the man who lingers and loiters, waiting for something that is great, ever waits, and always will wait, for come to him they never will; while he who fills each day with its quota of duties done, while day follows day, and each works out its way until a life made up of weeks and years of such days is the pinnacle of a life's record.

So grit is a little thing with the potter, and the little things, as I have said, are not to be passed too quickly by or slighted in passing. The potter's ware must be upheld through the trying portions of its career, and it is the grit that does this. During the periods of shrinking, drying and burning, the grit is a skeleton whose bones hold it, strengthen it, and shape it, as the bones in your body and in mine hold and keep the flesh in shape, instead of leaving it a shapeless mass upon the floor.

stand. They look upon the successful clayworker as a man who has been lucky—a man who has gone out and stubbed his toe on something, and that when he looked to see what he had stumbled on, he noticed a peculiar substance, already prepared by the Almighty, ready for his use. This he only had to shovel out and turn into money. They are slow to realize that, while God gives the men the ingredients, He always insists on man's making the mixture. Man must mix the clay and the grit and the brains in the proper proportions, but no one of these ingredients would do alone, nor would an improperly proportioned mixture achieve a successful result.

But the potter does not put all his grit in the ware, nor is his ware the only thing he does put grit in. He mixes large quantities of it in his business—has to use it there, and has to use lots of it, too. I use the term "potter," designating all clayworkers, and I use the term "grit" for just what it certainly means in this connection, for certainly nothing else would accomplish the desired result. Really, for a man to be a successful clayworker, he must of necessity be so constituted that he will not know when he is beaten. Many a general has won a battle with shattered ranks and broken columns simply because the leader did not know when he was whipped, kept on fighting, and, as a result, neither he nor anyone else ever did find it out, and he won.

Years ago I heard one of our veterans in the National Convention say that if he had ever been able to know when he

was whipped he would have gone out of the business long years ago; but he did not, and he was a brilliant success at last.

Many kinds of business have troubles; indeed, there is no line that is without it, with the possible exception of the members of this organization. Among clayworkers it is generally conceded that their line has more tribulation to the cubic second than any other known line. Trouble grows with clay. You can't seem to mine clay without bringing out about so much trouble with every load. Sometimes it does not run even—that is, the distribution will not be equal. A good many loads may come out without your sighting any trouble at all, but you need not be deceived; it will come; it is only bunched, and presently a whole hatful of it will come, and come strong and fast when it does start.

This necessitates the mixing of this large quantity of grit in the everyday business, and it happens very fortunately, as nature often provides, that the clayworkers seem to have more grit for such purposes than any other class of people; and they not only have the grit, but they use it in the business. When additional loads of trouble are coming in the one door, and additional loads of bats are going out the other, then the grit counts. Very likely, the trouble may come like the grit—in sharp, jagged bunches, with sharp cutting corners and angles of all shapes, for the clayworker has abundant opportunity for variety in trouble. He has to deal not only with material that goes, as I have said, in close communion with trouble, but he has the whole wide range of the labor problem, coupled with the intricacies of the currency and financial field, and these, as a rule, are interspersed among his frantic efforts to get bread and butter for a large and growing family of future clayworkers.

Hence the use of grit in his business—the use of hard grit, jagged, sharp-pointed grit, in large amounts and at all times. This is what pulls him through in the end and makes him a man among men, triumphant over great obstacles, honest, reliant, looking you straight in the face always—a man tried and found true, accustomed to meeting obstacles and capable of surmounting them—a man who uses grit—a “gritty” man.

Far to the westward, on over the great rivers, past the rolling prairies, beyond the plains, in the land where change is unknown, where all is dry heat and dust and silence unbroken—afar from the struggle of life and for life, way out into that region of silence and death, where one dry hill is like another hill, one parched valley like another parched valley, one sage bush like another sage bush, and one day like another day, and each a hot eternity—where water is more precious than gold and as unattainable—out into this land of changeless rest there once rode out some intrepid explorers, led on by thirst for gold or by the restlessness and recklessness of frontier exploration. As they wended their way through the dust of a deep and wide canyon they saw high up in a niche on its precipitous wall something that looked very much like a wall of human construction. After much labor in hunting up the ancient ascent, they climbed the height and entered a dwelling whose walls had not echoed a human footstep for untold ages. For in that country of everlasting repetition and of eternal sameness the hand of time is stayed and leaves no mark by which to reckon. The rudely constructed walls were inspected, one room after another was explored, until, turning to one of the walls, they stood spellbound, facing a message from the past that yet spoke of common humanity as no written volume could. There, on the rude plastering of the wall—plaster laid on of light-colored plastic clay—stood impressed, plainly and clearly cut, the imprint of the hand of a little child, standing just as the happy, romping little pagan had hastily placed it in careless baby exuberance. The bearded men stood spellbound and in silence, gazing at the message. Not a heart but warmed for the little one, as warms every human heart ever for the little prattlers; but here they realized that this child had grown up, sickened and died, old and wrinkled perhaps, as had his children and children's children. For all they knew that hand might have impressed that clay in the days when Romulus ran his strange dairy in company with his brother Remus. That hand might have made its imprint there, for aught they knew, back in the days when the waters of the Nile carried on their bosom the ark that bore that sleeping babe, Moses, drifting, circling, eddying, only a speck on the dark, surging waters, and yet destined for the redemption of a nation. What this prattler was they knew not; whether he was humble or great, king or burden-bearer, he and his people had perished and their bones were dust. As a people they had been obliterated and wiped out. Their language, their legends, their very gods had perished, and all there was to show of a nation was the print in that faithful clay matrix of that hand, and that, too, the hand of a little child, careless and happy, and accidentally and thoughtlessly imprinted.

Like the little child, you and I are leaving the imprint of our hands in the history of clayworking and in the history of the world. Your imprint will be none the less lasting than

was that of the little child, but it will not have that element of accident that his had, for you are using system and research that follow on to complete and definite results, and with mathematical accuracy leave the work once done well done, reaching clear through to a definite conclusion. Putting in with your labor and effort as you go along the “potter's grit” that I am sure you will mix in judiciously with the research and opportunity you have here open to you, you will leave the mark of your hand clear and distinct in the clay wall of the world's history, and it will be no impress of an infant or child, but the mark of a strong, mature, diligent and honest man.

W. D. GATES.

GERMAN NOTES.

THE “TECHNICAL RUNDSCHAU” in a recent number discusses the difficulties attending bricklaying in the winter time. Usually brick-mason work is suspended when the temperature falls to about 28 degrees F. If work is to be carried on at a temperature lower than 26 degrees, it is well to mix the mortar with warm water and to warm the brick over a light coal fire. Foundations can be built in cold weather with comparatively little risk if the finished parts are immediately covered with sand. The lime, before using, should be covered with sand and the brick protected by boards or straw. Special care is required where cement mortar is used, which in fresh brick-work is destroyed already at from 24 to 26 degrees. This difficulty is overcome by adding salts to the mortar, thus lowering its freezing point. An addition of 2 per cent. of salt proved quite satisfactory. At Saint Jares a bridge was built, using mortar containing alum, at a temperature of from 14 to 5 degrees. Ammonia soda, obtained on a large scale in the Solvay process of making soda, is an excellent substance to add to mortar for lowering the freezing point of the latter. For this purpose four pounds of this salt is dissolved in five quarts of water, the solution to be kept at a temperature of 80 degrees. For use it is diluted with equal parts of water and added to the mortar according to the temperature. The bricklayers, when working with mortar thus prepared, should wear rubber gloves. For fronts the use of salts is not to be advised, on account of the efflorescence which is sure to appear when warm weather sets in. Ordinary lime mortar may be used without danger down to a temperature of 22 degrees, if the lime is slaked in the mortar-box and is mixed with sand and worked while hot. In Norway unslaked lime is always used during the winter, and Norwegian builders claim that walls built in winter are stronger than those put up in the summer. They build walls at temperatures as low as 13 degrees below zero.

Last month a new ceramic school was opened at Bunzlau, an institution of which Dr. Pukall, for a long time chemist at the Royal Porcelain Works, is director. The object of this school is to train young men not only in the application of chemistry and physics, but also in artistic handicraft. Three-quarters of the time are devoted for work in the shop, for drawing and modeling. The institution consists of two independent schools—a day and an evening school. The former constitutes the regular course and requires two years. The branches taught are as follows: Drawing and painting, eleven hours; modeling, six hours; theoretical and practical chemistry, eleven hours; physics, one hour; mineralogy, one hour; German, two hours; mathematics, two hours; work-shop practice, fourteen hours; making together forty-eight hours per week. The requirements for admission are very low and the fees nominal, the school being supported by the government. The instruction in drawing begins with elementary work, proceeding with charcoal, lead and pen drawing, and ending with original work in water-color painting and decorating. Likewise, in modeling the pupils acquire a good working knowledge of this branch, varying, of course, with the individual artistic ability of the pupils. The branch of chemistry includes qualitative and quantitative analysis of bodies and glazes and their reproduction, supplemented by the discussion of glazes, colors, kiln systems and machinery used in practical work. Original work is required in the production of glazes. In physics the elementary principles of mechanics, magnetism, electricity, heat, light and sound are treated. In mineralogy the composition and physical properties of minerals used in ceramic work are discussed, together with the most important geological facts. Work-shop practice accompanies the theoretical instruction, and comprises the washing of clay, mixing, turning, molding, drying, burning, glazing, slipping, decorating, plaster molding, etc.



OFFICIAL ANNOUNCEMENT.

**Pittsburgh the Place, February 15-18 the Time,
for Twelfth Annual Convention of the National
Brick Manufacturers' Association.**

To the Members of the N. B. M. A.:

AS PREVIOUSLY ANNOUNCED, the next annual Convention of the National Brick Manufacturers' Association will be held at Pittsburg, Pa., Tuesday to Friday, February 15 to 18, 1898. Pittsburg's central location and unsurpassed railway facilities make it an especially desirable point for conventions of all kinds. Her great clayworking interests, and the fact that her representative brick manufacturers have been identified with our Association in years past, make it peculiarly available for us at this time.

—Hotel Headquarters.—

The meetings will be held in the banquet hall of the Monongahela House, which hotel will be headquarters during the Convention. Delegates and those accompanying them will be accommodated at a uniform rate of \$3 per day, excepting, of course, those who desire special accommodations, such as parlors, rooms with bath, etc., for which the rate will be \$3.50 to \$4. Those who will be accompanied by ladies and others desiring special accommodations are requested to write to the hotel direct, ordering reserves, stating exact time of intended arrival, and the character of accommodation desired.

—Reduced Railroad Rates—

Have been secured on the certificate plan; that is, delegates and those accompanying them, if they pay full fare going and *take a certificate for same* from the ticket agent, will be entitled to return tickets at one-third the regular fare, making two-thirds rate for round trip. Those starting from small towns should make inquiry from local ticket agent a few days in advance, to insure the receipt of proper certificate. Where same cannot be obtained, however, a receipt from the ticket agent bearing *official stamp of ticket office*, and stating that it is for full fare and in lieu of regular certificate, will suffice.

The programme, which has not yet been completed, will include the following addresses and essays, each in turn to be followed by general discussion of the subject under consideration.

—The Programme.—

"Looking Forward," J. C. Adams, Indianapolis, Ind.

"The Use of Electric Tramways in Hauling Clay," Charles W. Eiker, Chicago, Ill.

"Burned Clay as a Fire-Proofing Material," W. D. Henry, Pittsburg, Pa.

"The Economy of Brick as Compared with Frame Structures," R. N. Buell, New Britain, Conn.

"Brickyard Construction," Frank W. Butterworth, Marion, Indiana.

"Drying Brick in Kiln by Use of Heat from Cooling Kilns," S. H. Alsip, Belleville, Ill.

"Why Some Brickmakers Live in Wood Houses," T. D. Potter, Gardner, Mass.

"Experimental Work, Wise and Otherwise," E. E. Gorton, Terra Cotta, Ill.

"Brickmaking in the Far Northwest," Walter S. Bowen, Little Falls, Wash.

"Preparation of Clay for Soft Mud Brick," C. L. Merriek, Syracuse, N. Y.

"Brickmakers' Accounts," W. H. Hoagland, Cayuga, Ind.

"The Advancement of Paving Brick Tests," Arthur W. Sewall, Pittsburg, Pa.

"The Refractory Qualities of Clays," Prof. Edward Orton, Jr., Columbus, Ohio.

"Manufacture and Use of Press Brick in the South," Lee Dunn, Lake Charles, La.

In addition to the foregoing subjects, many other questions of vital interest to the brickmaking craft will be fully discussed. One session will be devoted largely to the fire-clay industries, and it is expected that a large delegation representing that branch of clay work will be in attendance.

Brickmakers of America are each and every one cordially invited to attend the Convention and participate in the deliberations. Those from across the water, if any there be who can attend, will also be made welcome. Those desiring information relative to requisite of membership, etc., are requested to address the Secretary at Indianapolis.

THE EXECUTIVE COMMITTEE,

WM. H. BRUSH, President.

THEO. A. RANDALL, Secretary.

THE CERAMIC ASSOCIATION OF THE OHIO STATE UNIVERSITY.

On the evening of November 9th the association had the pleasure of listening to an address by Mr. W. D. Gates, President of the American Ceramic Company, Chicago. The subject was "Potters' Grit," and it was handled in the charming style characteristic of the author of the "Buttonhole Talks." The lecture was not a technical one, but rather one of the moral kind, in which the speaker pointed out that grit was not only an essential ingredient of the potter's body, but also of the clayworker's mental make-up. The audience was a large and appreciative one, a number of students not members of the association being present.

Technical papers and discussions made up the programme of the meeting held on November 23d. Mr. W. D. Gates gave a description of the manufacture of terra cotta. This was followed by a general discussion, in which the important points of the paper were brought out. The second part of the programme was a lecture by the President, Mr. A. V. Bleininger, on "Portland Cement," in which he discussed the chemical character of the cement, its physical properties and peculiarities, its manufacture and use. The lecture was illustrated by blackboard diagrams and formulæ showing the composition of cement and its varying properties. The paper was followed by a lively discussion, and much interest was shown in the subject, which the speaker demonstrated to be fully within the scope of ceramic chemistry.

Owing to the inability of the next lecturer in the ceramic lecture course, Mr. Mueller, Superintendent and Sculptor of the Zanesville Mosaic Tile Works, to come to the meeting of December 7th, it was decided to postpone it to December 14th, at the request of Mr. Mueller.

WILL HAUL BRICK BY ELECTRICITY.

The brickmakers of Springwells, a suburb of Detroit, are interested in the new electric line from Detroit to Ann Arbor, as they believe it will furnish them with a market west of Detroit, which they have never had. Secretary Russell also has a scheme for facilitating the hauling of brick, which will be put in operation as soon as possible. Several of the yards are already making preparations for building spur lines, so that the brick may be loaded onto the cars, which will do away with the long haul by teams. The intention is to have a crane at the yards, which will lift the wagon boxes directly onto the car, which will be run to a general distributing point in the city, where another crane will place the boxes on the wagons, thus saving a haul of five miles and much time. It will also do away with much of the heavy traffic on Michigan avenue.

Jno. Snyder of Piedmont, Mo., writes that he will probably start a brickyard in the Spring.



THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Laying of Paving Brick.

Editor Clay-Worker:

The tables in the October Clay-Worker by Professor Baker are quite interesting and useful, but open to one practical objection, which I hope the Professor can explain. The top courses in Table 2 are calculated on $\frac{1}{8}$ and $\frac{1}{4}$ joints. I understand that these joints are on the sides and ends of each brick, so that a brick, say 8 inches long by $2\frac{1}{2}$ inches thick, will lay a space of $8\frac{1}{8}$ by $2\frac{5}{8}$. The impractical part consists in laying dry brick with open joints. The work of laying paving brick is usually done very rapidly, and there is no time to see that each brick is separated an eighth or a quarter-inch from the adjoining brick. I have never heard of brick being laid with open joints, and yet it would seem that there must be something in it, else the Professor would not have made such tables. If, then, the brick are not separated, but placed hard together, end to end and side to side, will the correct number of brick be found by taking the number in the next row above? Example: Table No. 2 says brick $8\frac{1}{8}$ by $2\frac{5}{8}$, with $\frac{1}{8}$ joints, require 57.1 to the square yard. Does this mean that if brick of this size were placed close together, it would require 58.1 to the yard?

J. K. CALDWELL.

ANSWER BY PROFESSOR BAKER.

The tables assume that the brick are laid as close as possible, but owing to the little irregularities of form ten brick laid side by side will measure more than ten times the nominal dimensions of one brick over. The tables provide for quarter-inch joints in the bottom course and only eighth-inch and quarter-inch joints in the top course, on the assumption that the bottom course will probably be laid with rough brick, while the top course may or may not consist of rough brick.

The answer to the question propounded by Mr. Caldwell is, Yes; but brick can not be laid with their sides in actual contact.

IRA O. BAKER.

Is the Gas Engine Suitable for Brickyard Purposes.

Editor Clay-Worker:

The times were never hard with us here; last season especially was a good one. I made about 2,500,000 common brick, besides having a good trade with press brick and sidewalk tiling. I also made about 100,000 press brick, which were used in a railroad station at Tracy, Minn., and several brick blocks here in Springfield. I have been making all common brick by horse power with a New Quaker machine and using a tempering wheel for a pug mill. The sidewalk tiling and drain tiling I made with a Kells wire-cut machine, which was run by a gasoline engine. I intend to run all my machinery by a 40-horsepower steam and gas engine, and will also abandon the tempering wheel and will buy me a large soft mud machine of greater capacity.

I would be very much pleased if some of your readers who have had experience with gasoline engines would give me their views on the subject, stating whether in their estimation a gas engine of 40-horsepower could be run successfully and economically. Soft wood costs \$3.25, soft lump coal about \$5 a ton, and gasoline 10 cents a gallon.

Here is my subscription for another year. I appreciate the Clay-Worker very much, and especially in the winter months it is very valuable and an instructive entertainer.

With the compliments of the season, I am

Yours very truly,

A. C. OCHS.

Springfield, Minn., Dec. 2, 1897.

COME TO DECATUR.

An Appeal to the Clayworkers of Illinois by one of Them.

Editor Clay-Worker:

As an officer in the Illinois Clayworkers' Association, will you permit a few lines in regard to our coming annual meeting at Decatur? As an introduction, will say I can but wish that my pen might draw a picture that would open the eyes of everyone of the eight hundred and fifty firms in our State connected with the clay industry, and therein see the value, feel the interest and then show that appreciation this association deserves—that they might be induced to say, "This meeting must be attended," no matter what comes or what self-denial it causes. If this could be instilled in every brother's heart, would there not be rejoicing at Decatur? Would you regret it? Would any member regret it? Probably no one can figure out to the exact point how much he has gained after attending the annual meeting, and on first thought may say that much is thrown away. Is this a fact? Don't you know it takes twelve months to correctly figure it? and at the end of that time you know it shows it and needs no figuring.

Perhaps some one will say, "What good will it do? I won't sell anything more by it." Grant that fact, if necessary. Can he truthfully say that is all there is of the clay industry? Did you ever think, my brother, that it is almost impossible to go through this world alone? That other people have a claim on you? That if you go through this world following nothing but a chunk of clay in the shape of a brick or tile that you are not fulfilling that position given you by the Almighty, and in fact are but little better than that chunk of clay—even unburned?

If we are not willing to assist each other or to be ever ready to learn something for our own good and our posterity—to make life as large and full as is possible for us to do—why are we given the power to enjoy the thousand and one blessings that are continually showered on us by man every day we live?

At the first meeting you attend perhaps you will feel somewhat embarrassed and cannot enter into the spirit of the meeting like the old wheel-horses; but the simple fact of commingling with all classes of men who are in the same line of business makes "brothers of us all." You are one of them. You have just as much liberty as any; your vote is just as big and your presence just as necessary. In this meeting they are "all the same size," and the big operator is as keen for new ideas as the one with the horse-power machine, and the chances are the small operator has ideas the larger one never dreamed of, and with which he would gladly experiment in a most thorough way.

That brings out another thought: First, last and all the time, do not lose the point that you will not, cannot, afford to miss this meeting. Then be sure and take some point with you. Your ideas may be quite different from your nearest neighbor's, and perhaps you may start a train of thought that will be of great value to all concerned. Take your note-book, if necessary, so you will not miss the many good things that are dropped by the older ones who have been through the mill and probably know more about clay work than you. If you are troubled with bad dreams caused by your clay not working right or your kilns not burning good or your machinery running awry, take them to the meeting, and, ten to one, you will return to the wife of your bosom with pleasant tales, and your dreams will be sweet as a clover patch, and your troubles will be only as a stimulus to further trials and greater victories.

Remember! This is your meeting; nothing more, nothing less—a meeting of the clayworkers for the clayworkers and by the clayworkers; and you are one of them.

H. F. TOWNSEND.

A Year of Disaster for the Lower Mississippi.

Editor Clay-Worker:

The kindly sentiment you expressed in a recent issue welcoming the coming of "Jack Frost" and speeding the departure of "Yellow Jack" was echoed by all of us here in the South and very warmly. I am pleased to say to my many friends in the North that though my family and myself remained at home during the epidemic we all safely escaped the scourge, and now hope and trust that we may escape from such epidemics in the future. It is a trying experience.

We are not sorry that 1897 is nearing its end, as it has been fraught with a continued series of disasters to our city and

State, first of all by the visitation during the early spring and summer of a long-continued drouth creating much suffering to man and beast. This was followed by the disastrous inundations throughout the river districts, causing much loss of life and of millions of property. Thereupon followed the numerous bank failures, causing much distress financially, and our last, though not least, winding up with the yellow fever scourge, giving us a series of calamities that can be truly likened to the ancient Egyptians, who were stricken with the seven plagues (pardon the antediluvian allusion).

Business, in consequence, has been paralyzed, especially in our line, and believe to have made money by keeping the yard closed this year. But there is no use in crying over spilled milk, as I have found it unprofitable employment. It behooves us, therefore, to put the disagreeable part behind us and strive with a determined effort and resolute hearts to extract all possible advantages out of the future.

I am in hopes of being able to meet you and other friends in Pittsburg at the coming Convention, and certainly will anticipate much pleasure in renewing old acquaintances and the forming of new ones. In the meantime may we not anticipate the pleasure of your promised visit, when, rest assured, you will receive a right hearty welcome.

I shall go over the field and see what can be done toward getting new members in this section to interest themselves in our association and hope soon to be able to report good progress.

J. A. BLAFFER.

New Orleans, Nov. 22, 1897.

Looking After Home Markets—Reply to Hydro-Carbon.

Editor Clay-Worker:

I was considerably amused at Hydro-Carbon's tirade against the poor "down-town" brickmaker who was so impudent as to invade the West Philadelphia brickmaker's territory and dump brick at the said West Philadelphia brickmaker's doorstep, as it were. If Hydro-Carbon is going to take up the cudgel in favor of limited competition, our firm, for one, will agree to keep off the West Philadelphia brickmakers' stamping ground, if they will agree to keep off of ours and leave to us what was usually looked upon as the down-towners' own and exclusive field. But right here Hydro-Carbon gets into trouble. In forming his limited territory "keep-off-the-grass" combine he would leave himself and also the brickmakers who would enter into it open to the charge of forming a "combine" (a bad thing in Philadelphia to-day, apparently)—a trust, as it were; and if this were to be followed by a tirade from the public and newspapers, etc., similar to what followed the formation of the Chicago trust of two years ago, we don't want any of it in ours, thank you.

If Hydro-Carbon wrote his letter from the view-point of a public-spirited citizen, then, of course, he cannot be accused of wanting to form a "keep-off-the-grass" combine or trust, because we all know that the average public-spirited citizen is not in favor of trusts or combines, although he is just as eager to benefit by the cheapness of all manufactured materials as the average citizen who is not so public-spirited.

I agree with Hydro-Carbon that Philadelphia is divided nicely as to the West Philadelphia, down-town and up-town territories, as far as the brickmaking and delivering is concerned, but right here the equal division or nicety of the arrangement stops. The brickmakers have no control over the building operations or the development of the different territories thus described. Actuated by different impulses, or convinced by sound business reasoning, the operative builders have at different times created what might be termed a distinctive local building boom. During the early eighties brick were dumped into the down-town territory from all quarters. The builders wanted them; they needed them; the down-town brickmakers could not supply the demand. After that rush the operators started in to develop the north and northwest end, and the boom there for years was something terrific, lasting some eight or ten years. Brick were hauled from all parts of the city and hauled in from near-by country yards by the railroad. There was no talk then of invading each other's territory. The boom has now come on in West Philadelphia, brought about by the increased facilities offered the public to reach that quarter of the city quickly and cheaply, the electric railways going miles into the heretofore undeveloped portion of our great city and by reason of cheap fares causing the steam railroads to reduce fares and give more and better service in the same quarter.

The operators from down-town and up-town, who concluded that they needed a change and saw more money in building up this territory, forthwith started in to assist their West Phila-

delphia friends to build it up. Naturally, the down-town brickmaker follows his good customer to West Philadelphia, and seeks a share of the trade thus directed from his territory for the time being. There was no talk of fierce and unmanly competition, ungentlemanly and unbusiness-like conduct a few years ago, when prices were good and everybody satisfied. All this talk about fierce and unmanly competition, etc., etc., to my mind, is rot. There is no question about it but that competition is very severe in all quarters and all business; but who can you blame for it? Where can you start in to pick out the unmanly fellow? We all have our business established, our money invested; we have to earn our living; few of us know any other way of doing this than by the business we are engaged in. To stop means to go back. You lose your trade. People forget you in a year. Idleness ruins your plant—and there you are. The only way to do is to keep on and hope, and that is what we are all doing. (We Republicans have quit hoping and are going ahead, leaving the other fellows behind to keep on hoping. Hoop la! Yellow dollars, dollar yellow wheat and red hard brick \$8! "Who sez I'm a Demokrat?")

We all keep our plants running, and sell at the best price we can get, hoping to get through with a margin to the good, keep our trade, and be in the market to get whole when the good time comes again, as it eventually will. So don't start in to call the other fellow hard names because he gets a job that you think you have pre-empted. You don't know, maybe, what he thinks of you, and anyhow, in about two years from now, when we are all busy and prices good, we will forget all this until it comes around again in the wheel of fortune, and wonder why we ever said such hard things about our neighbor brickmakers.

I should quit now and not take up any more of your valuable space, but I want to say to Hydro-Carbon, before leaving, that if he referred to our firm particularly in his letter, the facts are not as he guessed them, but are as follows: We dumped four million brick or more into West Philadelphia this year. The man wanted our brick. He gave us a better price than was and is now prevailing in the market. He paid us cash every month three days after he received his bill. He got good brick, we got his good cash. We made money on the operation, and are satisfied to close another deal of the same kind to-morrow if it comes along our way.

A DOWN-TOWNER.

Philadelphia, December 3, 1897.

Can Drain Tile be Substituted for Iron Pipes?

To the Editor of the Clay-Worker:

The writer has been thinking some lately. This may seem a strange and rather rash statement to make, yet 'tis a fact. The thoughts might possibly have passed into "desert air," but circumstances have had an effect, the result of which is this writing. That word circumstances has a great power. Had I the time and the pen of a Webster I would like to write a book about circumstances—a big book it could be, too, in connection with the brick and tile or clay business in general. Methinks that book will touch a responsive chord in every brother's breast and cause a sigh that would mean, "Yes; I've been there," or, "Yes; that's the trouble with the clay business; no single rule fits all cases." But I digress from my subject.

The circumstances governing me are in a series. The first happened while running the motor hauling clay and nearly caused me to stop then and there and jot down what I wanted to ask.

The next time it struck was when the last brick was removed from a pile that had been standing as a monument to hard times and I picked up my fountain pen, that was last used in the cause of "Drain Tile for Irrigation Purposes." The next was when entering our office I found the postmaster had sent us a large roll of weather charts that had been strung on a wire hook each morning in the two by four postoffice and which were carefully scrutinized each morning by the retired Methodist preacher and the near-sighted school ma'am. To sum up the circumstances I find, first, the idea, then the pen and ink, then the paper; nothing else needed but the great trouble to get it. Now while the rain is pattering gently, musically and steadily on the pavement and dripping very systematically through a leaky roof that I would not fix when it didn't need it, you find, to your sorrow probably, that I am at it.

Perhaps, Mr. Editor, you think I am writing this for fun or to fill space. Cast off such thoughts, for 'tis not true. The fact is I have an "ax to grind," but am perfectly willing to hold or turn the crank.

"Listen to my tale of woe!" A hot floor platted with brick, underlaid with gas pipe six inches apart, has given out. The

pipes have rusted "beyond recall." The floor was a success for what it was intended and would like to repeat. Now the question is, Why not lay three or four-inch drain tile, cement the joints, level over the top with three or four inches of sand or cinders and then plat with brick? Has any brother tried it? The question alone with me is, Will the cement hold? Will the expansion and contraction on a sixty-foot floor break the joints and allow the steam and water to escape?

Our aim in having this floor is two-fold. Have a hot floor for drying purposes and condense all steam possible.

If any brother has been "through the mill" and will donate his experience to the cause through your columns will not more than the writer be grateful? Yours, H. F. T.

Building Operations Still Booming.

Editor Clay-Worker:

Our ward, the thirty-fourth, is again far ahead of any other ward in our city for permits and operations in November. With a total of 1,043 operations, at an estimated cost of \$1,169,485, we are down for 130 operations at a cost of \$182,375, or about 12 per cent. of all the operations in Philadelphia for November and about 16 per cent. of the total cost. This is the record breaker for permits and operations, but only exceeds one of the four preceding years in estimated cost, last November (1896); the estimated cost of 761 operations was \$1,085,690, or \$83,795 less than November, 1897, while November, 1893-4-5 exceeded this by \$46,000 to \$205,000; therefore I see very little to boast about on the whole, but feel justified for the prominence I am giving our ward. Our West Philadelphia yards can stand a good season or two without losing their heads. They are all very level in the top story and not badly fixed. It is rumored that Brother Conway is about to add a soft-mud machine to his plant. This is what the Sullivan boys did, and this season they have even abandoned that and are running a few hand gangs. True, they have no clay, nor had they when they put in their "Wellington." It is further rumored that young Lloyd has at last secured brick sales enabling him to purchase that new suit he has been craving for months. Mr. Lloyd senior is an old landmark in West Philadelphia brick-yards, a very conservative business man and a well-known man on the streets, active, good looking, well preserved and well dressed, and neither he nor his son believe in running a brickyard for fun.

—Largest Brick Manufacturers in the States.—

Some time ago I think I saw it claimed that Chicago produced more brick than any other city in the Union. If this really is so, then our census needs revising, for it credits Philadelphia with being considerably ahead of New York or Chicago, and further says we have eighty brickmaking establishments, besides sixteen others for the manufacture of pottery and clay products; and yet we bear our honors with becoming modesty.

—Let Sky Scrapers and Steel Skeletons Go Ahead.—

Dame rumor informs me that two or three more of these rather unsightly structures are being projected in this city. One, I understand, is to be twenty-five stories high, and if it is modeled after the latest one on Broad and Chestnut we shall have a Darby and Joan sure enough—the plainest of plain buildings, with nothing to gush over architecturally, on the outside at least. However, let that go for the present, and leaving architectural ugliness, which only riles me, let me turn to something which not only pleases me, but corrects some of the ideas I had formed concerning fire-proof materials. I now begin to see that fire-proofing must be cooling proof too to fulfill its whole duty. The extracts from Maj. W. L. B. Jenney's address, published in the November issue, and the article by "Waverley" on "The Manufacture of Fire-Proofing" in the same number, are well worth the subscription price for one year to those interested in fire-proof manufactures. The first named shows us what is required and the last tells us how the Dennison Brothers make it at the Delaware Works, Ohio. I also derive much pleasure and instruction from those elaborately illustrated articles on "The Development of Hollow-Block Manufacture," by E. G. Durant, and am eagerly looking forward to the next portion of Master Mechanic's papers on "The Use and Abuse of Clayworking Machinery." The above are all good, solid, practical reading, something to think seriously and soberly over. I very often think fire-proofing and hollow blocks will eventually supersede common and repressed building brick. One thing I observe in common with many more, that red front brick are taking a back seat—nay, more, they are being thrust out altogether. Nearly all the buildings put up in our ward the past two seasons have had some variety of Pompeian or buff brick fronts. I also observed that

buildings stood for a week or ten days waiting for front brick. Can nobody in this city make these but the Jarden Brick Company? If not, why not? A. STRETCHER.

Philadelphia, Pa.

A Familiar Ring.

Editor Clay-Worker:

For several years the Clay-Worker has been such a regular visitor at our home that it seems like one of the family. But when we look over its pages and see the familiar names of our old authorities on brick and clay work who have their names enrolled on the books beyond, we think, as we look back over their advice and counsel, that they have builded their monuments in such a workmanlike manner that the fellow-travelers who follow in their path will ever look upon their works with a feeling of thankfulness.

We have put in at our plant one of the New South brick machines, made by our old friend J. C. Steele, of Statesville, N. C., one of his "Extras" and automatic cutters; and, judging our old friend Steele by his machine, he is true to his name—a first-class quality of "Steele," one that can be relied upon to hold an edge even in a tough shale clay.

Brick in this market seems to be in fair demand, though the price has not reached the crest of that promised wave of prosperity, and I am afraid never will. We brickmakers, though, are somewhat to blame for low prices, at least in many cases. Some believe in luck in burning, and if a good burn is made there is good luck, and if a bad burn bad luck. If brick are poorly burned (and any practical man knows that burning is what makes the brick, after all,) they are sold at a low price, and some "cheap John" builder works them off on a building and uses the difference in prices to out-figure some other builder. So, too, the insurance companies never take into consideration the quality of brick in a wall, and we find some public building inspectors who can be color-blind at certain times, and then a half-burned brick is called hard, and so on.

We have made it a rule to make and sell only hard-burned brick. Our market has only two classes—hard, and salmon or soft. We do not try to dispose of salmon brick, because we have but few to sell, and if we sell them at all we ship them separate and make a difference in the price, but not enough to pay for the use of them in place of hard-burned. We have learned by experience that it is better to burn our brick done, and not encourage the use of salmon brick at all.

All brick so styled "hard" are not. Not long ago there was an inquiry for quite a number of brick in this section demanding a hard-burned brick to be used in the foundation of a very large, heavy structure. We sent some samples of what we considered hard brick to the civil engineer, requesting him to examine them carefully, and to break them, for to judge a brick from its outside appearance in regard to its being hard is not a fair test; that a great many so-called hard brick are simply hard-burned on the surface, or veneered, so to speak. The center will show a different color, which proves that the brick were only partially burned. The result of the civil engineer's examination was to the effect that the contractor who had the work in charge was to use our brick for the whole job if they could get them. I do not write this to boast, but only to show to anyone interested that to examine your brick closely, break open some from different parts of the kiln which you may think are hard-burned, and if you see that they are not burned through and through, the next time keep your kilns at the right heat and give the brick time to get as hot in the center as on the outside, and you will have a thoroughly hard-burned quality and less talk of whitewash. I have noticed some lengthy papers on that subject, but, as Captain Brag was told, "Give them a little more grapeshot," give your brick a little more time, and in nine cases out of ten the other fellow will talk whitewash. May the Clay-Worker be as good in the future as in the past, and there will never be any danger of its pages whitewashing. J. W. CRARY, JR.

Florida, Dec. 3, 1897.

A Good Year—Commends the Rattler Test.

Editor Clay-Worker:

I am glad to send greeting and say all's well in these parts. We have closed down for the season with a total production of 8,500,000. As our making season in this part of the country is necessarily short (about seven months), we look on this as a very satisfactory output. Trade has been fair to middling, but has now taken a Klondike turn, and from present indications there will be very little stock on the yards at starting

time next year. We have not had such a general demand for "lo these many moons," and the "braves" are correspondingly happy.

It may interest you to know that we have had made an N. B. M. A. standard rattler, and have made very many tests of our paving brick, resulting in the development of conditions we had either not thought of or deemed of no importance. One thing is certain—we know more about paving brick through these experiences than we did before, and we value the knowledge. We cannot speak too highly of an intelligent use of the rattler as an educational medium, especially if every new feature presented is followed to its source. In this connection it is with pleasure that I congratulate all concerned in the preparation of the last Convention report. It is by far the most valuable ever issued, and that means much, and ought to be found in every progressive brickmaker's library. It makes a man feel proud of his membership in an association that has done and is still doing so much for the advancement of the science of brickmaking.

I hope to meet you, and the biggest Convention yet held, at Pittsburg, and to see the good work advanced another stage. If any encouragement is needed to spur up the lukewarm, I think the announcement that Brother Dibert is at the helm of affairs will fill the bill. It speaks volumes for the success of the social side.

LaPrairie, P. Q.

Fraternally,

J. W. CARSON.

Corn as Fuel.

Editor Clay-Worker:

Since writing my last article, in which "corn to burn" is incidentally mentioned, it has come to my knowledge that it is no uncommon thing to use corn as fuel in some of the Western States, where coal is very high in price on account of the distance from the mines. I came, also, across a paragraph making a round in the papers stating that corn had a much greater heating power than coal; the statement, however, was wanting in that definiteness which stamps the utterances of the careful observer, while actual tests, both practical and theoretical, go to prove that it has no foundation whatever in fact. There is no denying, however, that corn is a fuel, and not a bad one either; everybody nearly has proved the efficiency of the corn cob—what a hot fire it makes, how easily and freely it burns, how clean and free from ashes, etc. Now, there is a why and wherefore for this, and it is not one of those deep and abstruse problems which requires a giant mind to solve, but is so plain "that a wayfaring man, etc., need not err therein" if he will carefully and patiently observe and compare notes; he has observed how much easier and quicker he can get a hot fire with soft coke instead of hard, and the same with soft and hard coal, also with soft wood and hard, and he has probably arrived at the conclusion that one and the same reason accounts for all, namely, density, or specific gravity, the least dense, or lightest, presenting the largest surface to be acted on. Of course, there must be some consideration for the composition of the material; those, however, given may be considered practically alike, that is, so far as the solid, or carbon, constituents are concerned—in fact, the coke may differ only in its mechanical structure.

Now, the corn cob may be looked upon as identical with a piece of wood in composition, but more porous in its structure, consequently not so dense; therefore, a given weight of corn cobs, say one pound, would be much more bulky than a pound of wood and much more still when compared with a pound of coal.

In making comparisons of the efficiency of different fuels there must be no guesswork. The real value of fuel is measured by the amount of useful work that can be got out of it. Calorimeters give us a pretty accurate idea of the units of heat in fuel, but the verdict of the calorimeter and that of the furnace do not always agree perfectly; yet, as far as I know, they never vary much.

Many people still seem to confound temperature with quantity of heat; the difference has been set forth several times in this magazine, but passed over without receiving the attention the subject demands, and that is the very reason why such erroneous statements—as the heat contained in corn—get promulgated. There is no difficulty in making a good, practical test of the solid fuels; it is more a question of care and conscientiousness than scientific ability. The principal points to note are weight of fuel, time to burn it and results obtained, taking care that each test is conducted under precisely the same conditions, or as nearly as is possible. Under a steam boiler a six or eight hours' test is generally sufficient, although a longer one is usually more satisfactory; in a kiln a whole burn would be necessary. By the by, a kiln of bricks burnt

with corn, giving all the details of the burn, would be interesting matter for the Clay-Worker readers. If anyone is inclined to try such an experiment the value of both corn and coal will be found in the table below, which is based on actual tests in calorimeter and under a boiler.

—Quantity of Heat and Temperature.—

For the benefit of those clayworkers who are guided in their estimate of a fuel by the hot fire it produces, let me again lay before them an example of the error they fall into. If a certain weight of fuel, say one pound, burns with a temperature of 2,000 degrees for thirty minutes and another pound burns at the same heat for only twenty-seven minutes the ratios in value would be 27 to 30, or if the first cost \$3.00 per ton the other is only worth \$2.70 per ton, other things being equal, but if one burns thirty minutes at 2,000 degrees and the other burns twenty-seven minutes at 2,100 degrees, then their ratios in price would be as \$2.84 to \$3.00. So you will observe that time is a factor that we must never lose sight of in estimating the quantity of heat, and while writing this it occurred to me that it is now a comparatively easy matter for the clayworker to measure the temperature of his fires in the kilns or in the boiler house by means of the segar cones.

The rapidity with which fuel is burned is also a comparative measure of the temperature produced. The condition of corn cobs is very favorable to quick combustion, with the consequent high temperature; hence the hasty conclusion that they contained more heat than coal.

—Corn Versus Coal.—

The tests of corn versus coal mentioned above were made by Prof. C. R. Richards, of Nebraska University, and published first by the Press Bulletin issued by the experimental station early last January and later in the October number of Casier's Magazine, from which the tables and other statements in quotation marks are copied. Two boiler tests were made—an eight-hour test of corn and a six-hour test of coal; corn consumed, 5,232 pounds; coal consumed, 1,888 pounds. "The coal was Rock Springs, a good, free-burning, non-coking, bituminous coal, containing a very small percentage of ash, costing \$6.65 in Lincoln, Nebr. The result of these boiler trials showed that coal gave 1.9 times as much heat as corn." * * * "Samples of the coal and corn were burned in a fuel calorimeter and the ratio of these results was that coal gave 1.86 times as much heat as corn." Many more tests were made and from the average heating value of coals and corn the following table was computed, which shows the cost of corn per bushel to equal that of coal selling at different prices:

Coal per ton.	Corn per bu.	Coal per ton.	Corn per bu.
\$2.00.....	4.9c	\$5.50.....	13.4c
2.50.....	6.1c	6.00.....	14.7c
3.00.....	7.3c	6.50.....	16.0c
3.50.....	8.5c	7.00.....	17.1c
4.00.....	9.8c	7.50.....	18.3c
4.50.....	11.0c	8.00.....	19.5c
5.00.....	12.2c		

The purport of this table is to show that when coal is \$6.65 per ton, corn selling at 16 cents per bushel would be the cheaper fuel; and when corn is selling at 10 cents per bushel, as it was when these tests were made, coal at \$4.00 per ton would be a trifle the cheapest of the two, other things being equal.

Professor Richards encountered the same difficulty in burning corn as I did in 1889 burning cobs. The fire needed constant attention and replenishing at such short intervals that an automatic stoker is an absolute necessity for successful steam raising, etc., and for domestic purposes the combustion is so rapid and the fire so fierce that unless checked by some means the stove is soon injured, again confirming the erroneous deductions of the superficial observer that corn contains more heat than coal. I am reminded that a similar idea prevails respecting hydrogen gas, and to a certain extent this is true, but if you burn a cubic foot of each of the gases, carbonic oxide and hydrogen, you will find very little difference in the quantity of heat derived from each; if, however, you burn one pound of each you will get fourteen times the quantity from hydrogen that you get from carbonic oxide, but you will find it will require 180 cubic feet of hydrogen to weigh a pound, whereas less than 13 (12.81) cubic feet of carbonic oxide weighs the pound.

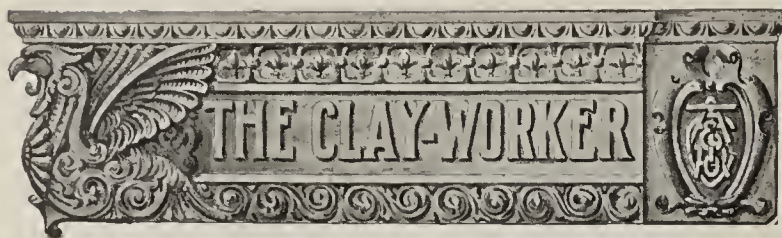
Now, if Brothers Bushnell, Carl F. Kaul or any other Western brother can give us information on corn, or any other apparently irrational fuel, I for one will heartily thank him.

WM. WAPLINGTON.

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

Mention the Clay-Worker



Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

FOURTEENTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	\$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " " " " " "	10.00
Ten copies, " " " " " "	15.00

Foreign subscriptions 65 cents additional.

Subscribers when ordering a change of address should give both the old and the new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
5 Monument Place.] T. A. RANDALL & CO., Indianapolis.

VOL. XXVIII.

DECEMBER 1897.

No 6.

CURRENT COMMENT.

Convention time is nearly here. The first of the season is that at Decatur, January 5th and 6th. As will be seen by announcement on another page, the Secretary has prepared a fine programme. There ought to be a large attendance.

* * *

A forty-horse team, with leaders like Wittmer, Albertson, Sankey, Cawley, McGraw, Hersperger, Keeling and Dibert, will make a lively procession. To keep up with it, delegates to the Pittsburg Convention will have to step lively.

* * *

Our Chicago correspondent tells of a new "combine" in that city. We sincerely hope it will prove successful, for if it does, it will mean better wages for the brickyard hands, and some profit for the proprietors. In short, it means prosperity, and that's what we all want.

* * *

To each and every one of our host of readers who have promptly renewed their subscriptions for the ensuing year we cheerily doff our tile, and assure those who have added kind words and good wishes to their more substantial contribution that we appreciate one as much as the other.

* * *

To those who have as yet neglected this delicate function, we trust these lines will prove an all-sufficient hint, while to the many who have heretofore been content to receive an occasional copy, we add a cordial invitation to join the ranks of the regulars. Come, join our forces, and we will do each other good. Now is the time to subscribe.

* * *

We wish our readers, every one, a Merry Christmas and a Happy New Year. 1898 looms up auspiciously in the distance. The business outlook is most encouraging, and we promise on our part to do our level best the coming year to make each succeeding issue of the Clay-Worker more interesting and instructive than any that have gone before.

CHRISTMAS GREETINGS.

Before another issue of the Clay-Worker, the Christmas holidays will have passed, and the annual visit of that venerable friend of children will have made old and young happy by his kind attentions to the little ones. It is a grievous mistake to assume that Santa Claus is a myth. Though it is by no means a pleasant sensation when the little ones first discover that the toys on the Christmas tree and the crullers and the candy so nearly resemble the toys and candies seen at the stores and the crullers on the home table as to create a suspicion that mother is in partnership with the mysterious visitor, yet a little later on, when this suspicion is confirmed and the truth is realized, the pleasure is even greatly enhanced by the fact that, after all, mother is the embodiment of the idea represented by the legend of St. Nicholas. That is a grand conception that there is an invisible lover of children who at least once a year seeks to make all children happy. Let it be cultivated assiduously. The Clay-Worker greets its large and growing family, and wishes a Merry Christmas in every household it visits. Be merry yourself, and make others merry also.

A HAPPY NEW YEAR.

On wishing every reader a Happy New Year, the Clay-Worker does not limit its desire to the first day only, but to every day of the year. Neither does it desire, much less hope, for a year or a single day of the year which shall be exempt from duties and responsibilities. All the days of the year will not be sunny nor all cloudy; some will be very cold, some very hot. Those may not always be in such succession as any of us would plan, and certainly not in any kind of succession that all would agree upon. Happily, we are not responsible for rains and sunshine, nor for the lack of either, and it will contribute greatly to a happy year if we leave such things where they belong. Neither do we desire that the year be exempt from labor. It is work that differentiates man from the lower animals. To be happy, we must work; to work to profit, we must be happy, and we cannot be happy if we are in a constant quarrel with our surroundings. We wish all our readers a Happy New Year, but let everyone remember that happiness is from within, not from without, and that everyone makes or unmakes his own happiness in a large degree.

CLOSE OF VOLUME XXVIII—A RETROSPECT.

If editor and publisher alone were interested in the continued prosperity of the Clay-Worker, we would be less inclined to say congratulatory words on this occasion. Fourteen years ago, with great faith in the enterprise ourselves, but amid many doubts on the part of personal friends, we entered a field never before cultivated. Other industries had had their special journals through which information could be imparted and received, but nothing worth the name had ever been undertaken in the special field of brickmaking. Was not the art as old as history, and had not all that could be known about it been transmitted from father to son, or from master to apprentice? Why, then, devote a magazine to this specialty? With more words of encouragement from heroic men who had high ideas and faith in themselves and the possibilities of their craft than words of discouragement from the fearful and faint-hearted, we launched our enterprise.

It would be presumptuous for us to claim the sole credit of the success which has crowned our labor. A little army of earnest men have been with us from the beginning—we don't say have been at our backs, for in many cases they have been our leaders, constantly beckoning us to come up higher. A braver and more faithful constituency no journal ever had.

A retrospect of these fourteen years is an inspiration for the future. It would be a narrow view to take of the then and

the now to simply compare the mechanical appearance of this number of the Clay-Worker with the first numbers issued fourteen years ago; and yet those who remember what it was will say that it was quite up to the times and their demands. Even the first number contained some valuable contributions from amateur correspondents, who had been drafted into service for the occasion; but as compared with the host of able contributors who to-day add so much to the intrinsic value of the journal, they would compare with these about as Mr. Lincoln's 75,000 of six months' troops would with his 900,000 men enlisted for the war. Our corps of contributors are not raw recruits, and the Clay-Worker owes its phenomenal success largely to them. Every number contains valuable hints from men in the field—veritable veterans they are now, most of them—and we may mention incidentally that not the least good the Clay-Worker has done is the discovery and development of men who never knew before that they had ideas on brickmaking and its kindred arts that could be beneficial to others, and that they could convey them in masterly English if they tried. We are happy in having such men to help us—in many cases to lead us.

The retrospect of these fourteen years recalls the vast improvements in the art of brickmaking, not only since the days of Pharaoh, when farmers carried their surplus straw to the brickmaker instead of the papermaker, but within these fourteen years alone; and we are sure no candid man who is well posted will deny that the Clay-Worker has contributed largely to this result, largely through our contributors, but still more through our advertising columns. Through them the brickmaker has learned what he needed to complete his plant, and the inventor and manufacturer have found customers. Nothing in business is more mutually beneficial than judicious advertising. Like charity, it benefits both the giver and the receiver. A trade journal without them would not be worth having, hence some journals insert them almost gratuitously, so as to get a start—a scheme the Clay-Worker has never had to resort to, thanks to the advertisers, who know a good thing when they have tested it. In all our fourteen years we have hardly had a single instance of complaint that advertising does not pay. We have abundant proof of the profitableness of advertising by the pluck of those who kept their goods so prominently before the people during the late hard times. They were well rewarded, for they were on hand to catch the first breeze of returning prosperity.

The retrospect of these years cannot fail to recognize our National Brick Manufacturers' Association as a powerful factor, not only in the substantial improvement in the art of brickmaking, but the even higher plane of social life. It brings men of congenial spirits and common interests into touch with one another, and improves morals and manners as well as methods; and we are sure no one will deny that this institution is a child of the Clay-Worker—not of the editor alone, but the paper has furnished the channel through which earnest men have been heard in its behalf, as well as furnishing also full reports of its doings.

This review of the past is not to congratulate the editor and proprietors of the Clay-Worker, but the Clay-Worker itself, which is not the mere magazine itself that visits you monthly, but which consists in that invisible, intangible essence which binds publishers, editor and readers into one common brotherhood, with a common purpose—and that is, the common good of all. Shall we fourteen years hence mark as great improvements as these fourteen have witnessed? Why not?

In renewing his subscription, Mr. H. Spaan, Keokuk, Iowa, writes that he has succeeded to the proprietorship of the brick works formerly owned by H. & C. J. Spaan. He says the past season has been a fairly good one, there having been a good demand for brick at living prices, and the prospects for next year are still better.

A WORD ABOUT THE WOMEN.

The views of the Clay-Worker on the woman question are well known. They, the women, are important in their proper places, hence they should both take and keep their places on all occasions. One of the proper places for them is at the brickmakers' convention. We believe in woman's rights—the rights which we men are bound to respect, or have trouble. There is no reason why they may not work in a brickyard as well as in an office or ride a wheel if they want to, and they will if they want to, but they are sure not to want to, yet they do want to get away from the humdrum of domestic life once in a while, and our State and national conventions afford both convenient and profitable occasions. It will not only be a pleasure and a benefit to them, but their pleasure will both please and profit the convention.

Bring your wife with you, if you are fortunate enough to have one you are proud of. Perhaps it would be better to say to our women readers, for women read the Clay-Worker, see that your husband goes and then see that you go along, not that you can not trust him to go without you, for he is the best man in the world when away from home, but because you have earned a vacation as well as he. The trouble is not to get his consent for you to go along, but to consent to go without you. Possibly he may belong to that belated class who do not wish to go with or without the wife. If so, the more need of practicing those wifely measures which never fail to bring a recalcitrant husband to terms.

THE CONVENTION SEASON.

Now that "the frost is on the punkin and the fodder's in the shock," it behooves us to review the work of the past season and make plans for the one to come. Brick and tile manufacturers can help one another very much if they will meet and compare notes and experiences. This can best be done at the annual conventions. The first of the season is that of the Illinois convention, held at Decatur Wednesday and Thursday, January 5th and 6th, to be followed by other State conventions. The importance to brickmakers of these annual gatherings can not be overestimated, as experience has fully demonstrated, and they should not only be kept up where they have been organized, but they should be organized where they have not been. It does not necessarily require "a crowded house" to make a good convention, but it does require earnest men—men who are willing to impart information and just as willing to receive it. The man who knows it all is not the most desirable member of a convention. He becomes dogmatical and often talks too much and can not brook contradiction on any branch of the business. "Swift to hear and slow to speak," not so slow as never to speak, is a good rule for any convention. Have something to say and say it, then let somebody else have his say while you listen attentively and respectfully. A convention is no place to parade eloquence, even if we have a stock of it in store. Shoot that off at your next spring's primaries and when the canvass of next fall begins to become interesting. What we want at a convention is plain facts bearing upon the making of brick, and especially about selling them at good, round prices, not at "cut rates." There is likely to be demand enough next year for all the brick we can make, and if prices are not remunerative it will be largely owing to the brickmakers themselves.

But "talking in meeting" is not the only place to do effective and profitable business of a convention. Talking at your hotel in groups or in couples is both delightful and profitable. Acquaintances are thus formed that are abiding and add much to the sunny side of life, as well as being promotive of the cold relations of business, and this feature alone is worth all the cost of a convention to men who live on the higher plane. Of course, some see nothing in anything but the dollar, and very

little do they care, in the last analysis, whether it be paper, silver or gold, so they can get a great many of them for little work and buy a great deal of some other man's labor by parting with a very few of them. There are such brickmakers, but they never attend the convention, and what is more, they seldom read the Clay-Worker unless some good-hearted brother lends them a number occasionally, and then they read moodily, inwardly saying, they don't believe in book learning much anyhow: meaning that they would a little rather temper their clay in a pit by driving oxen around it, as their grandfathers did, than to use present methods, if they could keep up with the procession as well that way. It would be an act of charity, if not a profitable business venture in the long run, to take up a collection to get such men to a live convention once in a while.

These hints are intended primarily to apply to local or State conventions, but they are equally applicable to the national convention, which meets this year at Pittsburg on the 15th, 16th, 17th and 18th of February, 1898. It will be an interesting gathering of brains and business, not without its social features, all of which are largely dependent upon the preparatory proceedings of the local conventions. Go to the latter and you will all the more appreciate the national convention. It will pay every clayworker who can to attend both, and, too, pay well mentally, physically and financially. Remember, "all work and no play makes Jack a dull boy."

ORGANIZATION.

Ofttimes one preaches a sermon so often that it becomes tiresome. This is true of the one under the above text. Particularly is work of this kind tiresome when it seems that nothing direct is being accomplished. However, we think we see a little light in the horizon, and are disposed to take courage and go on in the work of urging local and district organization looking to restraints in competition. In the past our ideas on this subject have not been received with favor by some of our readers. Of course, the personal element in business makes it vastly more interesting than where one is in any way constrained by outside alliances. It is true that every man likes to be master of his own business. However, no man is in business simply to be its master. As soon as we remove the question of profit we remove all fascination which comes from doing business. This thought should not be lost sight of for a minute. Organization, pooling or other restraints of competition have always come through necessity. Certainly the conditions of the present time with respect to profit in brickmaking demand organization. A great many plants have been running without profit. The only incentive which many have found in doing business has been the hope of better things. But hope does not pay interest or buy supplies. There must be an end to everything of this kind. And now that the conditions are what they are, we feel that all should give this question of organization serious attention. The brickmaking industry is not difficult to organize locally, and it is getting less so all the time. The number of plants is not increasing relative to the growth of the country and the increase in population. Furthermore, the equipment of a modern brickmaking plant involves larger expenditure than in earlier times. The brick-making industry is easier to organize on that account. When brickmaking was a mere roadside industry, and when the work was nearly all done by hand, competition was difficult of restraint. A kiln could be located any place where there was clay, bricks made, and the market broken within a short time. It is true that brick can be made cheaper than in earlier times, but the price has declined out of all proportion to the cost of production. This fact must not be neglected. It is our judgment that the next Convention should give more serious attention to this subject than ever was given before. The knowledge of the clayworker's art has progressed to that point that the technique need not monopolize the time of the Convention.

There comes a time in the history of all kinds of manufacturing business where there are periods of repose from technical considerations, and where the business must have the same care and same attention that was formerly given to the science. We assume that the brickmaker's art is approaching that condition.

A BRAVE START.

As we go to press, word comes from Martinsville, Ind., to the effect that the new plant of the Adams Brick Company made its initial run on the 17th. At the word from Mr. Adams steam was turned on, and presto! clay became brick at the rate of 40,000 a day. Everything moved off without a hitch, much to the delight of all concerned. The plant consists of a Potts stock brick machine, disintegrator, mold sander, Standard dry kiln and up-draft kilns. Later on a dry press, now on the ground, will add its quota to the daily output. Mr. Adams is justly very proud of the plant, which he considers a thoroughly up-to-date tempered clay brick works.

TWO PAPERS FOR THE PRICE OF ONE.

The two best papers published in the English language for brick and tilemakers are the Clay-Worker and the Drainage Journal. We have made clubbing arrangements which enable us to offer both papers for 1898 for \$2, the price of one. If you want the best information obtainable in all matters pertaining to the brick and tile business, you can't afford to be without either of these representative magazines. They are the best of their class. Address all orders to T. A. Randall & Co. Indianapolis, Ind.

STATE CONVENTIONS.

The Illinois Clayworkers' Association meets January 5th and 6th at Decatur. Programme on page 447.

The Iowa Brick and Tile Manufacturers' Association will meet January 12th and 13th at Des Moines. Secretary C. L. Smith, North English, Iowa, can give full particulars.

The Nebraska Brick, Tile and Drainage Association will meet January 25th and 26th in the Builders' and Traders' Exchange, Omaha. Secretary, W. H. Bushell, David City, Neb.

NEW ADVERTISEMENTS.

	Page.
Chambers Bros. Co., Brick Machinery.....	420
St. Louis Pulverizer Co., Clay Pulverizers.....	421
Schoellhorn-Albrecht Machine Co., Clay Crushers.....	421
Fernholtz Brick Press Co., Brick Presses.....	426
Standard Dry Kiln Co., Brick Dryers.....	428
Horton Mfg. Co., Brick Machinery.....	464
The Wellington Machine Co., Brick Machinery.....	467
The American Clayworking Machinery Co., Clayworking Machinery	469, 495, 501
Wallace Mfg. Co., Clayworking machinery.....	471
Chicago Brick Machinery Co., Clayworking Machinery....	475
H. Haigh, Continuous Kilns.....	476
Carlin's Sons, Thos., Dry Pans, etc.....	477
Murray & Welch, Roofing Tile Machinery.....	477
Elder & Dunlap, Clay Screens.....	478
Louis H. Reppell, Brick Kiln.....	486
Steele, J. C. & Son, Brick and Tile Machinery.....	487
Taplin, Rice & Co., Clayworking Machinery.....	489
Ohio Ceramic and Engineering Co., Brick Presses.....	491
The Williams Patent C. and P. Co., Clay Crushers and Pulverizers	492
The Anderson F. and M. Works, Brick and Tile Machinery	493
Woolley Foundry and Machine Works, Clayworking Machinery	497
Brewer, H. & Co., Brick and Tile Machinery.....	499
The Eastern Machinery Co., Brick Machinery.....	502

Written for the CLAY-WORKER.

HIS NAME WAS MUD.

By H. Clay Clincher.

I.

His name was Mud.
His mother said 'twas George Adolphus Alfred;
A brainler son was never reared,
Nor one more cherlishingly endeared.
Great days would come when he a man
Enclosed the world within his span.
A man he was. What means that thud?
His name was Mud.

II.

His name was Mud.
The Doctor said, "a wonder sure is my son Fred;
You wait till he grows up and see
The giant man he's bound to be."
The father saw the years go by
And watched his son with tearful eye—
A man he saw him, but—Ah, Gud!
His name was Mud.

III.

His name was Mud.
His schoolmates said: "That Doctor's son called Alfred
Is bound to be the President,
For can't you see that's just his bent?
He has it in his thoughtful eye,
You read it in that studious sigh,
Let's wait, he's got it in his blood."
They're waiting, for his name was Mud.

IV.

His name was Mud.
With bulging head that promising and bright boy Fred
Discovered how he could grow rich
Without the faint remotest hitch.
He bought a clay bank on the sly
And went to making bricks. But my!
He spent his cash and then—Oh, Lud!
His name is Mud.

SWEET ALICE—NEW VERSION.

Brickyard meter.

I.

Do you remember sweet Alice, Ben Bolt,
Who cooked in the brickyard out of town,
Who wept with delight when you couldn't eat a bite
And who trembled in fear lest you could?
In the old churchyard in the valley, Ben Bolt,
In a pathway unmarked by a stone,
We dug there a grave big and wide enough to keep
And Cook Alice within it was thrown.

II.

Oh, do you remember the grub, Ben Bolt,
That oft through real hunger we have ate?
Through the many years of life of that brickyard's hungry
strife
In whatever scenes I never can forget.
O'er that old cook's grave grows the moss, Ben Bolt,
For the rootlets of the grasslet has run dry;
For the only thing that could live upon her, Ben,
Comprises just the moss and you and I.

III.

Do you remember the mill, Ben Bolt,
Near the green shady slope of the hill,
Where together we strayed with our hunger unallayed
And wondered if she really meant to kill?
Oh, the old mill is gone to decay, Ben Bolt,
And the little rippling brook is gone dry.
But though every thought in my mind surely will
My memory of sweet Alice can not die.

IV.

Do you remiember the day, Ben Bolt,
When she made you a pudding on the sly?
She didn't mean no harm, for she really meant to charm,
But the dog who ate the rind did surely die.
Many changes have come in my life since then,
But the memory of that year I can't forget;
And if they are acting bad in Hades, Ben Bolt,
Be sure Alice dear is cooking yet.

TABLE OF CONTENTS.

The Heart of Pittsburg	429	Building Operations Still Boom-	
Modern American Front Brick	435	ing	458
A Pioneer Brickmaker.....	437	A Familiar Ring.....	458
Button-Hole Talks	438	A Good Year—Commends the	
A Great Sewer Pipe Manufac-		Rattler Test.....	458
tory.....	438	Corn as Fuel.....	459
The Development of Hollow		The Situation in Chicago.....	466
Block Manufacture.....	440	The New York Market.....	468
Practical Experience Burning		Good Prospects in Pennsylvania	470
Common Brick	442	Among St. Louis Brickmakers.	470
Paving Brick for Country Roads	443	Busy and Hopeful	470
Don't Worry	444	Pacific Coast News	474
Experiences in Alaska.....	445		
From the Ashes.....	447	EDITORIAL:	
A \$1,900 Horse in the Clay Busi-		Current Comment.....	460
ness	447	Christmas Greetings.....	460
The Decatur Convention.....	447	A Happy New Year	460
By the Light of the Kiln Fire..	448	Close of Volume XXVIII—A	
Decatur the "Central City" of		Retrospect.....	460
the Central State	449	A Word About the Women....	461
Potter's Grit.....	452	The Convention Season.....	461
German Notes.....	454	Organization	462
Official Announcement.....	455	A Brave Start'.....	462
The Ceramic Association of the		Two Papers for the Price of one	462
Ohio State University.....	455	State Conventions.....	462
Will Haul Brick by Electricity.	455	Editorial Notes and Clippings..	472
CORRESPONDENCE:		MISCELLANEOUS:	
Laying of Paying Brick.....	456	New Advertisements.....	462
Is the Gas Engine Suitable for		His Name was Mud.....	463
Brickyard Purposes.....	456	Sweet Alice.....	463
Come to Decatur.....	456	A New Dress	466
A Year of Disaster for the Low-		Seeing is Believing	466
er Mississippi	456	Another "Combine".....	466
Looking After Home Markets—		New Sewer Pipe Machinery ...	466
Reply to Hydro-Carbon.....	457	A Very Busy Man	466
Can Drain Tile be Substituted		Or any Other Town.....	470
for Iron Pipes?.....	457		

Index to Advertisements on Next Page.

Books for...

Brickmakers.

"CLAY GLAZES AND ENAMELS,"	
Henry R. Griffen, C. E.	\$ 5.00
"BRICKMAKER'S MANUAL,"	
Morrison and Reep,	3.00
"BRICKMAKING AND BURNING,"	
J. W. Crary, Sr.,	2.50
"TABLE OF ANALYSES OF CLAYS,"	
Alfred Crossley,	1.00
"VITRIFIED PAVING BRICK,"	
H. A. Wheeler, E. M.,	1.00
"PRACTICAL FARM DRAINAGE,"	
J. J. W. Billingsley,	1.00

Mailed, postage free, on receipt of price.

T. A. RANDALL & CO.,

Indianapolis, Ind.

WANTED—A competent burner, used to burning Pavers made of Shale Rock in round down-draft kilns. None but strictly first-class need apply. Address YORK, care Clay-Worker.

FOR SALE—At a very low price one Penfield Stock Brick Machine, pug mill, crusher and elevator, for sand molded brick, with shafting, pulleys and belts, all as good as new. Address J. W. W., care Clay-Worker.

FOR SALE—A half interest in a well equipped steam brickyard. Capacity 20,000 a day. In a prosperous district and near the liveliest town in northern Michigan. Address BRICKYARD, 121 d 432 South Jefferson Ave., Saginaw, East Side, Mich.

INDEX TO ADVERTISERS.

Brick Machinery—Dry Press Process.

Name.	Page.	Name.	Page.
Progress Press Brick and Machine Co.....	473	The Chisholm, Boyd & White Co.....	424
Ross-Keller Brick Machine Co..	427	The American Clay-Working Machinery Co.....	469, 495, 501
Simpson Brick Press Co	425	The Fernholtz Brick Press Co..	426

Brick and Tile Machinery.

Anderson Foundry and Mach. Works.....	493	Co.....	422
Baird and Son, H. C.....	483	St. Louis Pulverizer Co	422
Brewer, H. & Co	499	Steele, J. C., & Son.....	487
Carlin's Sons, Thomas	477	Taplin Rice & Co	489
Central Machine Works	481	The American Clay-Working Machinery Co.....	469, 495, 501
Chambers Brothers Co	421, 494	The Horton Mfg Co	464
Chicago Brick Machinery Co..	475	The Eastern Machinery Co....	502
Eagle Iron Works.....	481	The Henry Martin Brick Mach. Mfg. Co	493
Freese, E. M. & Co	500	The Leader Mfg. Co.....	494
Frost Engine Co	496	The Ohio Ceramic Engineering Co	491
Hensley, J. W	481	The Wallace Mfg. Co.....	471, 503
Kells & Sons	483	The Wellington Machine Co ..	467
Means & Co., Jas.....	480	Williams Patent Crusher and Pulverizer Co	492
Madden & Co.....	485	Wiles Co., A. M. & W. H	487
Murray & Welch	477	Woolley Foundry and Machine Works	497
Newell Universal Mill Co	492		
Potts & Co., C. & A.....	498		
Raymond & Co., C. W	465		
Stedman's Machine Works.....	487		
Schoellhorn-Albrecht Machine			

Brick Kilns and Dryers.

Alsip, S. H	486	Reppell, L. H	486
Cummer & Son Co., The F. D....	473	Sharer, Geo. W.....	490
Eudaly, W. A	488	Swift, F. E.....	481
Haigh, H.....	476	The American Blower Co.....	480
Hundt & Co., F	479	The Fernholtz Brick Press Co..	426
Morrison & Co., R. B	488	The Standard Dry Kiln Co.....	428
Pike, E. M.....	479	Wolff Dryer Co.....	504
Phillips, S. G.....	483	Yates, Alfred.....	478

Brick Yard Supplies.

Arnold, D. J. C.....	491	Phillips & McLaren	478
Coldewe & Co., G.....	484	The Atlas Bolt & Screw Co.....	489
Carnell, Geo.....	486	The Harrington & King Performing Co	423
Cox, Geo. S.....	479	The Henry Martin Brick Machine Mfg. Co	493
Caldwell & Son Co., H. W.....	480	The Horton Mfg. Co.....	464
Carmichael, T. W.....	482	The Pittsburg Mineral Screen Company.....	479
Elder & Dunlap.....	478	Wagoner, M. V. B.....	482
Marion Steam Shovel Co.....	490	Walworth Run Foundry Co....	480
Mey, F. H. C.....	479		
Merison & Co., W. B	423		
Newton, A. H.....	484		

Miscellaneous.

Associated Trade & Industrial Press	482	Lake Erie & Western.....	482
Baird & Co., Henry Carey.....	479	Main Belting Co	482
Big Four R. R.....	485	Monon Route.....	483
Cincinnati, Hamilton & Dayton R. R	485	Osborne, W. R.....	480
Chesapeake & Ohio R. R.....	484	Pennsylvania Lines.....	483
Cotton Belt Route.....	482	Ropkey-Mason Engraving Co..	478
Dean Bros. Steam Pump Works	481	Tennille, A. F.....	482
Dover Fire Brick Co.....	482	The E. W. Vanduzen Co	484
Evans & Howard	477	The Union Hardware Co.....	484
Gabriel & Sehall.....	478	The Jeffrey Manufacturing Co..	485
Geysbeek, S.....	476	The Rockwood Mfg. Co	484
International Correspondence Schools	485	The Sheldon Distillery Co	485
Indiana, Decatur & Western ...	485	Vandalia Line	484
Illinois Central R. R	484	Westbrook & Wells.....	480
		Small Ads., Wanted, For Sale, etc.	

Mention the Clay-Worker

WHEN WRITING TO ADVERTISERS

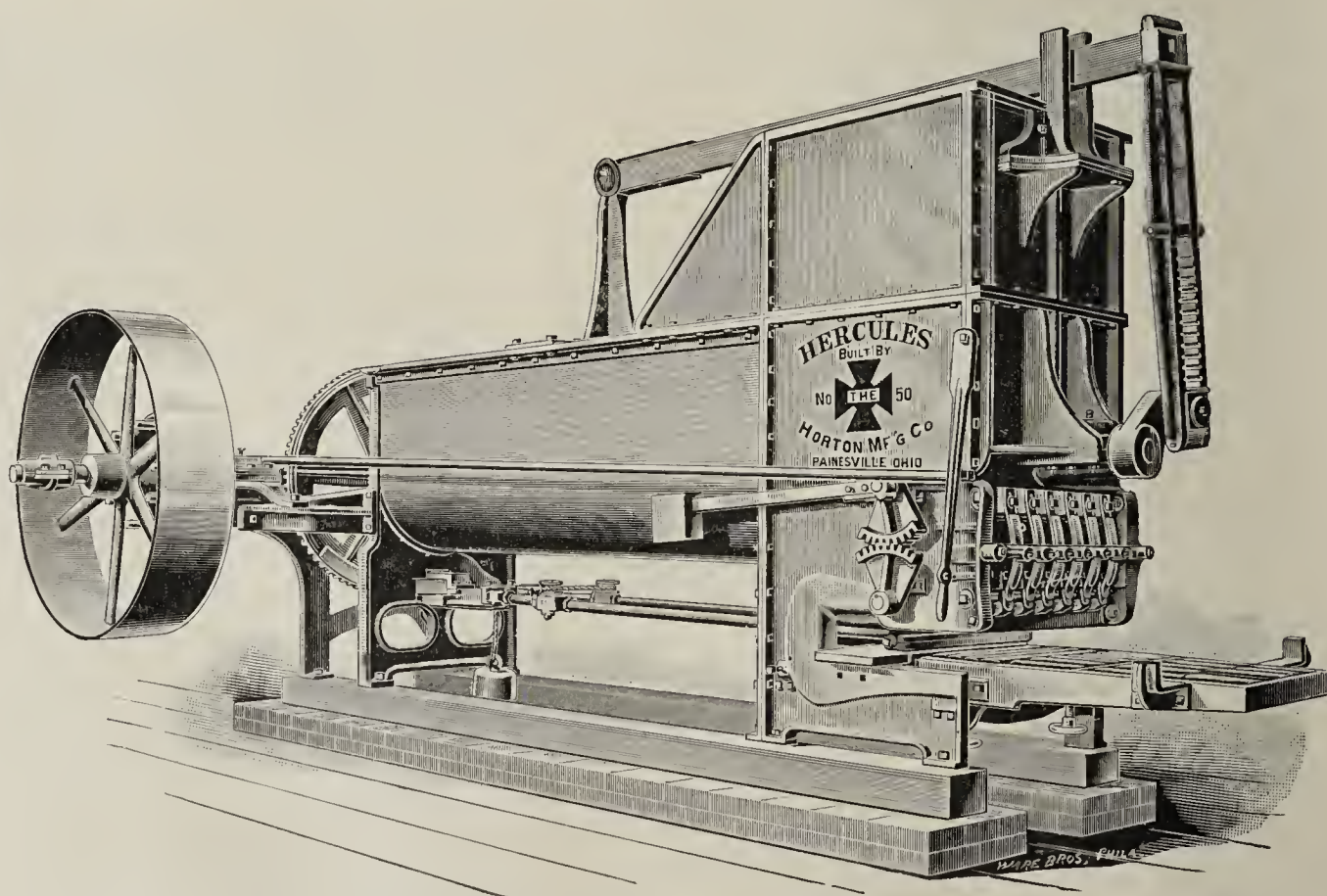
Mention the Clay-Worker

HERCULES.

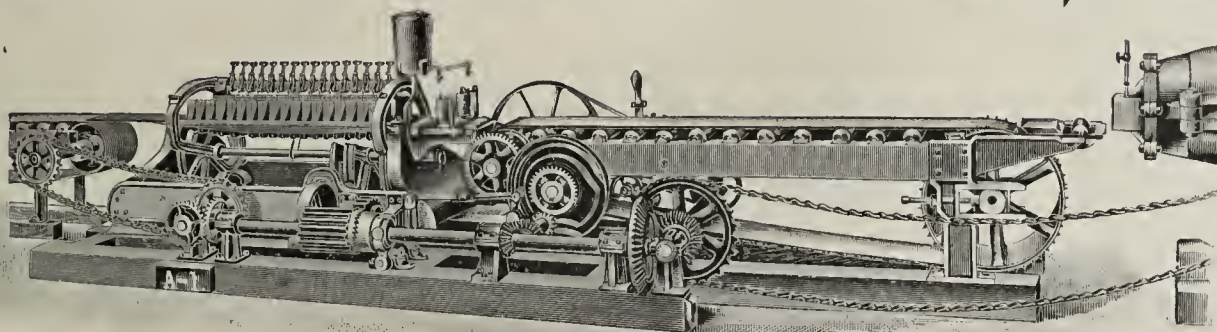
The Acme of Simplicity.

A Giant in Strength. Pug Mill and Machine combined. An Upright press that never wears. Guaranteed to make 5,000 brick per hour.

The Horton Mfg. Co.,
Painesville, Ohio.

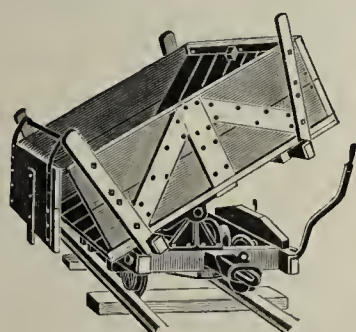


Yes Sir-ree! We Make 'em all, We do!

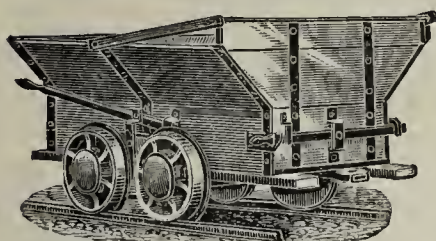


Automatic Side Cutting Table.

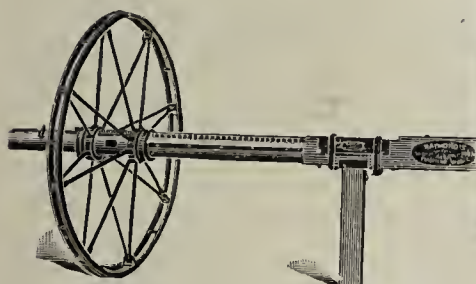
An' we make a whole lot more besides,



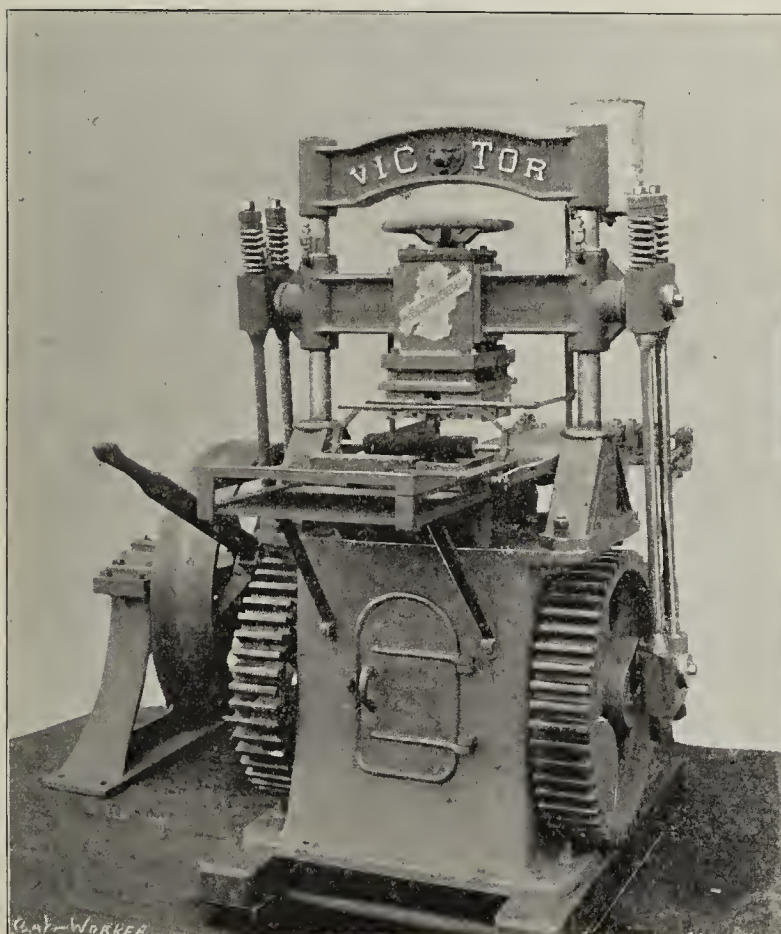
Automatic Dumping Car.



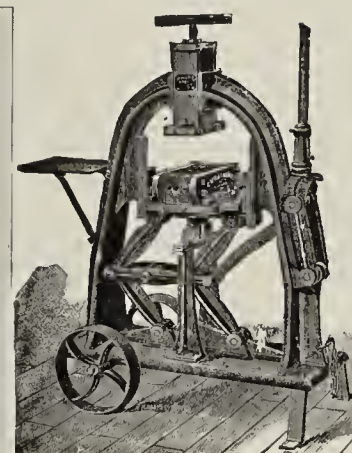
Bottom Dumping Car.



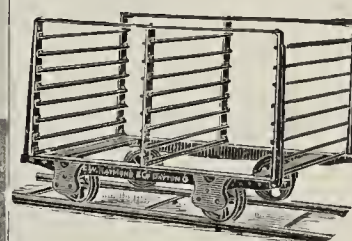
Wrought Iron Tempering Wheel.



The Raymond "Victor" Repress.

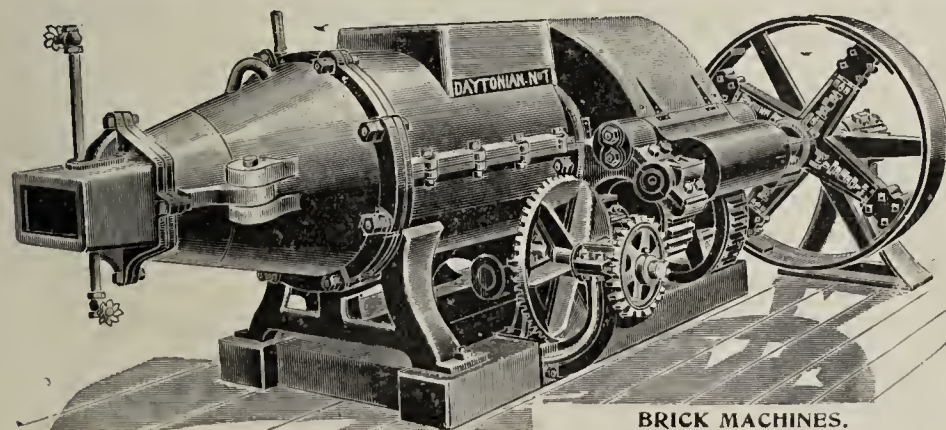


Perfection Brick Press.



Dryer Cars.

Ef you don't believe it just send for our catalogue.



BRICK MACHINES.

We Sell 'em too like hot cakes.

...

**C. W. Raymond
& Company,**

Dayton, Ohio.

THE SITUATION IN CHICAGO.

THE FALL BUILDING season just closed, as seen by comparison with the spring and summer months, is almost a boom. By reference to my July letter, I find that in that month the outlook for the building interests began to look more hopeful at that time, and each succeeding month has been an improvement over the one preceding it, and November has exceeded the expectations of the most sanguine and in some portions of the city there has been almost a boom. This is especially true of the South Side district. In this district all of the territory convenient to the South Side Elevated Railroad has witnessed such an increase in new structures that one is reminded as he rides along on this line of the season that preceded the World's Fair, when so many buildings sprang into being, by magic, as it were. The completion of the elevated loop has brought all of the elevated roads into the very heart of the down-town district, and as the result the travel by these lines has been increased many fold and is still increasing. It has also had the effect of bringing the World's Fair district and much intervening property into the rapid-transit district, and the enterprise of builders and investors has not been slow in taking advantage of the opportunity thus offered to increase and improve their holdings.

What is true of the South Side is equally true of the vast territory reached by the Metropolitan lines on the West and Southwest sides. Every indication points to a renewal of these activities in the building line in the spring.

There has been an unusually large number of apartment houses begun on the South Side below Fortieth street. Between thirty and forty of these structures, ranging in price from \$10,000 to upwards of \$100,000, have been commenced within the last five weeks. These buildings were planned some time ago, but the actual work was postponed until the loop was completed. They represent the expenditure of thousands of dollars and will cover many vacant lots in that section.

Improvement of transportation is always followed by building operations, and this section has not been an exception to the rule.

The bank clearings of Chicago for November reached the enormous aggregate of \$458,000,000, which is a gain of \$100,700,000 over the month of November, 1896.

The financial editor of a daily paper states that bank clearings are an absolutely reliable barometer of general business conditions. That a steady and permanent increase in bank clearings from week to week means a positive commercial and industrial revival is as certain as the law of gravitation.

The bank clearings of Chicago for the month of November tell a tale of good times that must completely confound the calamity howlers. There are no arguments that can be advanced by the apostles of discontent that will prevail against figures which show only business transactions.

During the recent local political campaign in Chicago the politicians who were very active during that time still claimed that the hard times still continued and that there had been no improvement. This clique was led by our ex-Governor (I don't like to write his name), who was the leader of the howlers. Statements of politicians are apt to be unreliable, but bank figures can be trusted.

A new corporation has come into existence in Chicago during the last few weeks styled "The Cook County Brick Company." The stockholders are manufacturers of brick in Cook county. Under the by-laws of the company each brick manufacturer is required to pay \$1.50 to the company for each thousand brick sold by him. The seller may sell at any price he may choose to name. The price of brick has not been materially advanced over prices which obtained before the new company was organized. Of course, the tendency will be to reduce the output of the various yards to the requirements of the trade.

As stated in one of my former letters, the brick manufacturers in Cook county are capable of making at least three times as many brick as can be used here in any year, taking the best year Chicago ever had in building as a basis.

Builders are now selling at \$6 delivered. This is certainly not a high price for hard-burned builders when the fact is considered that they have to be shipped into the city by rail and then be hauled on wagons to the building sites.

Building statistics for November show that permits were taken for the construction of 432 buildings, extending over a frontage of 10,557 feet, involving an expenditure of \$2,250,600, being a decrease in the number of buildings from the preceding month of 116, a decrease in feet frontage of 1,544 and an increase in cost of \$707,030. Compared with the corresponding

month of last year the figures show an increase of 68 in the number of buildings, 1,123 in feet frontage and \$570,580 in cost. Compared with the same month in 1895, there is a falling off this year of 109 in the number of buildings, 2,638 in feet frontage and an increase in cost of \$464,030. The figures in detail are as follows:

	No. of bldgs.	No. of ft. frontage.	Cost.
South division.....	171	4,051	\$1,306,000
North division.....	96	2,437	412,400
Northwestern division.....	73	1,843	174,500
Southwestern division.....	92	2,226	357,700
Total	432	10,557	\$2,250,600
November, 1896.....	364	9,434	\$1,680,020
Increase this year.....	68	1,123	570,580
November, 1895.....	541	13,195	1,786,570

TEMPERED CLAY.

Chicago, December 11, 1897.

A NEW DRESS.

A new photo of the Fernholtz Brick Press appears on page 426. It gives a better view of this great press than the cut previously used. However, the press must be seen in operation to be fully appreciated. Like good men, it is known by its work, not mere looks.

SEEING IS BELIEVING.

"Look at the map," say the agents of the Pennsylvania Lines, and you will see that that great system offers the most direct route to the Pittsburg Convention from all points East and West. Our readers may see this for themselves if they will turn to page iv of the index in this number and "Look at the map."

ANOTHER "COMBINE."

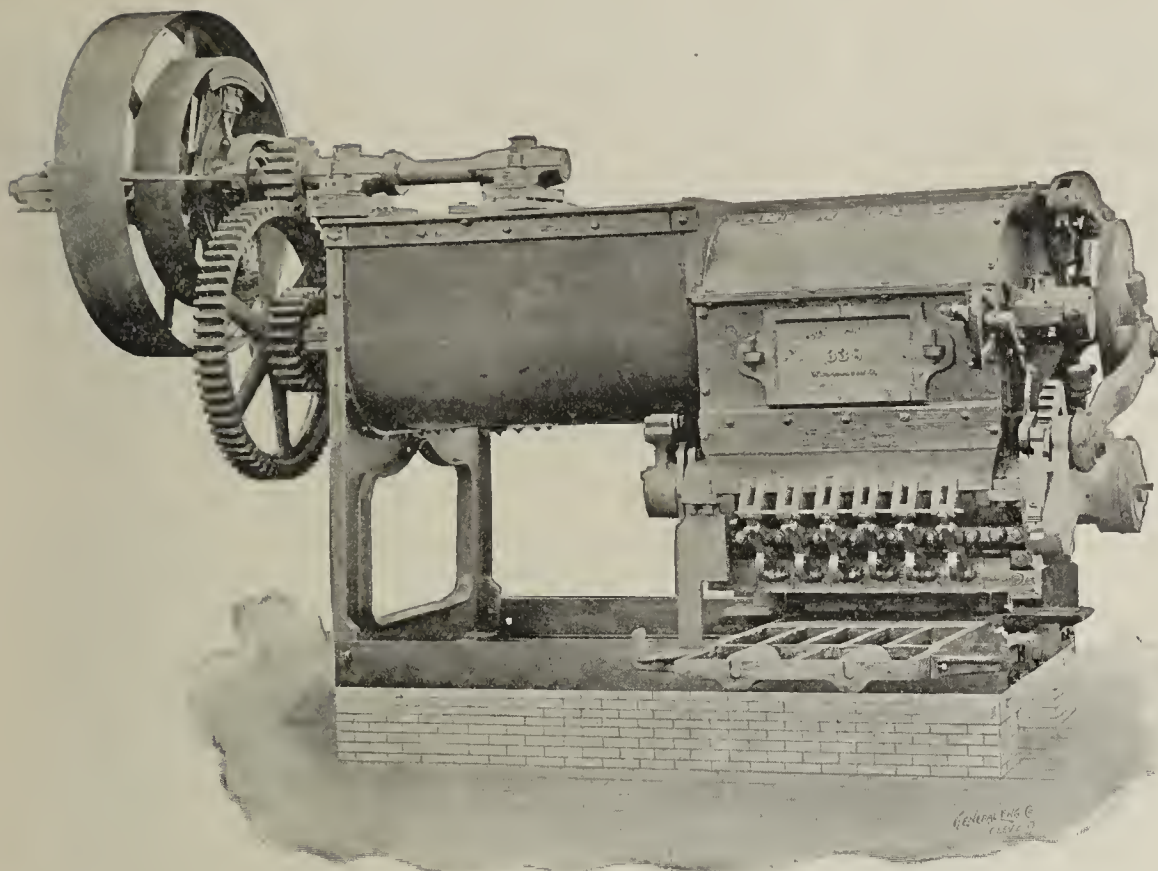
The American Clayworking Machinery Company invite special attention to the new combined augur machine and pug mill, a cut of which appears in their ad. on page 469. It is a very effective combination, they say—one that brick and tile manufacturers will find a sure enough money-maker. Write them for full particulars.

NEW SEWER PIPE MACHINERY.

We welcome back to our advertising pages, after a long absence, the well-known firm of Taplin, Rice & Co., Akron, Ohio, in whose ad. on page 489 will be found a cut of a new sewer pipe press and equipment of novel design, which they think is far superior to anything offered the trade heretofore. They will be pleased to give full details of this outfit to any of our readers who may be interested. They also manufacture a large line of clay crushers and potters' machinery.

A VERY BUSY MAN—W. J. WOOLLEY ADDS TWO BRICK YARDS TO HIS TAX LIST.

We were pleased to have a social chat with W. J. Woolley, proprietor of the Woolley Foundry and Machine Works, Anderson, Ind., early in the month. Mr. Woolley stopped in our city long enough to sell a machine and say "howdy." He is a very busy man, having added to the care of a large machine shop and foundry two brick plants—the Shadeland Brick Works and the North Anderson Brick Works, both well-equipped plants near Anderson, having a daily capacity of 60,000 building brick. He intends to run both factories right along. A goodly portion of the output for the time will be used in an extensive addition to his machine works, his trade in that line having outgrown his present factory. In addition to these extensive business operations of his own, Mr. Woolley finds time to look after the interest of his home city as a member of the Common Council, watching closely every important detail. A local paper comments on his phenomenal success as follows: "The rise of the Woolley Foundry and Machine Works from a small workshop to one of the largest establishments in the State has taken a remarkably short time, but it has been brought about by the untiring energy and persistent courage of its owner. Anderson is proud of the establishment and full of admiration for the enterprise of Mr. Woolley."



A Thorough Investigation

of our Machines is earnestly invited. . . .

They Are

Exactly what we claim for them.

The "Monarch"

Horizontal; with Double Pug Mill and Double Presses, and other valuable features contained in no other.

The "Iron Quaker"

Upright; simplest, best and lowest priced of any real competitor.

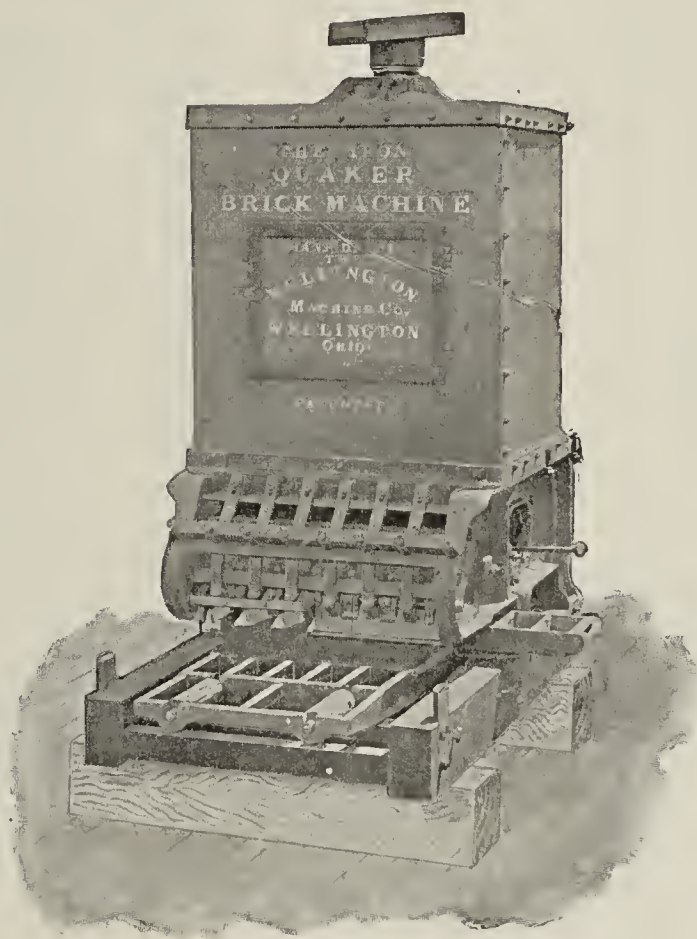
These two machines are unquestionably the leaders of the "sand-moulding" class.

AUXILLIARY MACHINES AND SUPPLIES

Pug-Mills, Disintegrators, Crushers, Mould-Sanders, Represses, Winding Drums, Dump Cars, etc., Moulds, Dump Tables, Dryer Cars, Kiln Doors and Castings, Elevators, Dump Carts, etc., etc.

Ball-Bearing Brick Barrows and Trucks.

No one else makes them.



FOR SALE.

Odd sizes of moulds. Have not been used.
5 moulds, $8\frac{1}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
20 moulds, $8\frac{1}{4} \times 13-16 \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 in. partitions.
17 hand moulds (3's) standard size.
Second-hand, but used a few days only.
10 moulds, $9\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{3}{4}$. $\frac{1}{2}$ inch partitions.
19 moulds, $9\frac{1}{2} \times 4\frac{1}{4} \times 2\frac{3}{4}$. " "
16 moulds $9\frac{1}{4} \times 4\frac{1}{4} \times 2\frac{3}{4}$. 9-16 inch partitions.
16 moulds $9 \times 4\frac{1}{4} \times 2\frac{1}{2}$. 9-16 inch partitions.
10 moulds, standard size.

The Wellington
Machine Co.,
WELLINGTON,
OHIO.

Send
for
Circular.

Written for the CLAY-WORKER.
THE NEW YORK MARKET.



WHAT A CHANGE in six short weeks in the brick industry in this section, and I see by the last number of the Clay-Worker in other sections of the country as well, in regard to the price of brick. It does not seem possible when in conversation with the manufacturers that they are the same men who but a short time ago said that the trade was dead beyond any help, that it was simply overdone and they could not see any help in sight. They were "bearish" in their talk. Not that there was any money to be made by it, but a loss. They had been waiting patiently from season to season for a break that never came, so that they had come to believe that there was nothing but a hard struggle in sight, then loss of all they possessed. Talk to the same men now and you would think they had never lost faith in the trade; in fact, they are not like the same persons—all because brick have "riz" in price. Now talk is all of the "bullish" order—the price is going up, up. A few days ago I heard one manufacturer offer to bet that he would get \$6 per M for a large barge load in the New York market before the close of navigation. It is to be hoped that he may realize that figure. If so, there will be an advance of 75 cents per M on each thousand above the present rate and from \$1.50 to \$1.75 above the rate he was receiving a year ago. "I tell you," he says, "brick will be high next spring and I do not care if I don't ship any more." All the same, he is anxious for the return of his barge so that he can ship two or three more cargoes this fall.

Where does all this great confidence rest? The market is not an active one or entirely in the hands of the seller. The buyer is a factor that has the card up his sleeve. As a convalescent patient requires careful nursing to insure full recovery, just so with the market; if free shipments are indulged in the market feels it at once. It is by holding back the brick that the price is sustained by the agents, as the majority of the manufacturers are after the commission man to get his boat out. When only seventy barges coming on the market a week, or say about 18,000,000 brick, will cause a drop in price, it certainly shows that the buyer is not covering any shortage in stock. He may take off the market what he needs from day to day.

The choice brands are not so much in demand as the common, or cheap, brick—even pale as well as light hard are in demand.

The brickmaker no doubt was truly thankful this Thanksgiving. He will spend a merry Christmas as the result of being able to have more money in his pocket. Whether the happy results which many look for in the trade in the new year will become a fact time will tell.

—One Factor—

To which the trade looks forward to as a safety valve, so to speak, to sustain the price, is the prospect that the long-talked of rapid transit will be a fact. As it is now in the hands of the courts for settlement and a decision must most likely be rendered within a week, as well as the contracts to build must be signed before the first of the year. It will be but a short time to wait for the realization of the help to come to the trade from that enterprise. The bridge over the East river will also be begun this winter, as well as the resumption of the work on the tunnel under the Hudson river and talk of another to cross the East river. One would say the prospects are bright for the trade. Some are very confident that it will be a money-making year. A year hence will tell.

—Straws—

Indicate which way the wind blows, is often quoted. The straws of the trade, and but seldom seen, are the trucks, wheelbarrows and carts which are being taken to the wheelwright and blacksmith shop to be put in order, and they are very much in need of overhauling, but to have it done in the fall is a very unusual event. It goes to show that they must expect to return to better prices to meet the expense. They have put off repairs until on some yards the shafting fell down as a result of making things run when it was plain to be seen that the services of a mechanic were needed.

—A Sample—

Of the methods of some to make things go was strikingly brought out the past summer on two yards. The belt that connects the machine with the shafting gave out. As one can go to New York City from any of the yards in three-quarters of an hour or, say go and return with the purchase in two hours, and the cost of the belt would not be many dollars, it

would be expected that that course would be taken. No; a belt was borrowed from a yard that was not running for the rest of the season. How is that? In another case one of the small wheels which are connected with the tempering rigging overhead broke. The parties went to the same yard and borrowed a wheel. Any one who has had anything to do with taking that part of the wheel connection apart knows that it is no easy job, and to borrow, as in this case, till the "next day," as they had sent to Haverstraw for one, was only adding extra expense. Well, the wheel was used during the season and has not been returned up to the present time. The same parties sent the cartman to another yard for coal dust in the afternoon and he drew two carts when one of the proprietors saw him and wanted to know what he was doing. He replied that he was sent. No application had been made for the dust—just helped themselves. It has been the practice all summer to borrow wood and molding sand till patience ceased to be a virtue and a halt was called. It goes to show that if low prices should return it would be rough sledding in some cases.

—The Cost of Building—

At present is comparatively low, and we would say with money looking for investment now is the time to take hold of unimproved realty and so catch the flood tide of the higher rates which must follow. As fire-proof in all structures is the great object to be obtained, to quote those who are interested in that line, say that with lumber on the free list, the gradual reduction in the cost of steel beams, tiles, brick and other non-combustible materials, has been sufficient to make the cost of a fire-proof building hardly more than 10 per cent. greater than one of non-fire-proof construction. As recent experience has shown that a modern fire-proof building can be put up in about two-thirds the time required to construct one of the old-fashioned type, why not a boom. To quote the words of a leading architect on reduced cost and the general conditions: "The dullness of the building industry is evidenced by the extraordinary cheapness of certain essential materials, as shown by estimates received on contract work." Red brick, for example, can be put in the wall for \$11 per M, the price of labor remaining the same as before; steel beams can be erected for \$37.50 a ton, against \$45 and \$47 four years ago, and steel office buildings can be constructed for 25 cents per cubic foot, as against 33 cents." Judging from his own practice, he concluded that the period of stagnation is nearing its end on this basis that quite a number of manufacturing chemists are making preparations to enlarge their works, and the demand for sulphuric acid may be regarded as a pretty accurate industrial barometer.

As shown, the cost of building is low and no marked increase, that is to say, any great activity in the material trade from the rule of low prices has made its appearance, there must be some cause. The continual trouble among the unions has been one serious drawback. As a sample, how is this. The Cornice and Skylight Maker's Union have entered into an agreement with the Sheet and Plate Glass Glaziers' Union that on and after December 9th it will not handle glass cut by non-union men. Notice to this effect was sent yesterday to all contractors, builders and architects. How is this: "Any member of our organization who is informed by the delegate or any other person that the glass he is working on is non-union shall at once cease working on that glass without further instructions. Any member found guilty of the violating of this order shall be fined \$10 for the first offense." The irresponsible information on which they are to quit work, "from delegate or other parties," is another illustration of the inconsiderate and arbitrary policy of labor organizations. The past year has been one of continued unrest in the labor unions in New York City and to them can be laid much of the cause of increased cost—material falling in price, labor always wanting more money.

—A Time to Retire—

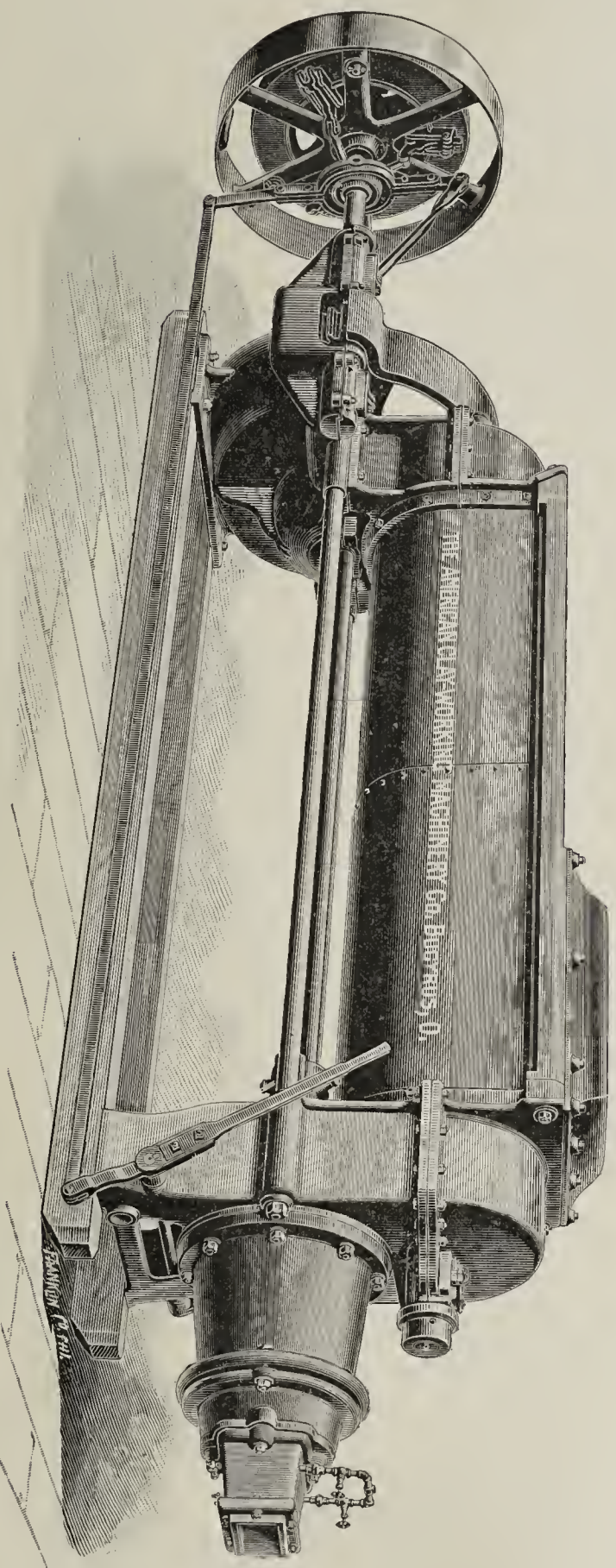
Not to sleep, nor when one has made money enough, but from work on the brickyard. The man who started on the yard as a boy will pass through all the grades of work before he can take charge of a yard. The army and navy, as well as the police force, have an age limit, when they must give up active work. On the brickyards, after years of active work, the long-handled shovel screening sand in the bank is the last work for him who has passed through all the stages from boy to old age. At what time of life will the foreman produce his best results in burning brick for there is where the success or failure lays in the business. The young man who has his first charge will give it his best attention. For years he may have the same second hand with him, when kiln after kiln will be the same. For some cause he changes to another second hand, one who has not worked on the yard with him at all. The first and possibly the second kiln may not be as well burned out as in other seasons. It is because of the change. The

[CONTINUED ON PAGE 470.]

New Combined Machine....

THE Combined Auger Machine and Pug Mill is the latest candidate for public favor put on the market by The American Clay-Working Machinery Co., of Bucyrus, Ohio, a cut of which is here given.

The Combined Machine occupies the least possible space, is complete, ready for installation and but one belt and pulley is needed. This machine is adapted for making all kinds and sizes of tile, up to 18-inch. It is also well adapted for the manufacture of hollow ware and both end and side cut brick. The Pug mill shell is made of best steel plate 24-inch diameter and 8 feet long, its shaft is of forged steel and fitted with adjustable knives which can be removed at pleasure. The clay is carried forward by these knives and is discharged



into the auger case through a feed opening. The auger case is made of best material. The shaft being constructed of forged steel is extra strong and durable. All bearings are of proper length, are carefully fitted and provided with suitable oil boxes, they are all protected and none are in the mud. A strong point of advantage is the neatly encased gearing which is of the most substantial proportions. The machine is fitted with the celebrated Imperial Friction clutch pulley 42x8-inch, which places the machine under the immediate control of the operator. Height 4 feet 10 inches; length 17 feet 10 inches. Speed 150 revolutions per minute. Weight 10,230 pounds. Power required 30 to 40 horse. Capacity 2,500 to 3,000 brick per hour or its equivalent on tile. It will afford us pleasure to answer any questions you may wish to ask about this or any other of our clayworking machinery.

The American Clay-Working Machinery Co.,

See Ads on Pages 495 and 501.

—BUCYRUS, OHIO, U. S. A.

THE NEW YORK MARKET—Continued.

boss will speak to the foreman and he may be able to explain the cause, and if not he will call the second's attention to it and possibly closer attention on his part may be noticeable in the next burn.

After years of service the foreman is not as active as when he first took charge of the kilns; he requires more sleep. When a man burns from twelve to fifteen million brick each brickmaking season with wood he loses a great deal of rest. But his work turns out good—shows that the hand and mind have not forgotten the earlier lessons. The time comes when he changes to another yard and the kilns do not run as good as usual. The boss is not satisfied. The result is he is discharged—he is too old. Is it time for him to retire? This is not a case of supposition, but an actual fact which occurred on one of the Hudson river yards the past summer. A better man in charge of a yard could not be found—true, sober, and what is scarcely ever seen on a yard to-day, an American; and to that the cause can be traced. It is not the first time in his case. Under-hand work was used against him. Some years ago he was foreman for Wood & Keenan, of Haerstraw, and was making good burns, except that the heads seemed from some cause to be light. The "cause" was an Irish second hand was working against him. In the present case the heads were the point of attack. Another man was in to burn, and his kiln was light heads, and still at this one probably knew all about the "cause," and did not dare try any tricks with him, and his work was all right. It seems that the Irish must and will rule.

—A Waker—

Has never been used on a yard as yet, but it would probably in many cases pay the boss to hire a man, to be called a waker. In business it would be to wake up those who fall asleep and the kiln at night and see that there was no neglect of the kiln by sleeping. On one of the yards, from some cause, one of the bosses thought that something was wrong around the kiln. He went to the yard after midnight quietly, and from a point where he could see what was going on without being seen himself, he discovered that the one who should be awake and looking after the kiln was sleeping, and by his watch the man enjoyed three-quarters of an hour good sleep, and would have continued sleeping had not one of the men called him for instructions. Does that not look as though a "waker" would pay?

—The Market—

Is one that will allow the manufacturer to ship to the New York market and do better than he can at the home market, and when the cargo is discharged he will get his money, while the home trade is very uncertain; in many cases it will take a year to get the money, and in others—never. The yards are shipping freely, and some are loading extra boats. If the good weather continues till the holidays there will be a large reduction in the stock here. We have a weather prophet in our town, of which your readers have no doubt heard—Andrew Jackson DeVoe. He says that the Hackensack river will be frozen over on December 2d. But whether it will stay frozen he does not say. It is not on the strength of his prediction that the manufacturers are shipping on outside boats, but they want some of the dollars to use. The comparison of prices of this date, November 30, 1895, and last year the first of the year, or when shipping was about over, is encouraging:

	1895.	1896.	1897.
Pale	\$1.50@2.00	\$2.00	\$3.00@3.25
New Jersey.....	4.25@4.62½	4.12½@4.37½	5.00@5.25
N. R.	4.50@5.25	4.25 @4.75	5.00@5.50

May the next month show from 50 to 75 cents per thousand advance and last till new brick, and at no time next summer drop below the five-dollar mark, is to be hoped for.

A. N. OLDTIMER.

GOOD PROSPECTS IN PENNSYLVANIA.

Publishers Clay-Worker:

You will find enclosed check for \$2 for the next year's subscription to the Clay-Worker.

I am not a brickmaker, but a bricklayer. Have built a number of kilns in different parts of the country, and am interested in the making of brick and look forward each month to the coming of the Clay-Worker. Business is very good with me, especially for this time of the year, and indications point to much more building in the spring. D. G. MCGEAR.

The first calendar for '98 comes from the Alton (Ill.) Paving, Building and Fire Brick Company. It is a handsome hanger, the chief feature being a lovely, golden-haired, pink-robed summer girl. With such a pretty face to look at, we fear many will fall to see the name of the donor.

AMONG ST. LOUIS BRICKMAKERS.

The coal strike situation in this locality has not improved any and it is only with the greatest difficulty that the smaller brick plants can keep on manufacturing and burning, while the large yards have to hold kilns over owing to the lack of coal.

The Saunders Press Brick Company have been very successful in placing their goods, so much that they have been compelled to work overtime.

McEwing & Thomas, representing the Thomas Press Brick Company, of Thomas Landing, on the Mississippi river, are holding their own in fine shape and are thinking of erecting a brick-enamelling works on north end of the city limits.

Among the good things that fell to the Hydraulic Press Brick Company is the contract for a large commercial building which will take millions of brick.

On the old Steinkamper plant the last kiln of brick has been burned and it has been decided to dismantle the plant.

The Tower Grove Press Brick Company are operating both their common-kiln and the patent-kiln plants.

The Gaffney Vitrified Brick Company are getting everything in shape and will be heard from in the spring.

The Brockschmidt Press Brick Company are filling all their kilns, so that they will be in good shape to handle their part of the trade.

The Progress Press Brick Company are running two machines to their full capacity and are making preparations to enter into the vitrified paving-brick business, as they have a fine bed of shale underneath their red clay.

The Union Press Brick Company had to lay off their burning gangs and were forced to hold water-smoked kilns over, owing to the scarcity of fuel.

The Illinois Supply and Construction Company are getting their share of high-grade business and report the Collinsville Hydraulic Brick Plant running steady.

The Cote-Brilliant Press Brick Company are now working up the last of their red clay and are making exhaustive tests of shale clay with a view to enter the vitrified paving-brick business.

There is a rumor afloat that some Kansas City people are desirous of locating a new brick plant here and are now prospecting (on the quiet) for a suitable site.

The Blow Brick Works have succeeded in obtaining a United States Government contract for some buildings at the Jefferson Barracks. It keeps their new Fernholtz machines going at full speed to turn out the millions of brick it will take to furnish the order.

There seems to be an antipathy on the part of the city officials to the use of vitrified brick for sewer-building purposes, as they claim that the vitrified brick will not bond well in the arches. With all the old concerns and the new ones entering into the vitrified-brick line, there will be music in the air and some tall hustling will have to be done to keep the plants going.

"ARTISAN."

BUSY AND HOPEFUL.

Editor Clay-Worker:

We enclose herewith draft for \$2, same being our subscription for the coming year, and are most happy to continue your valuable publication.

We are pleased to say that we are truly thankful that we are still in the stoneware business, and although we had a very bad fire early in the year, we are now on our feet again, with increased capacity and shipping fully three cars of Bristol ware per day. The outlook for next year is very gratifying and from present indications we are going to have all we can possibly do.

Wishing you the best of success, we are

Yours respectfully,

MONMOUTH POTTERY COMPANY.

Monmouth, Ill., Nov. 24, 1897.

OR ANY OTHER TOWN.

Good brick paving, well laid, is good enough for Meadville, and councils should not add to the burdens which property owners have voluntarily taken upon themselves by ordering pavements which are needlessly expensive. Block asphalt has been fairly satisfactory for the few years it has been down on the very wide streets in the residence portions of Washington, but it is not enough better than brick to warrant any increase in the cost, and it is an open question yet if it is as good as brick. Get good brick and have them well laid—that's all we need ask or can afford to pay for in Meadville.—Meadville (Pa.) Journal.

BRICK MACHINERY

Wonder No. 4.

Capacity, 60,000 to 100,000 per day.

Big Wonder.

Capacity, 50,000 to 60,000 per day.

Intermediate Wonder.

Capacity, 25,000 to 40,000 per day.

Little Wonder.

Capacity, 20,000 to 25,000 per day.

BRICK CUTTERS

Cunningham's Side Cut Automatic Cutter.

Cunningham's End Cut 3-Stream Automatic Cutter.

Cunningham's End Cut 2-Stream Automatic Cutter.

Cunningham's End Cut 1-Stream Automatic Cutter.

Side Cut Broad Delivery Table.

Hand Brick Cutting Table.

Combination Side and End Cut Hand Brick Cutter.

PUG MILLS

No. 3, Plain Closed Top Pug Mill.

No. 3, Open Top Pug Mill with Wallace Patent Cleaner Teeth.

Tempers clay for 75,000 to 100,000 brick per day.

No. 2, Open Top Pug Mill.

No. 2, Closed Top Pug Mill.

Tempers clay for 35,000 to 50,000 brick per day.

No. 1, Open Top Pug Mill.

No. 1, Closed Top Pug Mill.

Tempers clay for 25,000 to 35,000 brick per day.

No. 1, Wallace Patent Pug Mill.

No. 2, Wallace Patent Pug Mill.

Tempers clay for 20,000 to 40,000 brick per day.

DRAIN TILE MACHINERY

Little Wonder Makes 3 to 12 inch.

Capacity, 8,000 to 12,000 4-inch daily; others in proportion.

Intermediate Wonder Makes from 3 to 18 inch.

Capacity, 10,000 to 15,000 4-inch daily; others in proportion.

Drain Tile Cutting Tables for large and small tile Trucks for Handling Large Tile.

Reversing Device for large tile.

CLAY PREPARING MACHINERY

Dry and Wet Pans, 6, 8 and 9 feet, with wood and iron frames.

Clay Screens.

Clay Crushers and Stone Separators of many designs and capacities to suit conditions.

Clay Elevators all lengths and widths to suit your desire.

Dry Clay Bucket Elevators of length and breadth to suit desires.

Friction Hoisting Drums.

Friction Geared Hoisting Drums.

Clay Cars. Truck Wheels and Axles.

Kiln Doors and Frames.

Kiln Doors without Frames.

Wheelbarrows for Brick and Tile.

Brick Pallet Spring Trucks.

Engines. Boilers. Pumps.

Shafting, Pulleys, Hangers, Couplings, Journal Bearings and Belting, both Rubber and Leather.

A Long Argument



IS NOT NECESSARY TO CONVINCE PRACTICAL BRICK-MAKERS OF THE MERITS OF OUR MACHINEERY. OUR SUCCESSSES PROVE THAT.

A Case in Point

Is that of the Burnham plant in Milwaukee which we were reported to have made a failure. Under date of October 26th, '97, Mr. John F. Burnham writes:

“You guaranteed the **Big Wonder** to make 50 M brick per day; as a rule we have been able to better that amount by several thousand, and running under favorable circumstances have made as many as 80,000 a day, and you know our clay is very difficult to work. In fact some have said it could not be worked successfully by the stiff clay process—but the **Wonder Machine** is doing it.”

Mr. Burnham's equipment including Granulator, Compound 4-Roll Crusher, Pug Mill, Big Wonder Machine and Cunningham's Automatic Cutter was all furnished by us, and is entirely satisfactory.

Need we say more?

If you want anything in the line of clayworking machinery. Don't fail to get our prices.

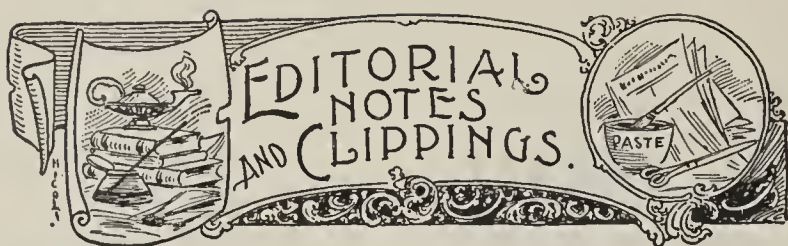
Wallace Mfg. Co.

Frankfort, Indiana.

CHICAGO AGENTS:

CHICAGO BRICK MACHINERY CO., Chicago, Ill.

See Ad. on Page 503.



J. S. Todd has purchased the Reeder Tile Factory at Kenney, Ill.

L. A. Mitchell, Ventura, Cal., writes us that he wants to purchase brick machinery.

Robert Bryant, of Dixon, Tenn., contemplates establishing a brick plant at Cadiz, Ky.

The Owens Brick Works at North Adams, Mass., have been purchased by E. A. Rand & Son.

Albert Pratt has purchased the interest of Mr. Wilson in the Earlville (Ill.) Brick and Tile Company.

Theo. W. Graham, Mt. Morris, Livingston county, N. Y., is looking for a good site to locate a brick plant.

Correctionville, Iowa, wants a brickyard. Information concerning same can be had by addressing Mayor Adams.

A slight damage was caused at the Strobach, Faber & Co. yards, Chaska, Minn., by the burning of the kiln sheds.

H. L. Cary and E. D. Moore, both of Bolivar, Polk county, Mo., advise us that they desire to purchase brick machinery.

Our correspondent at Millington, Ill., writes brick business in that section is very good and the prospects are bright for next year.

Charles Walsh, a brick manufacturer of Hackensack, N. J., has increased his facilities by purchasing the Cooper brick-yards near him.

F. E. Swift, Burlington, Iowa, writes that he is having fine success with his kiln furnace and says all he has sold are giving good satisfaction.

David Cassidy, engineer of the Shale Brick Works, Wooster, Ohio, was caught in the cogs of the machinery and crushed to death November 30th.

The large tile factory at Gibson City, Ill., owned by S. N. Felton, was burned to the ground early in November. The loss was very nearly covered by insurance.

Russell O. Bouser, of Rockville, Ind., has purchased the plant of the Terre Haute (Ind.) Mosaic Tile Company and will remodel same and manufacture clay shingles.

The Omaha (Nebr.) Brick Company has been incorporated by Mark Hansen, John L. Neble and Henry, John L. and E. W. Livesey. The capital stock is placed at \$50,000.

R. B. Morrison, Rome, Ga., in a recent letter, says he has recently been re-elected Mayor of his town after a "red-hot" fight. He also reports a good trade for November.

The Hydraulic Press Brick Company, St. Louis, Mo., have recently taken a number of large orders for enameled brick that will keep them busy in that department for some time.

The principal fire loss at Victoria, B. C., for the month of November was that of the brickyard of Elford & Smith, the damage being estimated at \$3,500, with insurance of \$2,800.

The brick and tile factory of Armentrout & Childers at Newmarket, near Crawfordsville, Ind., was completely destroyed by fire December 5th. Origin of the fire is unknown.

John Stipes, who is now at the head of the Sheldon Brick Company, Champaign, Ill., has purchased the plant of the Urbana Brick Company and will in the future operate both plants.

Anyone desiring to invest in brickyard property will do well to investigate that advertised by "Abroad" in our "For Sale" columns. The gentleman assures us that this is a rare bargain.

A recent contract taken by the Catskill (N. Y.) Shale Brick Company calls for 6,000,000 paving brick. Over 2,000,000 have been delivered, another million will be delivered this fall and the balance next season.

The main building of the plant of the Galesburg (Ill.) Stone-ware Company was burned to the ground on the 2d instant at a loss of \$25,000, which is partially covered by insurance. The origin of the fire is unknown. The office of the company was in the main building and added to the other loss is that of some valuable papers. The stock room containing the largest

portion of the fine ware was not damaged in the least, so that they will be able to fill some of their orders. The plant will probably be rebuilt at once.

S. Judson Stark, Tunkhannock, Tenn., writes that the tests he has had made of the clays in that section have proven very satisfactory and that in the near future a company will be organized to work same.

Peter Costello, said to have been the first brick manufacturer in the Ohio Valley, died at East Liverpool, Ohio, November 23d, in his eighty-third year. He made brick and tile in East Liverpool in the early forties.

The Brink Brick and Tile Factory at New London, Iowa, was completely burned to the ground November 29th. The loss is about \$3,000, on which there is no insurance. Mr. Brink has not decided whether he will rebuild.

Martin Daveleer & Son have purchased a tract of land near Milwaukee, Wis., where it is their intention to open up a new brickyard, where they will manufacture press brick. It is said the grade of clay is of a superior quality.

The New Jersey Stone Brick Company is the name of a new firm at Mays Landing, N. J., which has erected a plant for producing brick in eight hours. The brick will be made from sand. E. C. Brice is at the head of the concern.

J. J. Amas writes that the Humboldt (Kan.) Brick Manufacturing Company is a newly organized concern and will manufacture brick of all kind—dry pressed, common building and vitrified paving brick, fire brick and drain tile.

George T. Dickover, Wilkesbarre, Pa., vice-president of the National Brick Manufacturers' Association, reports business as quiet, but he is taking advantage of the slack time to build another twelve-arch kiln with Eudaly's patent steam blower.

The Brockway Brick Company at Fishkill-on-Hudson, N. Y., of which the worthy vice-president of the National Brick Manufacturers' Association is the head, has purchased a tract of clay land comprising eighty-seven acres at Plum Point, N. Y.

Welsh, Gloninger & Co., Allegheny, Pa., have received an order for 1,500,000 fire brick to be used in a coke oven. The order calls mostly for special shapes, to be used in the pipes, etc., and will keep the plant at Monaco busy until midwinter.

M. E. Jansen, who is now operating a brickyard at Stotesbury, Mo., has been prospecting around Port Arthur, Tex., and Nederland, Colo., with a view of establishing a new brick plant. He pronounces the clay near Nederland a good quality.

The Chicago, Indianapolis & Louisville Railway (Monon Route) are now members of the Mileage Ticket Bureau, and all interchangeable books, with or without the name of the Monon on them, are good on all C., H. & D. and Chicago, Indianapolis & Louisville trains.

B. S. Waltz, Lawrenceburg, Tenn., in remitting for the Clay-Worker, says he is now manufacturing brick by hand, but would like information in regard to manufacturing either by horse-power or steam-power machinery with a view of purchasing something of the sort.

R. M. Matson Sons & Co., Falls Creek, Pa., will enlarge their brick plant this winter and in addition to common building brick will turn out paving brick, drain tile and a high-grade face brick. Their output the past season was 6,000,000, nearly all of which has been disposed of.

The Manhattan Brick and Terra Cotta Company, of New York City, has been incorporated with a capital stock of \$50,000. The directors are: Robert H. Mathews, of 112 East One Hundred and Fourth street; Andrew W. Mathews, of New York City, and Charles F. Halstead, of Brooklyn.

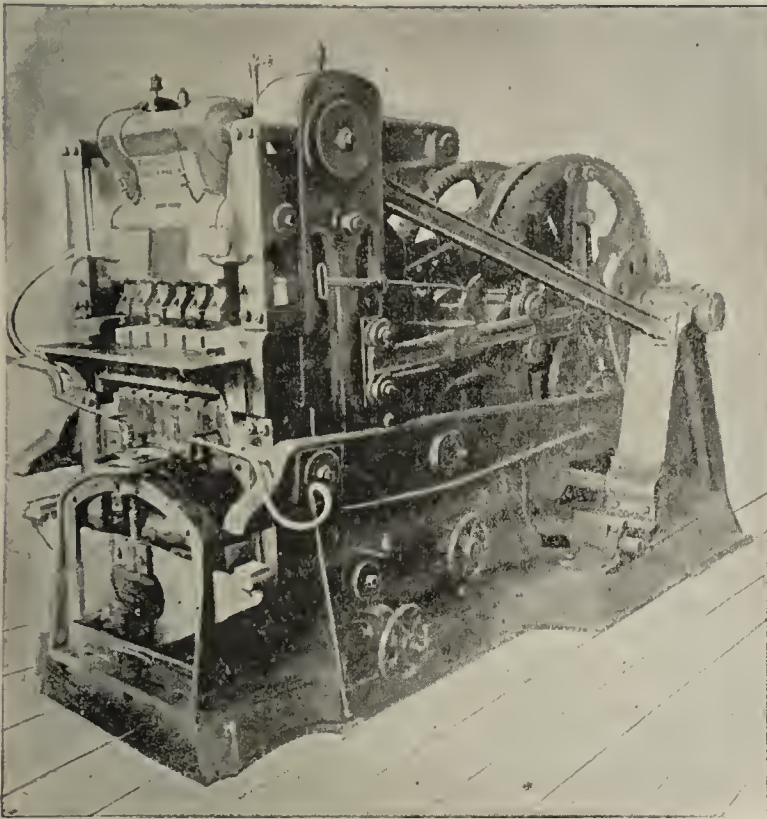
Rumor has it that a wealthy New York syndicate is being formed for the purpose of purchasing all the brickyards along the Hudson River. J. E. Munger, of Fishkill, states that surveys are now being made along the river front on both sides with the view of carrying out the proposed scheme.

D. O. Loy, Atkinson, Ill., generally known as the poet laureate of the Illinois Clayworkers' Association, is making arrangements to light his brick and tile plant with electricity. If he meets with success with this venture he will probably undertake the lighting of the town. Success to him.

C. A. Stewart, Exeter, N. H., sends in \$2 for the Clay-Worker and advises us that he would be pleased to receive catalogues of clayworking machinery suitable for the manufacture of building tile and fancy brick. He is organizing a stock company to begin manufacturing in the spring and would like to hear of desirable locations in the South and West. He closes his letter by saying: "I desire to sell State

[CONTINUED ON PAGE 474.]

The PROGRESS BRICK PRESS.



THIS PRESS is the strongest and simplest in the market, it is adapted for manufacture of all kinds of brick, plain and ornamental. We have manufactured over 270 different shapes on this press, which stock can be seen at our yards.

Come and see our system of employing the waste heat to dry and water-smoke the green brick.

Complete equipments of modern Brick Plants is our specialty.

DESCRIPTIVE CATALOGUE
ON APPLICATION.

Progress Press Brick and Machine Co.,

King's Highway and Oak Hill R. R.

ST. LOUIS, MO.



Read What

H. C. Carroll & Sons. of Philadelphia, have to say about the **Cummer Direct Heat Dryer** which replaced a steam dryer.

OFFICE, 60TH AND HAVERFORD STS.

TELEPHONE 147, W. P.

**H. C. CARROLL & SONS,
Brick Manufacturers,**

Residence, 3831 Lancaster Avenue.

3 YARDS: { 57TH AND WYALUSING AVENUE.
58TH AND HAVERFORD STREETS.
60TH AND HAVERFORD STREETS.

Philadelphia, April 19, 1897.

The F. D. CUMMER & SON CO., Cleveland, Ohio.

Gents:--It gives us great pleasure to say that your dryer is doing splendid work for us, and it is drying 35,000 bricks per day, and would dry a great many more if required.

We think it the best dryer in the country.

Yours respectfully,
H. C. CARROLL & SONS.

IF your dryer is giving you any trouble, or if it is too expensive to dry your bricks, you had better "Tell your troubles to"

The F. D. CUMMER & SON CO., Cleveland, Ohio.

EDITORIAL NOTES AND CLIPPINGS.—Continued.

rights for manufacturing my building tile outside of New England. I do not fear the outlook, as I can build houses cheaper than they can be built of wood."

In a recent letter H. L. Boas, of the Montello Clay and Brick Company, Reading, Pa., says: "We are very busy and have been the entire season in our brick business, principally on vitrified paving brick, having some time ago sold all the brick we could possibly manufacture during the year."

I. C. Fuller, senior member of the firm of Fuller & Grant, brick manufacturers of Dexter, Mo., died at his home in that city November 19th. Mr. Fuller had hardly reached the prime of life, being only thirty-seven years old, but even at that age had done much for the improvement of Dexter and its business interests and will be sadly missed by the community.

Sir Henry Doulton, head of the firm of Doulton & Co. Lambeth potteries, London, is dead. Sir Henry Doulton was born in Vauxhall July 25, 1820. He initiated the manufacture of sanitary pipe making in 1846 and commenced art pottery and Doulton ware in 1870. Sir Henry was a chevalier of the Legion of Honor and received the Albert medal of the Society of Arts.

The death of J. W. Leedy, the well-known brick manufacturer of Harrisburg, Pa., occurred at his home in that city November 12th. He had been manufacturing brick since 1888. Mr. Leedy had been in his usual good health on leaving home for the yard, but was suddenly stricken with heart failure and died within an hour after the first attack. Five children survive him.

According to the Philadelphia Record Umtali, South Africa, is enjoying an old-fashioned American "boom" and only awaits the bricks to erect banks, hotels, stores and residences. Brick machinery has been forwarded from England and a brick and tile factory started at Guelo, but the cry of "brick" resounds on every hand and a fortune awaits those who can first supply the demand.

Early in the morning of December 7th fire broke out in the drying sheds of the Summitville (Ind.) Brick Company and before it could be got under control had completely destroyed the shed with all the pallets and ruined the green brick on them. The loss is \$4,000, on which there was \$1,000 insurance. They will rebuild at once.

A number of Indiana capitalists, headed by Secretary of State Owen, have purchased the old plant of the Garden City Brick Company at Valparaiso and a large tract of land adjoining same. It is their purpose to remodel the old plant and erect additional buildings, where they will manufacture terra cotta. The clay beds in that county have been pronounced by State Geologist Blatchley to be the finest in the State.

C. Herron, an employe of the Kenilworth Brick Works, Wellsville, Ohio, had a narrow escape from death recently. He has charge of the cars at the clay bank. By some mistake he ran a car into the mouth of a shaft instead of into the clay bank and fell with the car to the bottom of the shaft, some sixty feet below. His injuries are quite serious, but hopes of his recovery are entertained. Had he fallen under the car death would have been certain.

W. O. Dakin, secretary of the Toledo (Ohio) Brick Supply Company, advises us that the article going the rounds of the press to the effect that the Brick Supply Company has gone to pieces is a misstatement and asks that we publish the correct state of affairs. Mr. Dakin says: "The company consisted of eleven brickyards and was formed under the laws of the State of Ohio December 10th for the purpose of mutual protection and to reduce expenses. Business has been quite light all summer, but began to improve in September and is still good, considering the weather. On November 12th one yard suddenly withdrew from the company without giving any warning or reason, and gave notice to the public that the company had 'gone to pieces.' Ten of the best and strongest yards are together and intend remaining so, reports to the contrary notwithstanding."

HOLIDAY RATES—1897-98.

All agents of the C. H. and D. Ry. will sell tickets for the holidays at one fare and a third for the round trip to all points on the C. H. and D. and many connecting lines. Tickets may be sold December 24th, 25th and 31st, 1897, and January 1st, 1898, good to return until January 4th, 1898, inclusive.

PACIFIC COAST NEWS.

THE CLAYWORKING FRATERNITY is waiting for something to turn up which may cause a little activity in the trade. As it is now, business is so quiet that there is nothing to report in the way of interesting local news. The year is almost gone, and the dealers are not very sorry when looking back on anything but a busy season. All that can be said is that it is hoped that 1898 will prove more beneficial than the present and past years.

A pottery has been started at Goleta, Cal., by Joseph Sexton. He had been shipping large numbers of flower-pots from Los Angeles for use in his florist business, but the breakage in transportation was heavy, and as there is an abundance of clay in sight at his place at Goleta, he determined to manufacture them himself. The industry has every indication of being a successful enterprise.

E. F. Sommers, Jr., a well-known mining engineer, and for many years employed by the New Jersey Fire Brick and Tile Company, was recently in Butte, Mont. He visited the big fire clay deposits near Red Bluff, and says the quality of the clay is fine. He will investigate the merits of a recently uncovered deposit of fire clay near Big Hole Basin, and there is a possibility of his company undertaking the development of this bed if the conditions warrant.

The United Verde Company have fired their first kiln of brick at Jerome, Ariz. It contains 200,000 brick. They expect to burn 3,000,000, with which they expect to erect a new store and opera house at Jerome.

The factory of the Pacific Clay Manufacturing Company, at Corona, Cal., is undergoing extensive repairs. New and improved machinery is being put in, and in a short time work will be resumed on a larger and more improved plan. The clay is found in large quantities and is of very fine quality.

The new pottery to be established in Stockton, Cal., will soon be in active operation. A number of expert clayworkers have been engaged, and the understanding is that operations will begin about the middle of December. The first work will be on sewer pipe, a lot of which has been contracted for.

S. F. Fuller, of Detroit, Mich., was recently in Riverside, Cal., visiting friends. He has now gone to the City of Mexico, and will establish a sewer pipe manufacturing works there.

Stockton, Cal., has an art pottery industry which has now grown to considerable size. Ten artists, all women, are regularly employed in painting flower designs on vases and other articles. The output of the artists is about one hundred pieces a day of various sizes. The ware is what is known as "Rekston." The clay, instead of being a California product, as one would suppose, all comes from New Jersey.

Proctor & McMullins have closed their brickyards at Balfour, B. C., for the winter. This year they made and disposed of 675,000 brick. Their last sale covered 160,000, which went to the Hall Mines smelter. The plant will be opened again next spring on a more extensive scale.

Articles of incorporation have now been filed for the Enterprise Clay Works, of Ogden, Utah. It is the object of the company to manufacture and sell drain tile, water pipe, brick, etc., and also to sell clay lands. At present the factory is only turning out drain tile, for which there is a good demand, the capacity of the plant being a mile and a half of four-inch tile per day. Within a short time, however, the owners expect to be turning out the other articles mentioned, also tile flooring, paving brick and stoneware of various kinds and patterns, the clay owned by the company being especially adapted for these uses. John S. Smith is the President of the company; Mark Butcher, Vice-President; A. A. Wenger, Secretary and Treasurer. These, together with S. T. Smith and L. J. Butcher, make up the Board of Directors of the company.

Pressed brick, not so very long ago a novelty in Los Angeles, Cal., are rapidly growing in favor in that city, and are now being used for the facing on nearly all the new blocks going up, the Grant Block, at Fourth and Broadway, being about the only exception. The Laughlin office building will be faced with a cream-colored "Roman" brick, making one of the most beautiful fronts in the city, giving a rich and stately effect. It is said that one beneficial result of the increased use of pressed brick for facings will be to discourage the use of the material made of plaster of Paris, etc., which gives a cheap effect, and yet in the long run proves an expensive material. Northern clay, the Carbondale and the red clay procured at Los Angeles is used on the buildings, and also the Alberhill clay, mined near the Alberhill, Cal., coal mines. The deposit of this latter clay is practically inexhaustible.

The brick kiln at the Alcatraz Works, near Gaviota, Cal., is now ready for burning.

SUNSET.

A Word to the Wise is Sufficient.

The Owl is wise enough to listen to what the Little Bird says. He knows the bird flies far and sees much, while he himself sits on a limb winking and blinking.



The Little Bird sings, "Good Times are coming—I've **seen them**—Don't sit there moping—**Get Ready for Them.**"

The Wise Brickmaker also listens to what the Little Bird says, and prepares for good times by overhauling his yard this winter. Then he is ready for the early Spring trade, which he knows is the **Cream of the Business.**

The Little Bird says something else too, if you are wise enough to listen. It says: For all kinds of Machinery—Dry Press—Stiff Mud—or Soft Mud—go to

The Chicago Brick Machinery Co.,
225 DEARBORN STREET.

FOR SALE, WANTED, ETC.

Advertising rates in this Column 25 cents a line, or 4 cents a word, each insertion; about seven words make a line. Cash should accompany the advertisement to insure insertion. No ad. inserted for less than \$1.00.

WANTED—One 50,000 capacity Stiff-mud Brick machine, with Automatic Cutting Table. Also, one over-geared dry pan.
121 c M. LANZ & SONS, Pittsburg, Pa.

BRICK AND FIRE PROOFING—I wish to recommend my foreman to those in want of practical all round man and thoroughly reliable.
121 d] Address, H, care Clay-Worker.

THE TROUBLES you have with your clay, machinery or kilns, can be remedied. Consult the
121 cm TECHNICAL ENGINEER, care Clay-Worker.

FOR SALE.—One Monarch brick machine; one Raymond sander; one Raymond clay crusher; one Conveyor. Address,
11 tf d JESSE T. MORGAN, Wilkes-Barre, Pa.

FOR SALE.—One of the best paying brick and tile factories in Iowa; part pay in good land. Address, PATTON & MUNSON, Lock Box 11,
11 tf dm Lohrville, (Calhoun Co.) Iowa.

FOR SALE AT A BARGAIN.—One 4-mold Boyd dry press brick machine in perfect condition.
THE FERNHOLTZ BRICK PRESS CO.,
8 tf l St. Louis, Mo.

FOR SALE — CHEAP — A Columbia Raymond Power Single Repress, with different dies; as good as new; in first-class running order. Address,
121 cm P. MITTLER, Glen Mary, Tenn.

FOR SALE OR RENT—A good tile factory; only one tile mill within 12 miles; in one of the best counties in the state; good demand for tile. Best of reasons for selling. OS. LILES,
121 cm care Clay-Worker.

WANTED—SITUATION—As foreman of brick-yard or assistant foreman of pottery or terra cotta works by a young man who is energetic and ambitious. Address
121 L THOROUGHLY RELIABLE, care Clay-Worker.

FOR SALE—Hand yard in a live town of 6,000 made owner over \$4,000 this year; racks and pallets only used two seasons; good clay. Price \$2,000; one-third down balance in 1, 2 and 3 years. Must be sold by Jan. 15th. Owner goes to Klondike. Write quick. Address KLONDIKE,
121 l pm care Clay-Worker.

FOR SALE—Brick and tile factory; in operation now; manufactures tile in winter and brick in summer; has not shut down for 12 years, only for repairs; no competition; reasons for selling, patent kiln furnace to sell as per ad. on page 481.
123 L F. E. SWIFT, Washington, Iowa.

WANTED—A gentleman of responsibility and capital, having extensive business relations with the trade in New England and New York, wishes to become interested in the manufacture of fire brick in Central or Western Pennsylvania. Address INVESTOR,
121 cm care Clay-Worker.

FOR SALE—As good as new; most of the machinery of a modern 40,000 capacity plant. Cheap for cash. Including repress and hand presses. It will pay you to examine this machinery before committing yourselves elsewhere. Address, X. Y.
121 dm care Clay-Worker.

WANTED—First-class man for throwing, or one capable of turning up shapes on the wheel, foot power. Address, stating where last employed with references.
121 d GRUEBY FAIENCE CO., 164 Devonshire St., Boston, Mass.

WANTED—Second-hand boiler, engine, tile machine, automatic cut-off table, cars, track, shafting, pulleys, etc. In fact any requirements that go to make up a Tile and Brick Factory. Address with stamp, F. G. SNYDER,
121 cm Jewell Junction, Iowa.

FOR SALE—At your own price; one Penfield & Son Horizontal Stock Brick machine, new never used; one Jonathan Creager & Son Grand Automatic Stock Brick machine used 90 days, good as new; one Adrian brick stiff clay machine; four first-class friction Hoisters; 65 double deck Walworth Run dry cars, new; two side-cutting tables; one 85-H. P. boiler and engine; two small boilers and engines; two 40-inch fans, new; lots of 2 15-16 shafting; big lot of doors and grates; one Raymond Hand repress, new; one mould sanding machine; 50,000 W. P. Pallets, new rack for the same.
CHERRYVALE VITRIFIED BRICK WORKS
123 d Cherryvale, Kan.

Two for the Price of One.

The two best papers published in the English language for BRICK and TILE MAKERS are

The CLAY-WORKER and
The DRAINAGE JOURNAL.

WE have made clubbing arrangements which enable us to offer both papers for 1898 for \$2.00—the price of one. If you want the best information obtainable in all matters pertaining to the Brick and Tile business, you can't afford to be without either of these representative magazines. They are the best of their class. Address all orders to

T. A. RANDALL & CO., Indianapolis, Ind



Haigh's New System of Continuous Kiln



Is still in the lead of all other Continuous Kilns. It will pay you to investigate if you intend building a Kiln. All particulars will be cheerfully given, write to

H. HAIGH, Catskill, N. Y.



S. GEYSBEEK, New Brighton, Pa.

Ceramic Chemist,

SPECIALTIES:—Analyzing clays, bodies, glazes and all Ceramic materials and products. Adjust bodies and glazes on every pottery line. Formulas for bodies and glazes for Pottery, Roofing Tile, Brick and Terra Cotta.

Suggestions and conclusions from analysis and pyrometric tests given free of charge. JUST DROP A LINE, LET ME KNOW YOUR TROUBLES AND I WILL ADVISE YOU.

FIRE BRICK, FIRE CLAY and FIRE CLAY TILES.

Sewer Pipe all Sizes.

We keep a large assortment fire brick and tiles and stock for kiln building and repairs. Floor tile a specialty. Special shapes and sizes made to order on short notice. Our goods have been standard in all markets for forty years. Write for prices.

EVENS & HOWARD,
920 Market Street, - - - ST. LOUIS, MO.

Roofing Tile is Coming....

➔ THE MACHINE TO MAKE
IT HAS ARRIVED.

A simple and very economical way of making Clay Shingles or Roofing Tile is found by using the machinery covered by recent patents granted to A. H. Murray and C. S. Welch. This industry is completely revolutionized by reducing the cost of manufacture to a nominal sum compared with the cost under the crude and expensive methods heretofore in use. This machinery is now ready for the market, and it has been thoroughly tested and is in practical operation to an extent that places it beyond a doubt of its practicability. Only territory east of the Mississippi river open. Correspondence solicited.

For full information address

MURRAY & WELCH, Huntington, W. Va.



VERLASTING Sounds nice but it is hardly a good word to apply to Clay-working Machinery. We need not tell practical Clay-workers that the natural "wear and tear" on all brick-making appliances is so great that unless they are carefully made and of the best material they are short lived and a source of expense and tribulation. We appreciate

this and construct our Clayworking Machinery with a view to great strength and wearing qualities. Our **Dry Pans and Wet Pans** are unequalled for capacity and durability. If you are open to conviction on these points let us refer you to those who can testify from hard experience and know whereof they speak: They say **Carlin's Machinery is the Best made.**

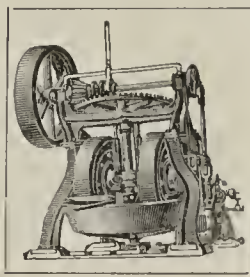
We also make Engines, Clay Cars, Hoisting Machinery, etc.; all extra heavy—as near as may be everlasting.

Don't fail to get our prices.

.....

Thomas Carlin's Sons,

Allegheny, Pa.



NO DRY PRESS BRICK PLANT complete without the Carmichael Clay Steamer.

T. W. CARMICHAEL,
Inventor and Manufacturer,
Clarksburg, W. Va.

6 tf d

FOR SALE.—Paving Brick and Hollow Block Plant containing thirty acres of land deposits of shale clay and coal. Three railroads. For sale at a bargain. Address MINE, 111 dk care Clay-Worker.

FOR SALE.—One 8-ft under-geared iron frame wet pan; one 6-ft iron frame wet pan; one new 5-ft pan for wood frame; one Potts stock brick machine; one Potts sanding machine; one 7-ft horizontal pug mill; two vertical pug mills; large lot of steel and iron pallets; 20 pallet cars; lot of brick barrows, molds, etc. Address THOS. CARLIN'S SONS, Allegheny, Pa.

11 12 c

FOR SALE.—The best equipped Pressed Brick Plant in state of Ohio. Brick have a standard reputation. Finest bed of red and buff clay right at the works. Six down-draft kilns holding 800,000 brick. Daily capacity of presses 30,000. Steam dry house. Kilns have exhaust fan system whereby save about \$2000 per annum in fuel. Best coal \$1.00 per ton delivered at kilns. Cheap labor. Belt line R. R. connects with seven railroads including B. & O. and Pennsylvania system. Largest line of molded dies in the state. Will sell at a great bargain. Correspondence and inspection of plant solicited. Reason for selling, have to move to Colorado on account of health. It will pay you to look this plant over. Address, LOCK BOX 277, Zanesville, Ohio.

11 2 d

A BIG BARGAIN.

For sale cheap—a well-equipped brick plant in Northern Wisconsin; no other plant within 50 miles; clay burns red and there is an abundance of it; good railroad facilities, forty acres of clay land and large amount of timber suitable for fuel. A fine opportunity for a young brickmaker to start for himself. For full particulars, address WALLACE, 7 tf d care Clay-Worker.

FOR SALE.

Machinery and effects of a new complete Fire Brick Plant, consisting of one 14"x16" Centre Crank Engine (F. M. Nagle, Erie, Pa.) with two pulleys, side feed lubricator, etc; one new 80 H. P. "Wangler" 48"x20 ft. 12-6" flues; Smoke stack and Breeching 40' high; one 1½x2¼x4 Duplex Steam Pump (Laidlow-Dunn-Gordon Co.); one 9 ft. Dry Pan, new white oak, 12"x12" frame heavily braced and bolted, in perfect order, new elevators, screens and heavy shaftings, pulleys and all connections, etc. 54 ft. and 48 ft. new 14" 5 ply Giant belting (Revere R. Co.); 53 ft. and 38 ft. new 7" 4" ply belting (N. Y. R. Co.); 5 Hand represses. All the above set up, complete and in perfect working order for preparing clays and never run but a few days. Will be sold very low. F. O. B. Address H. W. DOUGLASS,

12 1 dm 915 Chestnut Street, St. Louis, Mo.

SUPERINTENDENT.

First-class man desires change. Am thoroughly experience in the manufacture of Front brick and Fire brick. Will prove my ability to responsible parties by addressing BRICK, 12 1 c care Clay-Worker.

FOR SALE.

A large Front Brick Plant near eastern market. Modern in all details; large acreage of coal, fire clay and shale. Product: Buff, Gray, Red, etc. Extremely low price. Good paper and time payment accepted. Or will retain half interest with good parties. Reason for selling, owner going abroad. This is a rare chance and must be acted upon at once. Address 12 1 d ABROAD, care Clay-Worker.

ENGLISH PLANS FOR PLASTIC BRICK WORKS.

Complete sets including general plan and elevation of works.

Plans and sections of machine room.

Plans for Dryer heated with waste gas from boiler.

Plans for Dryer heated with exhaust steam and complete working plans of Hoffman kiln.

Prices on application to

BENNETT & SAYER, Derby, England.

FIRE BRICK MANUFACTURERS desiring services of a thorough, practical superintendent will oblige by addressing advertiser, who has had large experience in the management of important works manufacturing first-class fire brick, silica brick, furnace blocks, tiles, etc., also front and paving brick. Advertiser is thoroughly acquainted with all methods of manufacture and machinery connected with the trade. First-class references. Address
101 d SUPERINTENDENT,
Care Clay-Worker.

A VALUABLE CLAY PROPERTY TO BE HAD AT A BARGAIN.

The advertiser offers upon favorable terms a location in northwestern Pennsylvania for making fire, building and vitrified paving brick, flooring, roofing and drain tile, sewer pipe and terra cotta in all its branches, and, in fact, all clay products except pottery. Twelve different kinds of fire clay and shale, in inexhaustible quantities, are on the property, burning white, buff, pink, salmon and red in color. On the property are also from twelve to fifteen million tons of bituminous coal, which can be delivered to works along the railroad for 50 to 60 cents a ton. Shipping facilities are first-class. A set of twelve bricklets, showing color and quality, forwarded on application. One vein six feet thick burns a pure white brick, which does not shrink in burning, adapting it especially for making enameled brick and tile. Address
103 cm "PENNSYLVANIA,"
Care Clay-Worker.

FOR SALE.

3-ton Trenton Iron Co. Incline hoist for conveying clay to machine house.
8-foot Chisholm, Boyd & White dry pan.
1 revolving screen and mixer, ½ screen and bucket elevator, with 20 6-inch buckets.
6 spring brick trucks.
Lot shafting, belting and pulleys.
75-horse-power Westinghouse engine.
1 Barr Pumping Company steam pump.
1 Chambers Bros. Company brick machine.
All new or little used, and in excellent condition. Address
10 tf d WALNUT,
Care Clay-Worker.

GABRIEL & SCHALL

P. O. Box 2654. 205 Pearl Street.

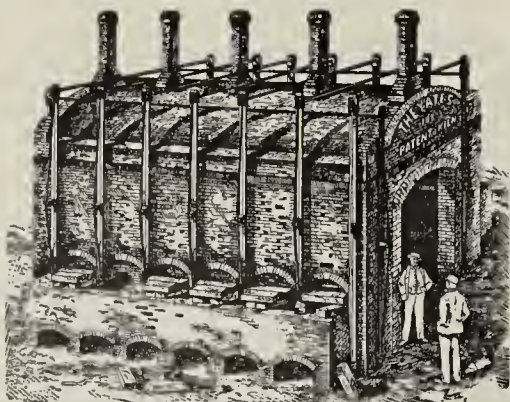
NEW YORK.

Sole Importers in the United States of the

Precipitated Carbonate of Barytes
K.B. W.F.&C.

The only preventative for scum and discoloration, neutralizing the Sulphate of Lime in the Clay and Water.

Circulars and Particulars on Application.



For Economy of Fuel and Percentage of Hard Burned Brick.

This kiln has no equal, I will be glad to tell you all about it.

ALFRED YATES, Johnsonburg, Penn.



The PERFECT CLAY SCREEN.

Always Clean.
Perforations always open.
Separates the clay to full size of perforation
It is simple, durable and effective.

Impossible to clog or paste it over.
Especially adapted to moist clay.
Purchaser takes no risk.

Satisfaction guaranteed or no pay.

... Write us for full information ...



View on underside showing action of Rotary Brush

HAS NO EQUAL.

ELDER & DUNLAP,
Bloomington, Ill.

Standard Dry and Wet Pans

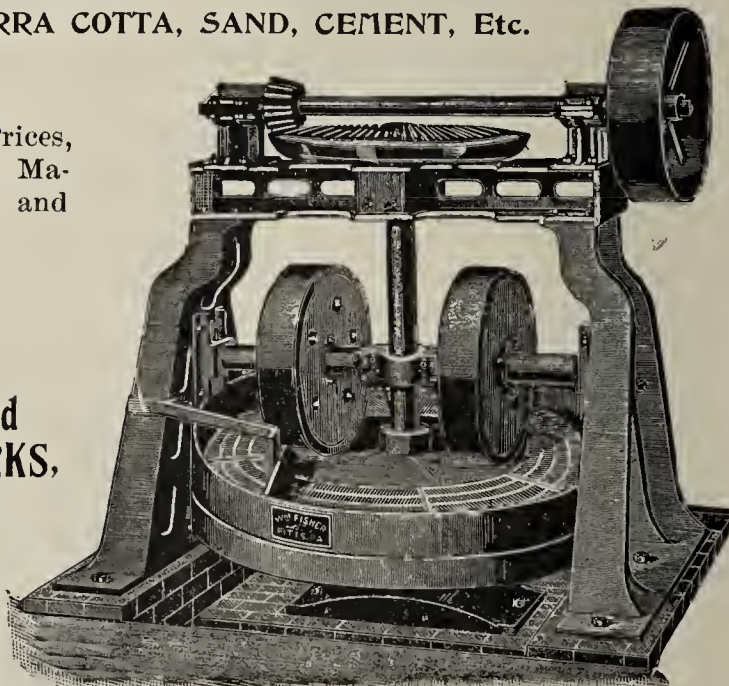
For BRICK, TERRA COTTA, SAND, CEMENT, Etc.

When writing for Prices, state kind of Clay or Material to be ground and capacity required.

FISHER ENGINE FOUNDRY and MACHINE WORKS.

Phillips & McLaren,
Proprietors,

24th and Smallman Sts.,
PITTSBURG, PA.



MENTION THE CLAY-WORKER,
WHEN WRITING TO ADVERTISERS,
MENTION THE CLAY-WORKER.

NEW DISCOVERY KILN

Patented April 13, 1886, June 1888 Nov. 17, 1891.

More than 1,000 in use in United States, Canada and France.

It is neat, compact, durable, easy to handle, constructed on scientific principles. Has been improved and is now burning almost everything made from clay, such as Sewer Pipe, Vitrified Pavers, Etc., to Pottery and finer wares. Built any size up to 100,000. In short it leads the way.

Reward For Information of Infringements.

To know more and what users say of it, address,

E. M. PIKE, Patentee

CAPT. G. H. ETTLA, Agt. } Marietta, Pa.

Chenoo, Ill.



GEO. S. COX'S Ready Made Cutting Wires,

Always give Satisfaction.

EAST LIVERPOOL, OHIO.

Send for Samples and Prices.

Davis's Brick, Tiles and Terra Cotta. Third Edition. Revised, Improved and Enlarged.

RECENTLY PUBLISHED.

A Practical Treatise on the Manufacture of

Brick, Tiles and Terra-Cotta

Including Stiff Clay, Dry Clay, Hand-made, Pressed or Front, and Roadway Paving Brick, Enameled Brick, with Glazes and Colors, Fire Brick and Blocks, Silica Brick, Carbon Brick, Glass Pots, Retorts, Architectural Terra Cotta, Sewer Pipe, Drain Tile, Glazed and Unglazed Roofing Tile, Art Tile, Mosaics, and Imitation of Intarsia or Inlaid Surfaces. Comprising every product of Clay employed in Architecture, Engineering and the Blast Furnace. With a Detailed Description of the Different Clays employed, the Most Modern Machinery, Tools and Kilns used, and the Processes for Handling, Disintegrating, Tempering and Molding the Clay into Shape, Drying, Setting and Burning. By Charles Thomas Davis. Third Edition. Revised and in great part rewritten. Illustrated by 261 engravings. 662 pages, 8vo. Price\$5.00

This volume will be sent by mail to any address in the world, or delivered by express C. O. D., freight paid, to any address in the United States for \$5.00.

A circular of eight pages, with specimens of the illustrations, showing the full Table of Contents, will be sent free to any one furnishing his address.

HENRY CAREY BAIRD & CO.

Industrial Publishers, Booksellers and Importers, 810 Walnut St. PHILADELPHIA, PA., U. S. A.

AN IMPROVED MUFFLED KILN

For Burning Terra Cotta, Fine Front Brick, Enameled Brick, Encaustic Tile, etc., etc.



THIS IS the best and cheapest kiln in the long run. It is guaranteed to do its work in a perfect and even way. There is no loss in burning with this kiln. Every piece put in comes out perfectly burned, whether set in top or bottom. We have had many years' experience in building terra cotta, brick and tile kilns of different kinds, and can guarantee successful and satisfactory results, being practical kiln builders. Our terms are reasonable. Write for particulars, stating character and capacity of kilns desired.

F. HUNDT & CO.,

801 North Winchester Ave., Chicago, Ill.

F. H. C. MEY, Chain Belting Engineering Works,

Approved Appliances for

Elevating, Conveying and Transmission of Power,

64 to 68 Columbia St., BUFFALO, N. Y.



Mey Detachable Chain Belt.



Ewart Detachable Chain.

THIS Elevator is for taking the clay into the Brick Machine; the tempered clay is shoveled from the soak pit into the trough from which it is elevated into the brick machine. The advantages derived from this apparatus will be noticed at a glance by every practical brickmaker.

It gives the machine a uniform feed, takes less power and manual labor to manipulate, and the manufacturer is enabled to



MEY PATENT CLAY ELEVATOR.

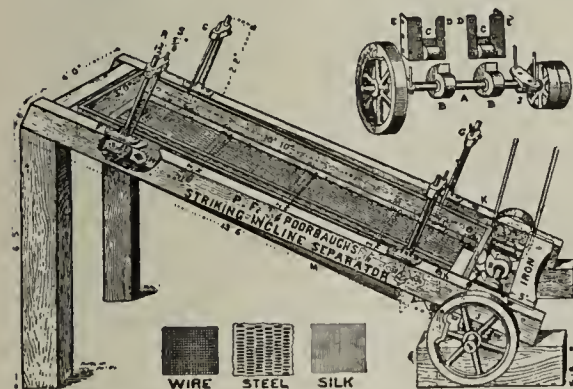
Make Many More Thousands

Of the best quality of brick in a day than he can by the old method, thereby saving time and making money.

Send for Catalogue

STRIKING INCLINE SCREEN

For Clay, Shale, Sand, Crushed Stone, Cement, Fertilizer and all Minerals.



These Screens are in use at Brick yards in Pennsylvania, Ohio, West Virginia, Illinois and other States. This Screen makes perfect separation, either from sheds or banks, of all clays or shale.

Manufactured by the

THE PITTSBURG MINERAL SCREEN CO.

Write for Prices.

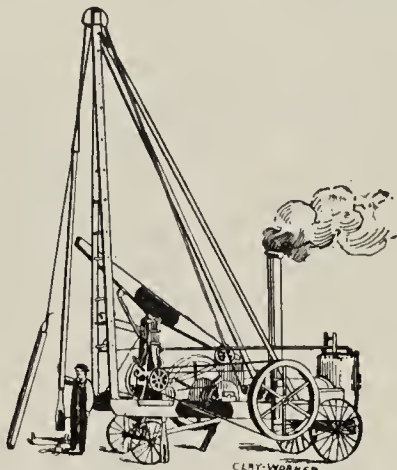
PITTSBURG, PA.

COLORIFIC.

For coloring Brick, Mortar and all Clay Products a deep and permanent red. Most, if not all, colors in the market, are artificially prepared. Colorific is a natural color. References and directions furnished for use. Sample free. Ask for price of
WESTBROOK & WELLS,
Ogdensburg, N. Y.

W. R. Osborne,

Contractor for
Artesian Wells of any Diameter.



PUMPS, WIND MILLS with large pumps specially adapted for keeping clay pits clear of water.

Eastern agent for the famous Star Drilling Machinery. Machines capable of drilling wells from 150 to 2,500 feet, any diameter desired. Practical men furnished for work of this class. All machinery handled by me guaranteed first-class.

Tanks of any size from 100 to 100,000 gallons capacity.

152 State Street,
PERTH AMBOY, N. J.

Steubenville Foundry and Machine Works.....

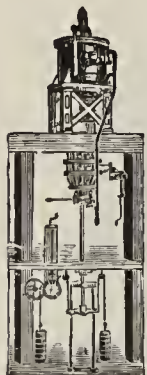
ESTABLISHED
IN 1820.

Manufacturers of

STEAM SEWER PIPE PRESSES

Of different sizes, making from 2 to 30-inch pipe inclusive.

Pipe, Brick, Tile, Coving,
Fire Proofing and Building
Block Dies.



CLAY GRINDING
AND TEMPERING
PANS AND PUG
MILLS.

Feed Screws for Mining Clay; Steam Engines and every variety of Iron and Brass Castings, Shafting and Pulleys.

Send for circulars and estimates.

JAS. MEANS & CO.,
Steubenville, Ohio.

BRICK CARS

30 Different Styles,

Let us Save You Money. —

The
Run
Easy
Kind.

Walworth Run Foundry Co.,

CLEVELAND, OHIO.

Conveying, Elevating and... Power-Transmitting Machinery.

H. W. CALDWELL & SON CO.

Specialties for Handling
Material of
all Kinds.

GENERAL MACHINISTS,
127, 129, 131, 133 West Washington St.,
CHICAGO.

CALDWELL
Steel Conveyor.

Manufactured exclusively by us at Chicago, with latest
Improvements

Send for Catalogue.



CALDWELL-AVERY SEAM-
LESS STEEL ELEVATOR
BUCKETS.

LINK BELTING.
SPROCKET WHEELS
COTTON BELTING.
RUBBER BELTING.
LEATHER BELTING.
BELT CLAMPS.
ELEVATOR BOLTS.
ELEVATOR BUCKETS.
CONCRETE MIXERS.
FRICTION CLUTCHES.
JAW CLUTCHES.
COUPLINGS.
FLEXIBLE SPOUTS.

GEARING (all kinds.)
ELEVATOR BOOTS.
HANDERS.
PERFORATED METALS.
PILLOW BLOCKS.
IRON PULLEYS.
WOOD PULLEYS.
SHAFTING.
SET COLLARS.
SWIVEL SPOUTS.
TAKE-UP BOXES.
TURN HEAD SPOUTS.
WIRE CLOTH.



THE HOT BLAST APPARATUS

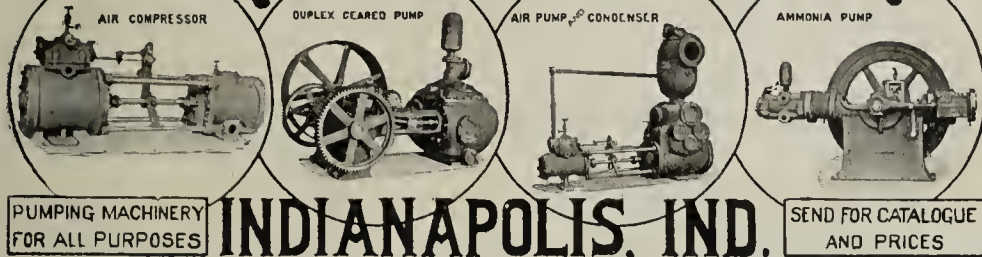
FOR DRYING BRICK TILE AND TERRA COTTA

SEND FOR CATALOGUE

American Blower Co

SUCCESSOR TO
HUYETT & SMITH MFG CO
DETROIT MICH

DEAN BROS' STEAM PUMP WORKS.



PUMPING MACHINERY
FOR ALL PURPOSES

INDIANAPOLIS, IND.

SEND FOR CATALOGUE
AND PRICES

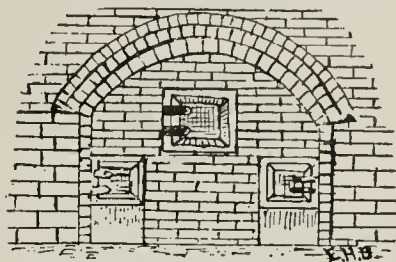
Dry Pan Clay Crushers.

CLAY SCREENS AND ELEVATORS.

....

Eagle Iron Works,
Des Moines, Iowa.

Swift's Kiln Furnace,



F. E. SWIFT'S PATENT SLACK COAL COKER,
GAS GENERATOR AND SMOKE CONSUMER.

CAN BE ATTACHED to any kind or style
of Up or Down-Draft kiln. Nothing but
slack or waste coal
used from start to
finish of burn.



Fires not dis-
turbed but once in
10 hours till water-
smoke is off. Guar-
anteed to water-
smoke dry press
brick or the tender-
est of clays or ware
of any kind without
damage. These fur-
naces can be seen in
operation at my
works at all seasons
burning drain tile
in winter and brick
in Summer. It will
pay you to investi-

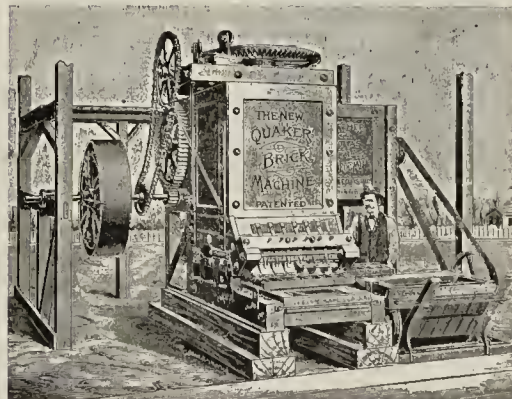
gate—I can save you good money.
For further particulars, address

F. E. SWIFT,
Washington, Iowa.

Soft Mud Brick Machinery

THE BEST FOR THE LEAST MONEY.

A complete combined outfit con-
sisting of the Extra Heavy Quaker
Spiral Pug Mill and Mould Sand-



ing Machine, capacity 40,000 or more
per day. We carry in stock a full line
of first-class brickyard supplies at a
very reasonable price.

Send for Catalogue.

James W. Hensley,

General Agent,
Successor to S. K. FLETCHER.

INDIANAPOLIS, IND.

BRICK MACHINES AND REPRESSES.

....

THIS cut represents our Stiff Mud Brick
Machine. It will work any kind of
brick material including fire clay, shale or
common clay right from
bank without the use of a
pug mill. Each brick is
pressed separately and can
be haked 7 or 8 high, or
repressed right from ma-
chine.

Over 500 in operation.

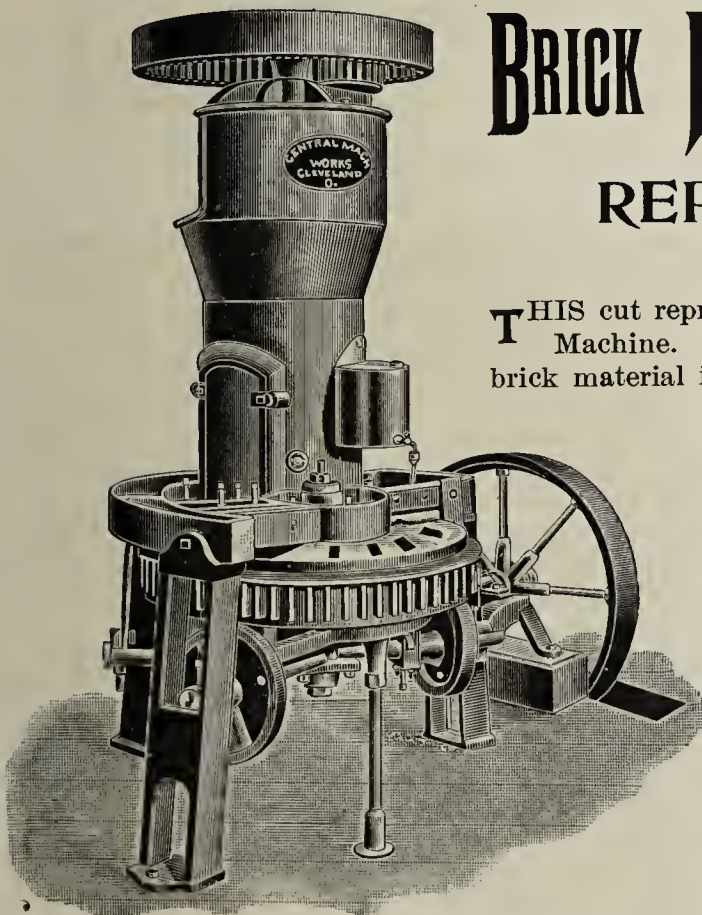
Send for price and circulars

Manufactured by

CENTRAL
MACHINE
WORKS,

226-236 Abbey St.

Cleveland, Ohio.



NOTICE—We furnish all supplies and repairs for any make of the
"Sword" Brick Machine.

M. V. B. WAGONER'S

SLIP CLAY { For Glazing of Pottery } WORKS

ESTABLISHED 1845.

Clay in stock in any quantity, in barrels and bulk by the carload.

Office, 20 Ten Broeck St., ALBANY, N. Y.

A. F. TENNILLE'S

Bureau of

News and
Legislative
Information,Congressional, Financial and Commercial.
Tariff, Silver Question and Copyrights a specialty. Information and Correspondence furnished in all languages.BLISS BUILDING, Room 22,
35, 37 and 39 B St. N. W., WASHINGTON, D. C.

What do YOU know about

Bricks, Tiling, Pottery?

WE know ALL about

SPLENDID LOCATIONS

For the manufacturing of either of the above
along the lines of the

Cotton Belt Route.

Splendid clays in abundance; Superior shipping facilities to local markets in all directions; and other inducements that will make it worth your while to go in business, on our road.

For particulars write

J. St. KOSLOWSKY,

or Industrial Agt., St. Louis, Mo.

E. W. LABEAUME,

G. P. and T. A., St. Louis, Mo.

Solid Train Between
Sandusky and Peoria—AND—
INDIANAPOLIS and
MICHIGAN CITY,
FT. WAYNE and
CONNEERSVILLE.

Through tickets sold to all points in the United States and Canada.

NORTH BOUND—LEAVES.

No. 20 Passenger.....	7:00 a. m.
*No. 22 Passenger.....	1:20 p. m.
No. 24 Passenger.....	7:00 p. m.

SOUTH BOUND—ARRIVES.

*No. 21 Passenger.....	10:20 a. m.
No. 23 Passenger.....	2:50 p. m.
No. 25 Passenger.....	6:20 p. m.

*Daily.

Union Depot connections at BLOOMINGTON and PEORIA for points WEST, SOUTHWEST and NORTHWEST.

Direct connections made at LIMA, FOSTORIA, FREMONT or SANDUSKY for all points EAST.

Immediate connections at TIPTON with trains on Main Line and I. & M. C. Div., for all points NORTH, SOUTH, EAST and WEST.

For tickets, rates and general information, call on
A. H. SELLARS, Agent,
Lake Erie & Western R. R.
C. F. DAILY, Gen. Pass. Agt.
INDIANAPOLIS, IND.

FIRE

Dover Fire Brick Co.,
INCORPORATED 1870. MANUFACTURERS OF
Dover and Buckeye Fire Brick,
Unexcelled for Kiln Purposes.
44 Mercantile Bank Bldg., Cleveland, Ohio.

BRICK

Do You Want

Where there is a good opening for a BRICKYARD? Who are the new BRICK firms and companies? What are the latest BRICK-making inventions? and a dozen other things that every BRICKman ought to know, and the knowing of which means more business and better business? Address with your latest catalogue or circular,

Commercial Intelligence Dep't, ASSOCIATED TRADE & INDUSTRIAL PRESS,
ESTABLISHED NINE YEARS. Rooms 9, 10, 11, 12 and 13, 610 13th Street, WASHINGTON, D. C.

No Dry Press Brick Plant Complete

..... WITHOUT

The Carmichael
Clay Steamer,

T. W. CARMICHAEL, Inventor and Manufacturer,

Wellsburg, W. Va.

Fourteen (14) sold already this Season.



"LEVIATHAN."

"Upon Earth There is not His Like."

.....Sept..... 1896.

MAIN BELTING CO., 55 and 57 Market St., Chicago, Ill.

Gentlemen:—Please ship us via freight, 14' x 13' 8 ply "Leviathan" Belting. The reason you have not heard from us of late is, we have been trying the "just as good for less money" belting. You can count on our future orders for "LEVIATHAN." Prompt shipment of the above will oblige.

Yours very truly,

Manufactured under Special Process.

A Guarantee of Superiority.

NOTE—By our special process of treating the material used in the manufacture of this belting, the fibre is toughened, the elasticity is preserved and the stretch reduced to a minimum.

Main Belting Company,

Sole Manufacturers LEVIATHAN BELTING,

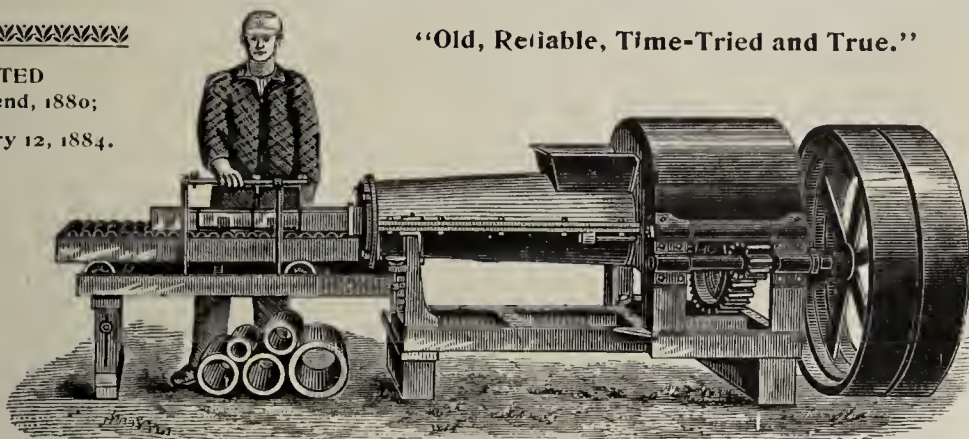
55 and 57 Market St., CHICAGO, ILL.

PHILADELPHIA:
1219 Carpenter Street.

BOSTON:
120 Pearl Street.

KELLS & SON'S IMPROVED BRICK AND TILE MACHINES

PATENTED
June 22nd, 1880;
and
February 12, 1884.



"Old, Reliable, Time-Tried and True."

P. H. Kells, the Original Inventor of the Auger Machine.

THIS MACHINE works clay direct from the bank for both brick and tile. Bricks are taken direct from the machine to the backs and need no repressing for the finest fronts. It has but one set of gears and makes all kinds of brick and different sizes of tile by changing dies. For strength and durability we except none. We challenge the world to produce a combined machine that will do the same amount of work with the same amount of power. We manufacture Crushers, Trucks and Barrows. End-cut, side-cut paving brick and Board Delivery—make perfect edges and corners.

We have had Twenty-nine Years' Experience in the Manufacture of Brick and Tile Machines.

We have made an improvement on our No. 1 Machine by which we can make tile from 3 inches up to 12 inches and on our No. 2 Machine we can make tile from 2½ up to 10 inches.

For Illustrated Circulars, Prices, Etc., address

KELLS & SONS, Adrian, Mich.

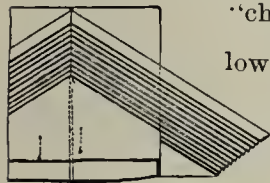
H. C. BAIRD & SON,

PARKHILL, ONTARIO.

Sole Manufacturers for the Dominion of Canada of the above machines, also makers of the New Quaker Brick Machine.

Still Further Testimony!

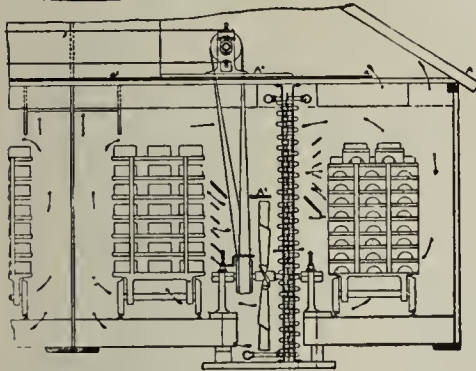
Soft Mud Brick Dried in 10 or 12 hours.



Most trying service with large brick of tough clay that is liable to "check," and slow to dry.

The great circulation of air does it, as of out of door drying, at low temperature. The correct principle, successfully adapted and demonstrated. Saves more time than the locomotive over the stage coach; with fans and machinery, inside and close to the work, that pay well and cost no trouble to run, as users attest.

The fans save in cars, pipe and enclosure to make the first cost less than half that of other dryers, and in continuous use less than one-fourth of the fuel in using engine exhaust steam only for heating—much more of it, and without back pressure.



The INSIDE FAN DRYER.

U. S. Pat. Mar. 31, 1891. No. 449,170.
U. S. Pat. Mar. 31, 1891. No. 449,231.
British Pat. Mar. 31, 1891. No. 5,520.
Canadian Pat. May 30, 1892. No. 39,025.
Canadian Pat. May 30, 1892. No. 39,026.

You have the best drier in the market and I purpose in the near future to put in another two track section. Wishing you success, I am

Yours truly,
JOHN W. FRID.

"And Met the Requirements in Every Case."

PHILADELPHIA, December 14, 1892.

MR. S. G. PHILLIPS, Woodbridge, N. J.

DEAR SIR—Replying to your favor of recent date, it gives us pleasure to state that all of the Dryers erected by us under your patents for customers have given satisfaction and met the requirements in every case. The brick have been dried uniformly without cracks.

Yours respectfully,

CHAMBERS BROTHERS CO.

J. H. CHAMBERS, Gen'l Mgr.

S. G. PHILLIPS.

Agent and
Patentee,

161 Grand Street.

Rahway, N. J.

THE CENTRAL PASSENGER ASSOCIATION 1,000-MILE INTERCHANGE-ABLE REBATE TICKET

Is for sale at principal Ticket Offices of
THE PENNSYLVANIA LINES.

It is honored one year from date of sale for Exchange Tickets over either of the following named Lines:

Ann Arbor,
Baltimore & Ohio,
Baltimore & Ohio Southwestern,
Chicago & Eastern Illinois,
Chicago & West Michigan,
Cincinnati & Muskingum Valley,
Cincinnati, Hamilton & Dayton,
Cleveland & Marietta,
Cleveland, Canton & Southern,
Cleveland, Cincinnati, Chicago & St. Louis,
Cleveland, Lorain & Wheeling,
Cleveland Terminal & Valley,
Columbus, Hocking Valley & Toledo,
Columbus, Sandusky & Hocking,
Detroit & Cleveland Steam Navigation,
Detroit, Grand Rapids & Western,
Dunkirk, Allegheny Valley & Pittsburgh,
Evansville & Indianapolis,
Evansville & Terre Haute,
Findlay, Fort Wayne & Western,
Flint & Pere Marquette,
Grand Rapids & Indiana,
Indiana, Decatur & Western,
Lake Shore & Michigan Southern,
Louisville & Nashville (Between Louisville and Cincinnati and between St. Louis and Evansville),
Louisville, Evansville & St. Louis,
Louisville, Henderson & St. Louis,
Michigan Central,
New York, Chicago & St. Louis,
Ohio Central Lines,
Pennsylvania Lines West of Pittsburgh,
Peoria, Decatur & Evansville,
Pittsburg & Lake Erie,
Pittsburg & Western,
Pittsburg, Lisbon & Western,
Toledo, St. Louis & Kansas City,
Vandalia Line,
Wabash Railroad,
Zanesville & Ohio River.

The price of these Tickets is Thirty Dollars each. They are not transferable. If the ticket is used in its entirety and exclusively by the original purchaser, a rebate of Ten Dollars is paid by the Commissioner of the Central Passenger Association.

E. A. FORD.

Pittsburg, Pa., Gen'l Passenger Agent.

STOP-LOOK LISTEN

THE
POPULAR

MONON ROUTE
LOUISVILLE NEW ALBANY & CHICAGO RY. CO.

IS THE BEST LINE TO

CHICAGO

TIME
REDUCED TO 4¾ HOURS.
FOUR DAILY TRAINS

Leave Indianapolis	{ 7:00 a. m., 11:50 a. m. 3:35 p. m., 12:55 night
Arrive Chicago	{ 12:00 noon, 6:00 p. m. 8:20 p. m., 7:20 a. m.
Trains	{ 3:30 a. m., 7:45 a. m.
Arrive Indianapolis	{ 2:35 p. m., 4:37 p. m.

LATEST IMPROVED

VESTIBULED TRAIN SERVICE

Pullman Sleepers, Elegant

PARLOR CARS AND DINERS

Local Sleeper in Indianapolis Ready at 8:30 p. m.

Leave Chicago, Returning, at 2:45 a. m.

Can be Taken Any Time After 9:30 p. m.

TICKET OFFICES: 2 West Washington St.,
Union Station and Massachusetts Ave. Depot.

GEO. W. HAYLER, Dist. Pass. Agt.



VANDUZEN STEAM PUMP
JET
THE BEST IN THE WORLD.
Pumps Any Kind of Liquid.
 Always in Order, never Clogs nor
 freezes. Every Pump Guaranteed.
10 SIZES.
 200 to 12000 Gallons per Hour.
 Cost \$7 to \$75 each. Address
THE E. W. VANDUZEN CO.,
 102 to 108 E. Second St., Cincinnati, O.

The F. F. V. Vestibule Limited via the
 Chesapeake & Ohio R'y, is the only Solid
 train with through Dining Car between
 New York, Philadelphia, Baltimore,
 Washington, Cincinnati and the West.
 Lighted with Electricity. Heated with
 Steam.

C. B. RYAN,
 H. W. FULLER, Ass't Gen'l Pass. Agent.
 Gen'l Pass. Agent, CINCINNATI, OHIO
 WASHINGTON, D. C.

VANDALIA LINE

The Short Line for

ST. LOUIS AND THE WEST.

LEAVE INDIANAPOLIS,	AT. TERRE HAUTE	AR. ST. LOUIS.
* 7:20 am	10:05 am	.....
* 8:10 am	10:15 am	3:15 pm
* 12:40 noon	2:35 pm	7:12 pm
* 7:00 pm	9:04 pm	1:44 am
* 11:20 pm	1:30 am	7:00 am
*Daily.		

All trains carry first-class coaches. 12:40
 noon train has Parlor and Dining Cars for St.
 Louis. 11:20 pm train has local sleeping cars
 starting from Indianapolis for Evansville,
 and St. Louis, open every night at 8:30. All
 trains enter the Union Passenger Station at
 Terre Haute and St. Louis.

Ticket Offices, 48 West Washington St., 46
 Jackson Place and Union Station.

W. W. RICHARDSON, Dis. Pass. Agt.

ARE YOU LOOKING

FOR A CHANGE IN LOCATION?

If you are not satisfied with your present
 site, or if you are not doing quite as well as
 you would like to, why not consider the advan-
 tages of a location on the Illinois Central R. R.
 or the Yazoo & Mississippi Valley R. R.? These
 roads run through South Dakota, Minnesota,
 Iowa, Wisconsin, Illinois, Indiana, Kentucky,
 Tennessee, Mississippi and Louisiana, and
 possess

FINE SITES FOR NEW MILLS

BEST OF FREIGHT FACILITIES

CLOSE PROXIMITY TO

COAL FIELDS and DISTRIBUTING CENTERS

AND

INTELLIGENT HELP OF ALL KINDS

MANY KINDS OF RAW MATERIAL

For full information write the undersigned
 for a copy of the pamphlet entitled

100 Cities
 and Towns

WANTING INDUSTRIES

This will give you the population, city and
 county debt, death rate, assessed valuation of
 property, tax rate, annual shipments, raw
 materials, industries, desired, etc.

To sound industries, which will bear investi-
 gation, substantial inducements will be given
 by many of the places on the lines of the Illi-
 nois Central R. R., which is the only road
 under one management running through from
 the Northwestern States to the Gulf of Mexico.
 GEO. C. POWER, Industrial Commissioner I.
 C. R. R. Co., 506 Central Station, Chicago.

G. COLDEWE & CO.,

MANUFACTURERS OF ALL KINDS AND SHAPES OF

HAND and....

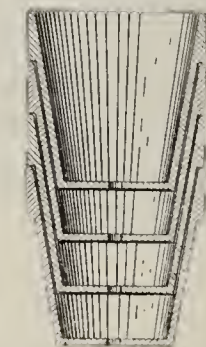
MACHINE

MOULDS

We manufacture the the most substantial Moulds known,
 and guarantee every Mould to be first-class
 in material and workmanship.

A Special Discount on all orders received
 on or before March 1st.

No. 829 Sixth St., Milwaukee, Wis.



Make Money

WITH THE ONLY SUCCESSFUL

Flower Pot Machine

(PATENTED.)

No expert workmen required.

Capacity in 10 hours:

6,000 two-inch Pots; 3,500 five-inch Pots;
 4,000 four-inch " 2,000 seven-inch "

Write for Circular and prices.

The Rockwood Mfg. Co.,

78 South Pennsylvania St.,

INDIANAPOLIS, IND.



CHAMPION Brick Mould SANDING MACHINES.

This cut represents the latest im-
 proved Champion. No belts, apron
 or gearing. Simple, strong, and
 Serviceable.

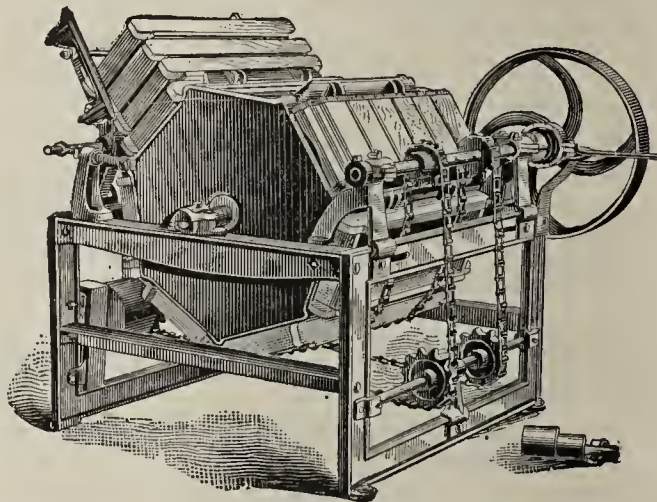
A. H. NEWTON,

Manager and Sole Agent,
 HAVERSTRAW, N. Y.

THE case of Newton vs. Buck
 was decided March 16th, 1896
 by Judge Cox holding that New-
 ton was the owner of the patent
 301,087 and had the exclusive right
 to manufacture machines under
 that patent, that Buck infringed
 it and should pay Newton dam-
 ages and profits and cease manu-
 facturing.

Defendant appealed from this decree, and the Court of Appeals, on a technical ground, has
 reversed the decree, so that the whole matter will have to be re-tried, and a suit for that pur-
 pose has been commenced against Buck and is now pending in the United States Circuit Court
 for the Northern District of New York.

Only one patent No. 301,087 was involved in that decision and even if it stand, it only gives
 Buck the title to that one patent, while eight other patents, Nos. 284,115; 290,847; 385,790; 322,455;
 372,698; 327,711; 407,030 and reissue 10,976 belong to Newton without question, and no sanding ma-
 chine can be made by Buck without infringing three or more of them. Suit has been com-
 menced on these patents against Buck, and any persons purchasing from him or his agents will
 be prosecuted for infringement.



4000 TO 5500

(Gallons of Water per hour.)

BY HAND-POWER.

Pumps, Hand-power Pumps.

(LOUD'S PATENT.)

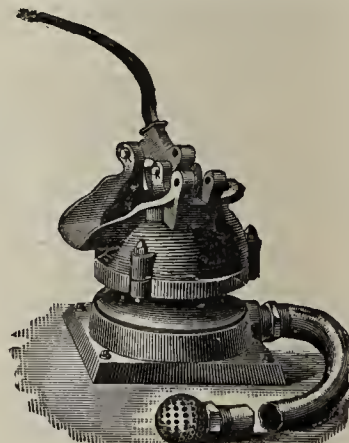
These Pumps are simple, durable and low-priced.

A large capacity and easy working pump for Brick Yards, Water Works,
 Sewer Contractors, Foundation Builders, Miners, Quarries or where-
 ever it is desired to raise a large quantity of water by Hand-power. The pump has large
 valves (accessible by hand) and will pump water containing sand, gravel, mud, sewage
 matter, etc., without choking or any perceptible wear.

Send for circular and price list. Manufactured by

THE UNION HARDWARE CO.,

TORRINGTON, CONNECTICUT.



MADDEN & CO.,

Successors to NOLAN, MADDEN & CO.,

Manufacturers
... of

Tile and Brick Machines.



No. 5 Auger Tile and Brick Machine with our New Endless Belt Cut-off Table, which has no equal for handling tile of all sizes from 3 to 12-inch. This table has carriers which move with the tile, and can be readily and perfectly adjusted to any size tile.

Our Upright Tile Machines are unequalled for large tile, 10 to 24-inch. These Machines are all sold on their merits and warranted to do first-class work. We also manufacture Soft and Stiff Mud Brick Machines.

Full line of Tile and Brickyard supplies kept constantly on hand. Get our prices.

MADDEN & CO., Rushville, Ind.

Elevators

For handling
CLAY,
COAL,
SAND,
BRICK,
TILE,
PACKAGES.

Also Furnish
RUBBER,
LEATHER,
COTTON
BELTING.

JEFFREY

Roller, Steel and Special CHAINS
FOR
**ELEVATING
CONVEYING
MACHINERY**
FOR HANDLING MATERIAL OF ALL KINDS.
Power Transmission Machinery.
COAL MINING MACHINERY.
WIRE CABLE
CONVEYORS.
For long and
short distance
conveying.

THE JEFFREY MFG. CO., Columbus, Ohio.
Send for Catalogue. 163 Washington St., NEW YORK.

Conveyors.

Manufacture
SHAFTING,
PULLEYS,
HANGERS,
GEARS,
CLUTCHES,
BUCKETS,
BOOTS,
BOLTS,
Etc...

ARCHITECTURAL DRAWING

Designing; Architecture; Mechanical Drawing; Machine Design; Stationary, Locomotive and Marine Engineering; Electricity; Plumbing; Railroad, Municipal, & Bridge Engineering; Surveying and Mapping; Sheet Metal Pattern Cutting; Bookkeeping; Shorthand; English Branches; Mining; Metal Prospecting.

All who study **GUARANTEED SUCCESS.**

Fees Moderate, Advance or Installments.

Circular Free. State subject you wish to study.

International Correspondence Schools, Box 958, Scranton, Pa.



Indiana, Decatur & Western RAILWAY.

Short line between INDIANAPOLIS and KANSAS CITY. The only line running Reclining Chair and Sleeping Cars between INDIANAPOLIS, and DECATUR, SPRINGFIELD, JACKSONVILLE and HANNIBAL, MO.

Through Sleeping Cars to St. Louis, Mo., via I. D. & W. Clover Leaf Route.

TIME OF TRAINS AT INDIANAPOLIS:

LEAVE.

Mail and Express.....	8.15 a m
Accommodation.....	3.45 p m
Fast Express.....	11.10 p m

ARRIVE.

Fast Express....	3.35 a m
Accommodation	10.40 a m
Mail and Express.....	4.40 p m

JNO. S. LAZARUS, Gen. Pass. Agent.



INDIANAPOLIS AND CINCINNATI LINE

6 Trains Daily. Parlor Cars and Cafe Dining Cars on day trains; Pullman, Compartment and Standard Sleeping Cars, and Chair Cars, also Wagner Sleeping and Chair Cars on night trains. Direct Connection made at CINCINNATI without Omnibus and Transfer, for all points

**SOUTH
and
EAST**

INDIANAPOLIS, TOLEDO AND DETROIT

The Michigan Line (via Hamilton.)

5 Trains daily to Dayton.
2 Trains daily to Toledo.
2 Trains daily to Detroit.

Observation, Vestibuled Coaches and Parlor Cars on Through Express Trains. Pullman and Wagner Sleeping Cars on night trains.

G. W. Hayler, D. P. A. } Indianapolis,
W. J. Nichols, T. P. A. } Ind.

D. G. EDWARDS,
Passenger Traffic Manager.

OLD SHELDON WHISKEY

Covington,
Kentucky.



The Peerless Whiskey of America.

Invaluable for Medicinal and Family Use.

Thoroughly Matured, of rich Natural Flavor, and Absolutely Pure.

SOLD DIRECT TO CONSUMERS

NO MIDDLEMAN. NO COMMISSION. NO FREIGHT.

As a Trial, we will send Express Prepaid, (boxed, no marks),

Five Quart Bottles of ten-year-old (Spring 1888)

Sheldon Rye Whiskey for \$5. Money returned if not perfectly satisfactory.

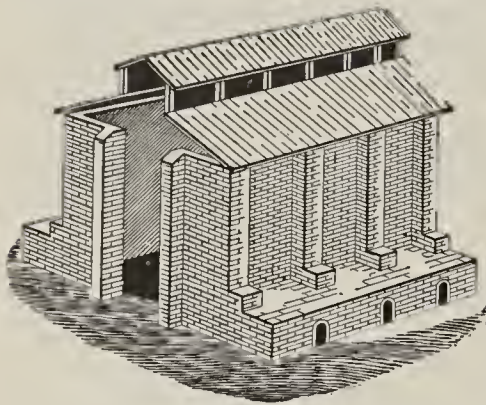
Descriptive Price List mailed free.

Address **THE SHELDON DISTILLERY CO., Covington, Ky., U. S. A.**

Patronized by the Medical Staff of the United States Army and Navy.

TAKE THE
BIG 4
TO
ST. LOUIS

Mention the CLAY-WORKER
WHEN WRITING TO ADVERTISERS,
Mention the CLAY-WORKER.



Up-Draft Kiln.

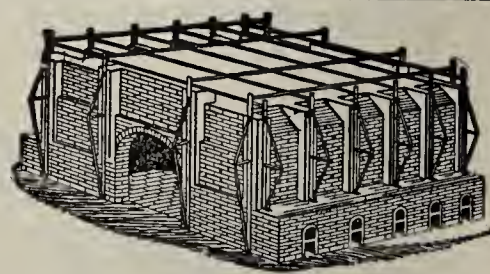
LOUIS H. REPELL'S IMPROVED-KILNS

For Burning all Kinds of Wares.

Having had years of practical experience in the management and actual burning of all kinds of kilns, claim it to be THE BEST Up-Draft KILN IN THE MARKET. The above cut represents my recently patented Down-Draft Kilns, in which I have combined all the points of merit that have been found necessary and valuable in my years of experience in the burning of the above style kilns.

For further particulars and full explanation, address

LOUIS H. REPELL, 2,422 Chestnut St., Kansas City, Mo.



Down-Draft Kiln.

ALSIP'S LATEST IMPROVED DOWN and UP-DRAFT KILN.

IS SO CONSTRUCTED that it burns the ware uniform from top to bottom, from side to side and from end to end of kiln, and no hard or soft spots as kiln is always under perfect control of the burner.

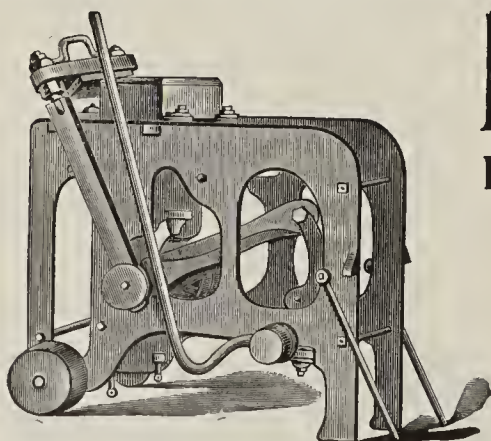
If you want the best kiln in the market, do not decide before making your acquaintance with the merits of a kiln that has been thoroughly tested, and is now giving perfect satisfaction in every respect.

Information on the subject of drying and burning of clays, especially dry pressed brick cheerfully given.

Address, **S. H. ALSIP,**

Days Brick Yard.

BELLEVILLE, ILL.



RED BRICK PRESS.

GEORGE CARNELL,

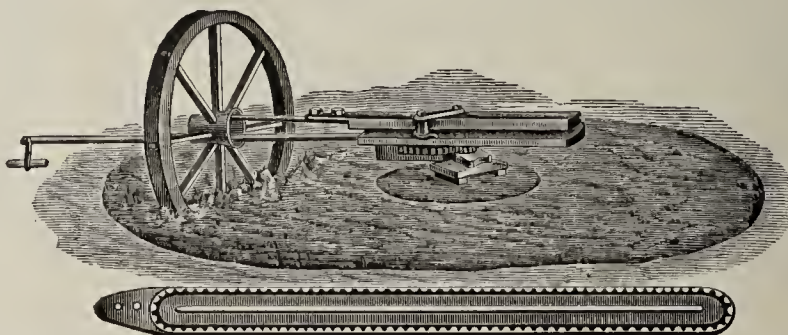
Nos. 1,819, 1,821 and 1,823 Germantown
Avenue and Fifth Street,
PHILADELPHIA, - - - PENN.

PHILADELPHIA BRICK MACHINE WORKS

Fire and Red Brick Presses all sizes.

....Machinists and Engineers.

Manufacturer of all kinds of Machinery used in the manufacture of Fire and Red Brick.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

Send for Circular and Price-List.

The "New South" Brick Machinery

Built for Business.

Has won over a number of others, in actual service, in the past. We expect to make it continue to win in the future.

• • •

GREENVILLE, S. C., Sept. 23rd, 1897.

J. C. STEELE & SON, Statesville, N. C.

Gentlemen:—Since putting in your "Xtra" machine with automatic cutter I have the brick business of this city all to myself. I made 112 in one minute this morning, and can make 50 M any day of 11 hours. The bricks are dandies.

Yours very truly,

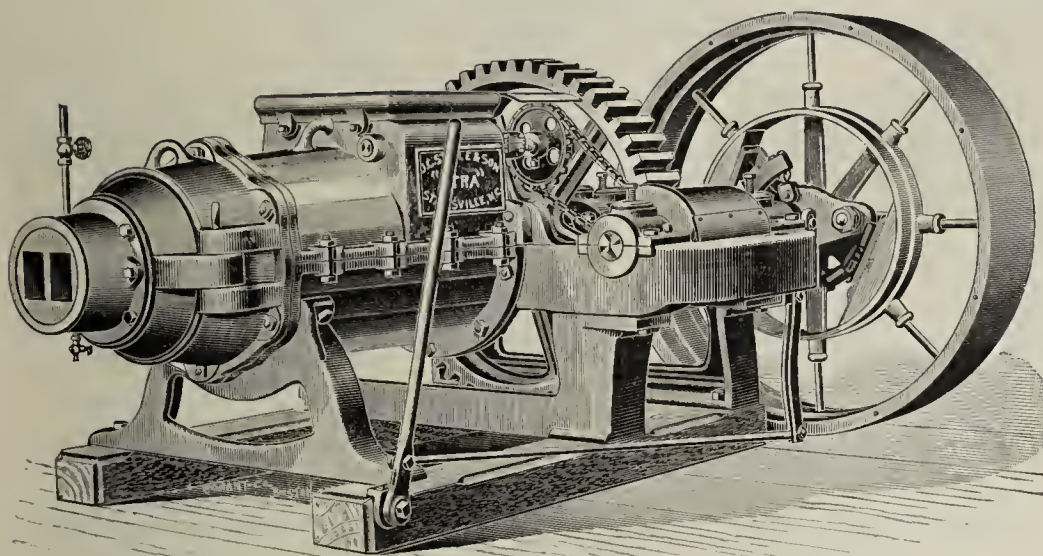
THOS. J. HANNON.

Mr. Hannon took out another machine that was almost new, and put in our "Xtra." We do not claim 50 M per day for this machine, but this is what our customers say that it will do.

• • •

Strictly modern machinery at the lowest price. Send for Catalogue.

J. C. STEELE & SON, Statesville, N. C.



X-tra Machine. Capacity 25,000.

The Standard Brick Machines,

MANUFACTURED BY

A. M. & W. H. WILES CO.,

Grassy Point, Rockland Co., N. Y.

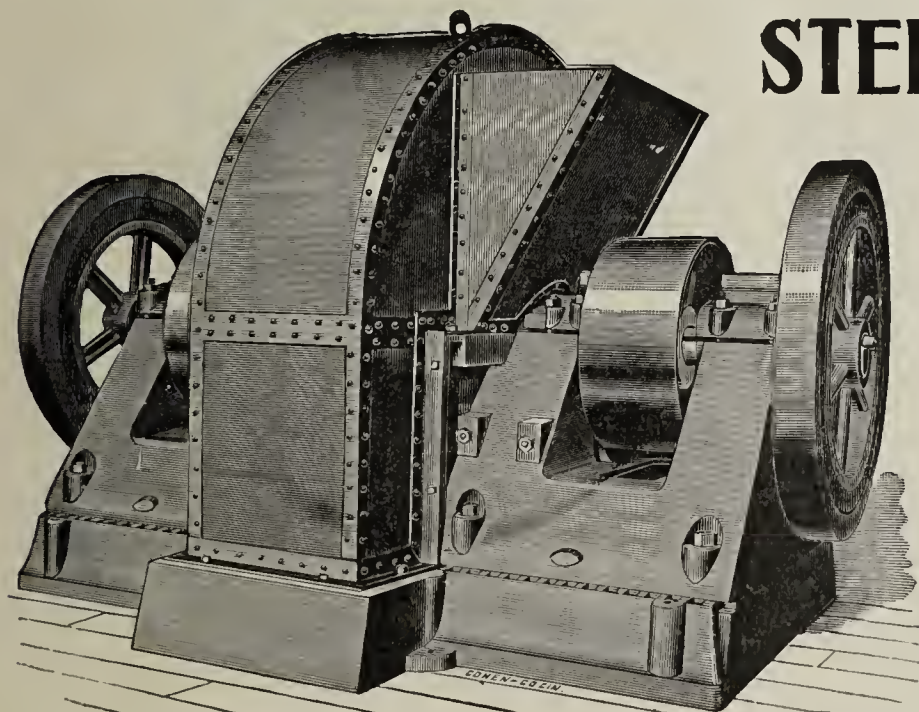
These Molding Machines have been in constant use for over 40 years and are the original of all machines now made that use a Pug Mill and Square Press, and are the best and most economical machines now in use.

Being established here in 1845, and having made a specialty of the manufacture of all articles used in Brickmaking since that year, and constantly making improvements, we are now enabled to offer parties the best and cheapest now in use.

We have fitted up many of the largest Brick Yards in the United States, and are prepared to furnish everything used in the manufacture of Brick in any part of the country.

[Mention the Clay-Worker.]

CORRESPONDENCE SOLICITED.



STEDMAN'S IMPROVED CLAY DISINTEGRATOR

For Thoroughly
Pulverizing Clay in a
Dry, Semi-Dry or
Damp Condition

Its construction is such that it will not clog in pulverizing damp clay, and the journal bearings are constructed dust proof.

Write for catalogue, giving full description, references and testimonials. Address,

Stedman's Foundry & Machine Works,

Aurora, Ind.

Morrison's Latest

Improved Kiln,

FOR BURNING BUILDING BRICK.

IT has no rival. Some of the largest brick plants in the country use it exclusively. Cost of construction within reach of every brick-maker. Price for license to use so reasonable that no one can object.

Write us for descriptive pamphlet, prices, etc., address

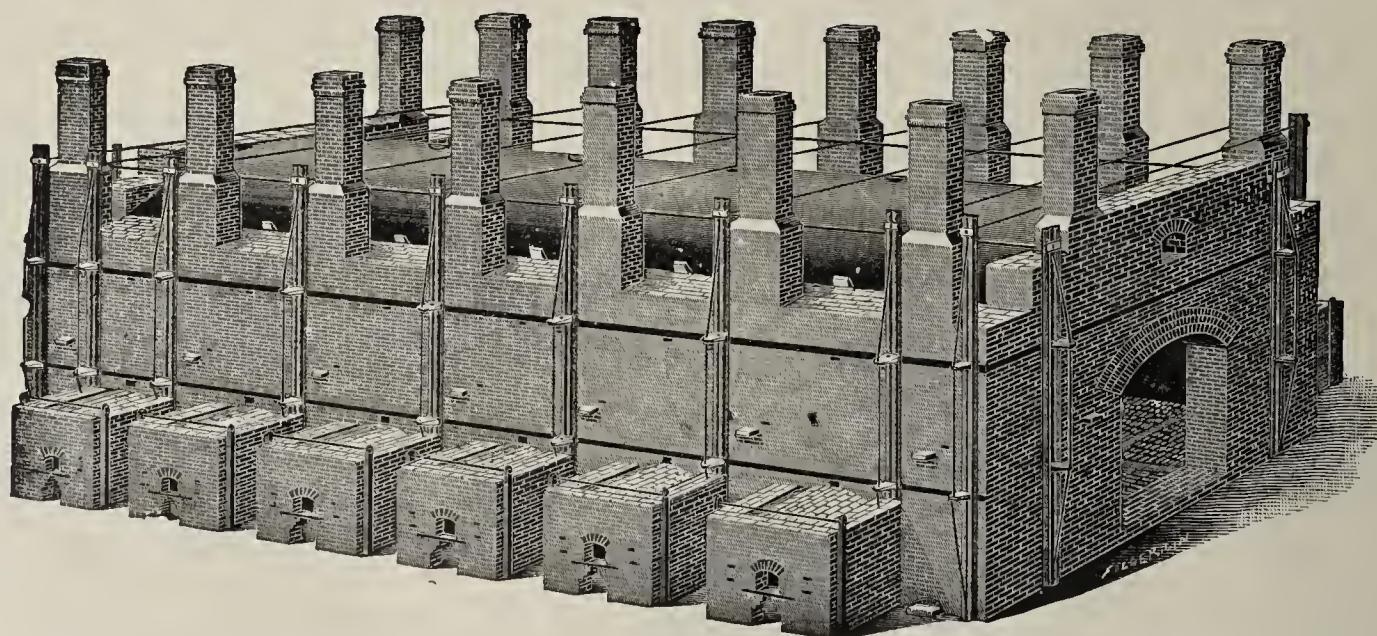
R. B. MORRISON & CO.,

P. O. Box 335.

ROME, GA., U. S. A.

The EUDALY

IMPROVED —
DOWN-DRAFT KILN
and DRYING SYSTEM.

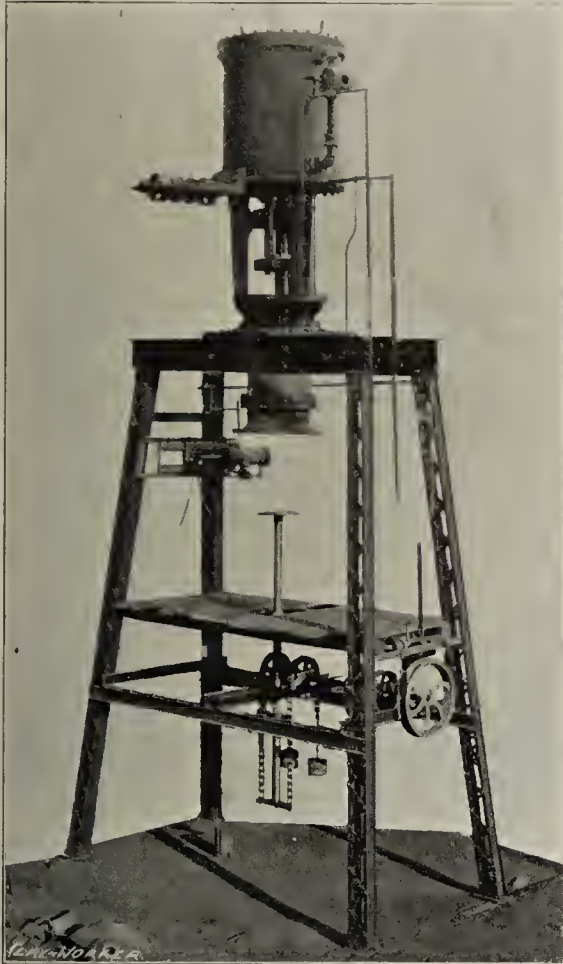


A very large number of manufacturers are now using the "EUDALY KILN" for burning all kinds of clay wares, especially front, ornamental and paving brick. These Kilns have gained a reputation for burning all hard and uniform brick. These Kilns are easily controlled and in every way practicable and desirable.

We have made a number of very valuable improvements since we first began the erecting of Kilns. Among these improvements is a complete system for conveying the hot air from a cooling to a green kiln, or from a cooling kiln to the drying tunnels for drying purposes, or to the buildings for heating.

The peculiar arrangement of the out-let flues makes it easy to carry the heat to any desired point through my system of under-ground connecting tunnel flues. By this system brick can be dried with the waste heat. We will take pleasure in giving any information we can on the subject of handling, burning, or drying clays. Address,

W. A. EUDALY, 509 Johnston Bldg. Cincinnati, Ohio.



LATEST IMPROVED SEWER PIPE PRESS.

**LATEST
IMPROVED**

Sewer Pipe Press

STEEL CONSTRUCTION FRAME.

In all Respects 365 Days Ahead of Others.

Write for Catalog of

Dry and Wet Pans,

COMBINATION GRINDING and
TEMPERING MILLS.

• • • •

If Your Sewer Pipe Dies do not Work Satisfac-
torily, Write us.

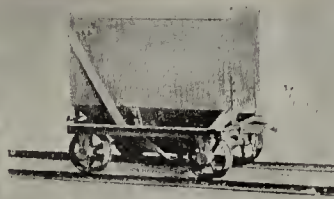
Manufactured by

TAPLIN, RICE & CO.,

AKRON, OHIO.



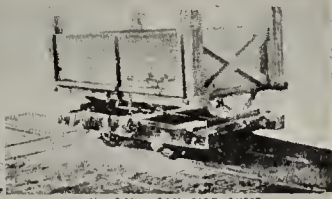
No. 146. TURNTABLE.



No. 150. STEEL BOTTOM DUMP.



No. 170. STEEL SIDE DUMP.



No. 201. OAK SIDE DUMP.



No. 142. TRANSFER CAR.

THE ATLAS BOLT & SCREW CO.,

CLEVELAND, O., U.S.A.

MANUFACTURERS OF

STEEL BRICK DRYER CARS,

SMALL CARS OF ALL KINDS,

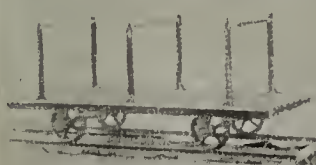
STEEL DRY KILN, LUMBER TRUCKS,

STRONG, LIGHT AND EASY RUNNING.

FULL LINE STEEL WHEELBARROWS.



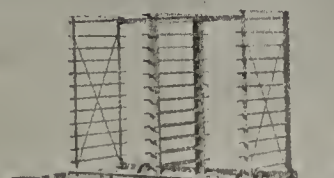
No. 124. DOUBLE DECK.



No. 126. O.O. STEEL DECK.



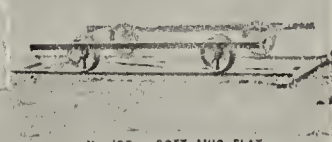
No. 136. 3 SECTION RACK.



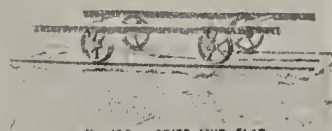
No. 133. SOFT MUD RACK.



No. 140. BOX SHOCKS, Etc.



No. 105. SOFT MUD FLAT.



No. 103. STIFF MUD FLAT.

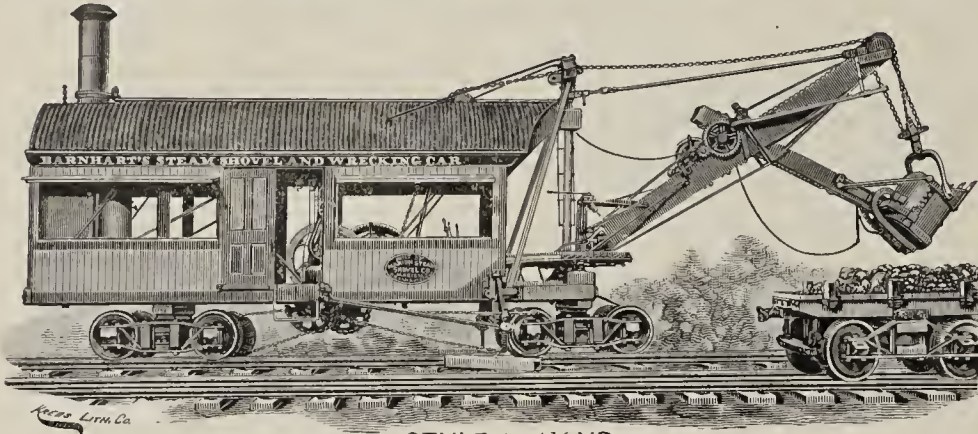


No. 108. FLAT, STEEL DECK.



No. 139. SHINGLES, STAVES, Etc.

Steam Shovels for Brickyards.



STYLE A—1½ YD.

We have in and around Chicago, about twenty of these machines of different sizes. We also have many elsewhere of different capacities. The accompanying cut represents our style "A" (1½ yd.) with a capacity from 700 to 1500 cubic yards per day, and our style "C" (¾ yd.) with a capacity of 350 to 700 yards per day. Our machines are simple and easy of operation and are a great saving to brickmakers and also enables them to make a better quality of brick, and they are always ready for work.

Write for testimonials and illustrated catalogue to

The Marion Steam Shovel Co.,

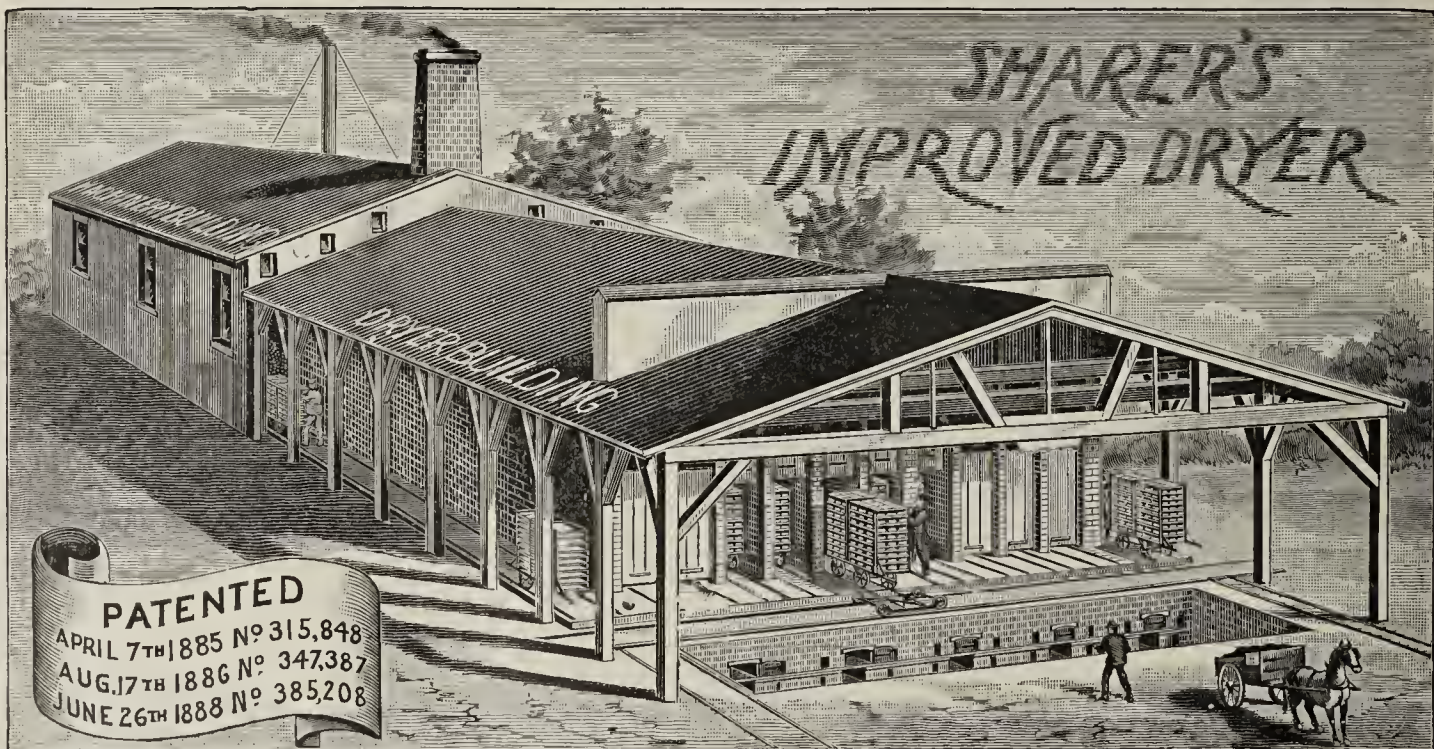
603 West Center Street, - MARION, OHIO.



STYLE C—¾ YD.

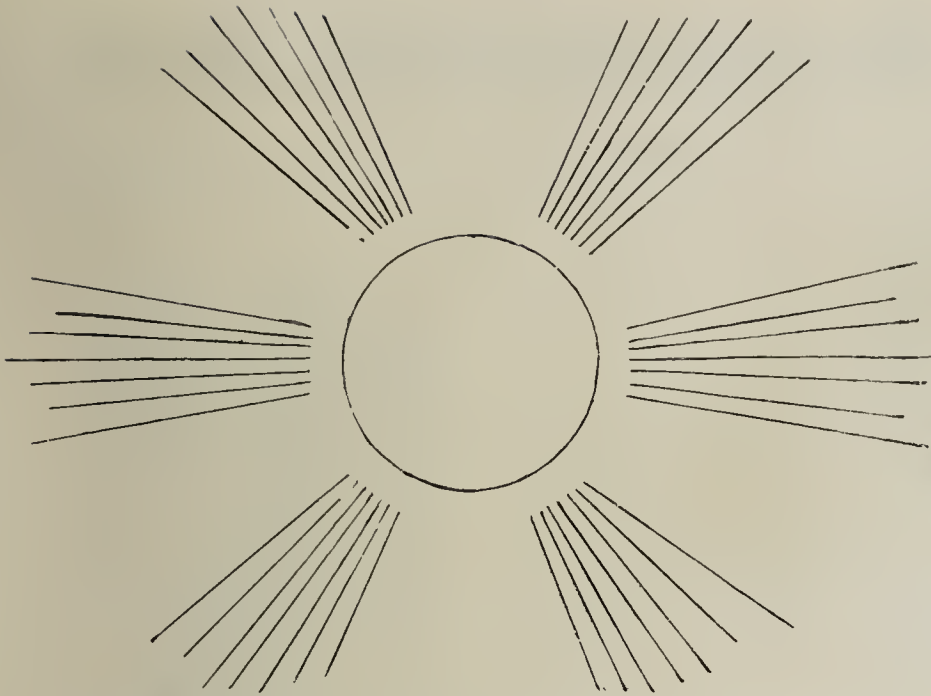
Geo. W. Sharer,

Brick Manufacturing Expert,
Constructing Engineer,
Contractor and Builder.



COMPLETE Dryer and Kiln outfits, and Complete Plants a specialty. Address

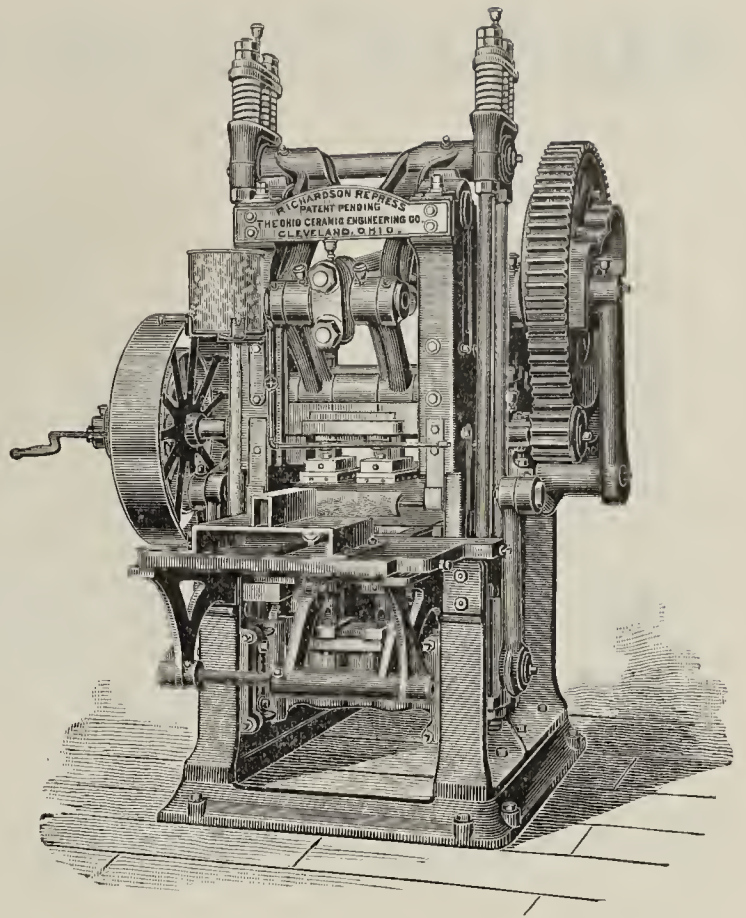
GEO. W. SHARER, 2224 Tioga, St. Philadelphia, Pa.



THE SUN

IS 91,500,000 miles from the Earth. If all

the intervening space was a Brickyard, and you wished to set up one of our Represses every hundred feet, you would have to order 4,831,200,000 machines. Of course that's impossible, but it isn't impossible for you to let us tell you about the most simple and serviceable Repress on the market.



The OHIO CERAMIC ENGINEERING CO., = = Cleveland, Ohio.

Brick Moulds at a Discount.

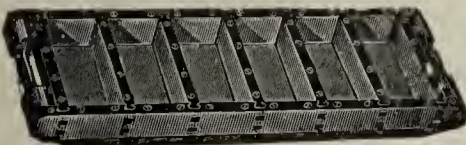
On and after June 1st, you can get 20 per cent off the list on Machine Moulds and other supplies, at reduced prices. If you have not got the LIST, send for it. Address the largest and most complete works of the kind in the world.



3 Brick Hand Mold.



6 Brick Hand Mold



6 Brick Machine Mold.

Moulds.

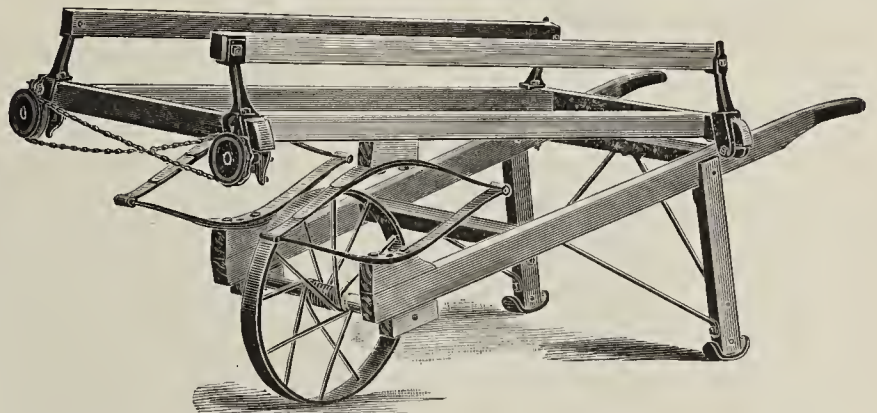
We make a specialty of moulds and have a good stock of the standard sizes on hand and can fill orders promptly. All odd sizes and shapes made to order on short notice.

Orders received now for future delivery. By giving your orders early you can have your moulds when you want them.

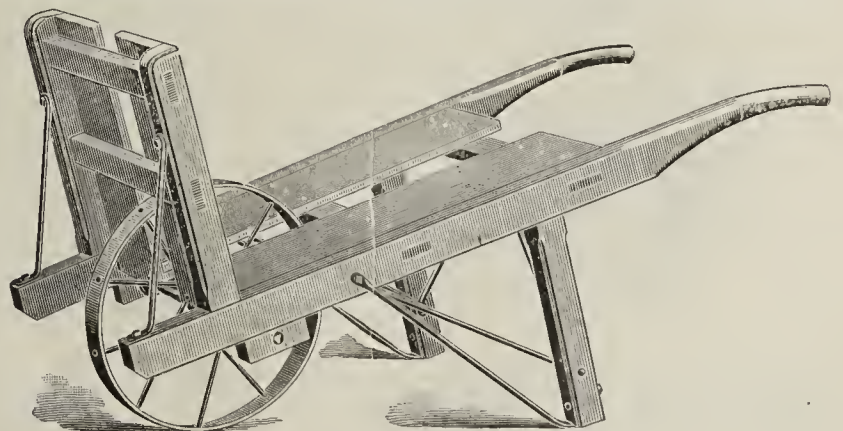
Please let us know what you will want, and the quantity of each kind, and you will get some interesting prices.

Send for catalogue and price list. Address,
D. J. C. ARNOLD, New London, Ohio.

TRUCKS. A great variety of Styles.



No. 4 Pallet Truck. Handiest and Best Truck in the market. For various purposes. Brick, Tile, Sewer Pipe, Sand, etc. All the best of their kind



No. 4 Brick Barrow.

The Best of all Recommendations.

... A DUPLICATE ORDER. ...

(COPY)

Office of HYDRAULIC PRESS BRICK CO.,

St. Louis, Mo., October 30th, 1897.

Milton F. Williams, Esq., City.

Dear Sir:--Enclosed please find our order No. 125 for one No. 2 Pulverizer. In a few days, or as soon as our drawings are completed, I expect to give you an order for two more. We have three of your Pulverizers now running, giving perfect satisfaction. We are able to grind Clay to any degree of fineness by making very slight changes in the machine. They have been running several months without repairs worth considering.

Yours truly,

HYDRAULIC PRESS BRICK CO.

W. N. Graves, Gen'l Supt.

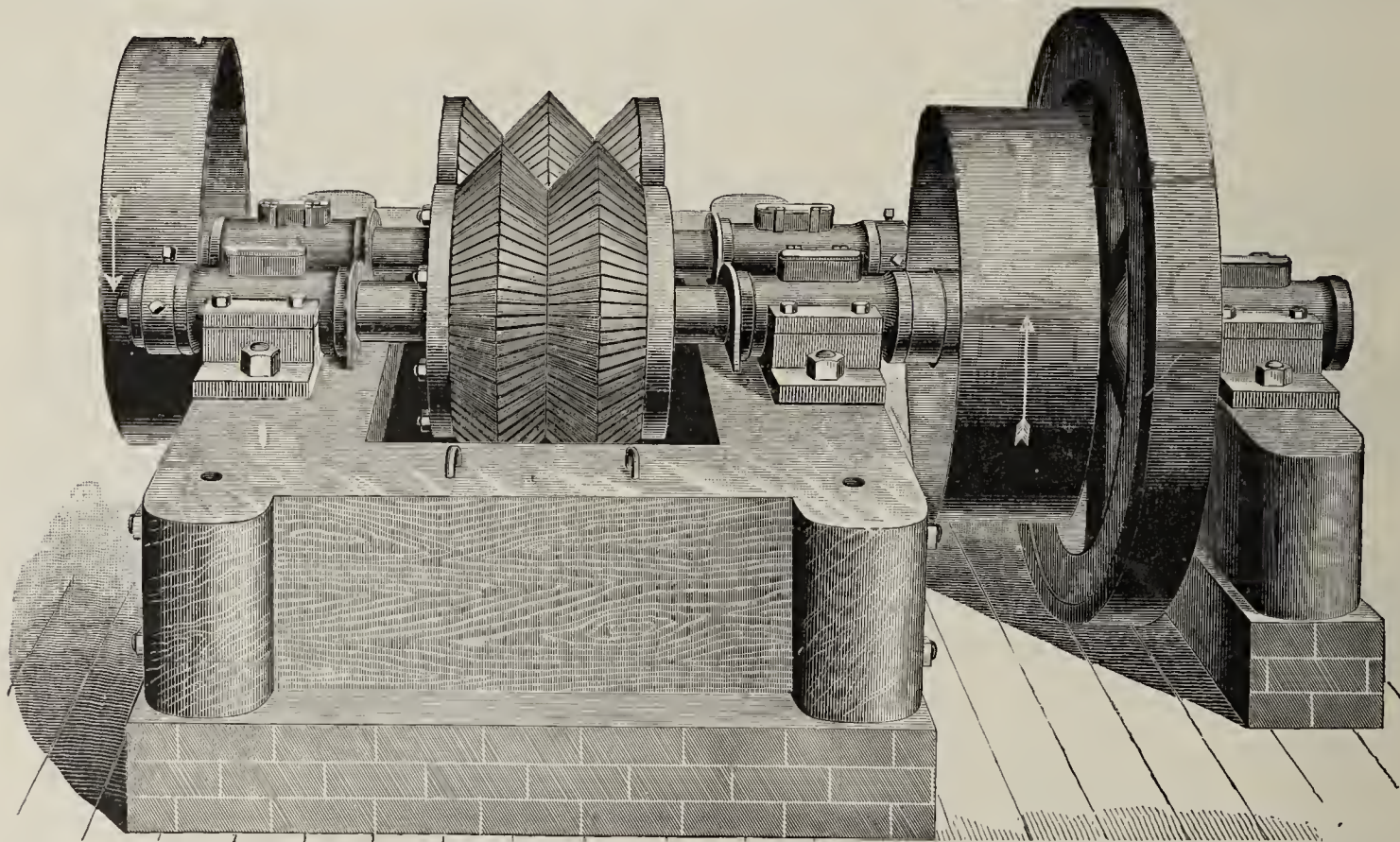
The above Company are using three of our Pulverizers, and have ordered three more, they state that in one of their St. Louis plants they are getting 210 tons of fire clay in 10 hours through one of our No. 2 extra Pulverizers. The Hydraulic Co. know a good thing when they see it, and are evidently making good use of same. Why not fall in line and do likewise?

The Williams Patent Crusher and Pulverizer Co., 2705 North Broadway, St. Louis, Mo.

Eastern Representative, GEO. W. BORTON, 700 Fidelity Bldg, Philadelphia, Pa.

NEWELL IMPROVED CLAY PULVERIZER

Heavy Cold Rolled Shafts Running in Best Anti-Friction Metal Bearings protected from dirt.

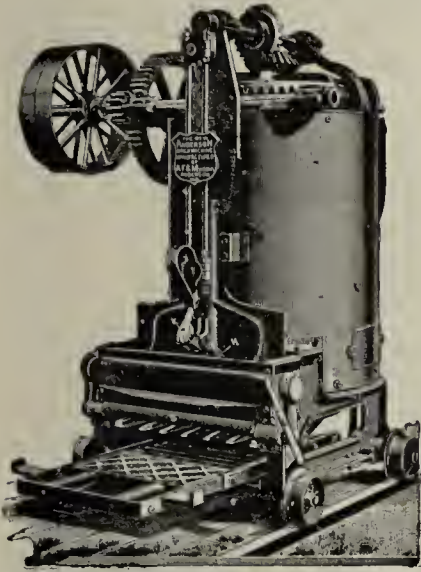


Our Clay Pulverizer grinds and prepares all clays used for manufacturing purposes thoroughly and economically, and is the only Mill in the market that will crush successfully clay containing stones, clay dogs, sulphur balls and other foreign substances, thus enabling manufacturers to make a first-class brick and saving the wastage of brick where these foreign substances are not ground. We also manufacture special Mills which thoroughly crush slate, which is being largely used for making bricks. Correspondence solicited.

NEWELL UNIVERSAL MILL CO., Room 710, Havermeyer Building, New York, U. S. A.
26 Cortland and 21 Dey Streets,

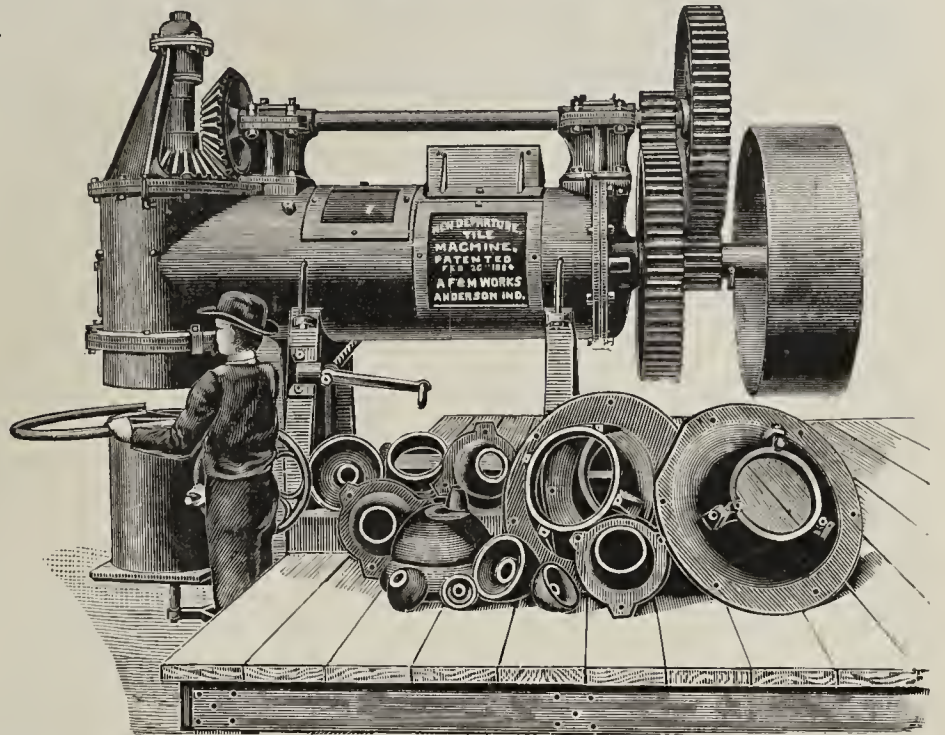
New Anderson Brick Machine.

Brick Machinery, Pug Mills, Disintegrators, Elevators, Moulds, Trucks and Barrows.



NEW ANDERSON BRICK MACHINE.
Steam Power.

Write
for
Catalogue
and
Prices.



NEW DEPARTURE TILE MILL.

The New Departure Tile Mill. The only mill for making Tile, Pipe and Hollow Ware, from 3 to 24-inch diameter. Vertical Delivery for large ware, Horizontal Delivery for small ware.

THE ANDERSON FOUNDRY & MACHINE WORKS,

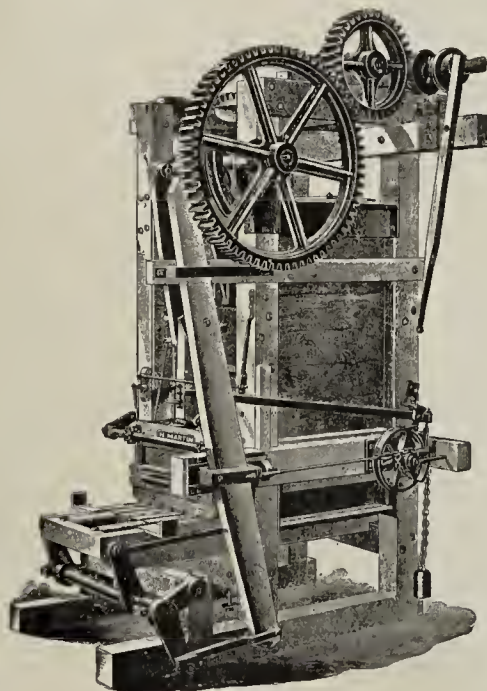
Anderson, Indiana

The "HENRY MARTIN" BRICK MACHINES

Are Manufactured ONLY

We carry in stock at all times
a large line of...

BARROWS,
TRUCKS,
MOULDS,
KILN CASTING and
General Brick Yard
Supplies.

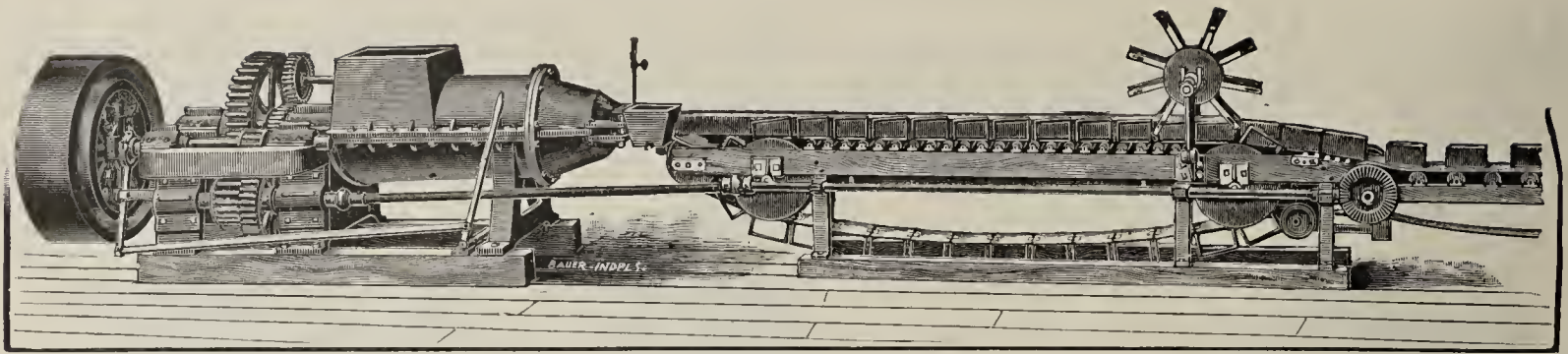


We are prepared to equip a
BRICKYARD complete,
and furnish the detail plans
for the entire construction
of the plant.

WRITE US for prices be-
fore purchasing elsewhere.

BY THE

HENRY MARTIN BRICK MACHINE MFG. CO., LANCASTER, PA., U. S. A.



DANVILLE, ILLS, August 12th, 1897.

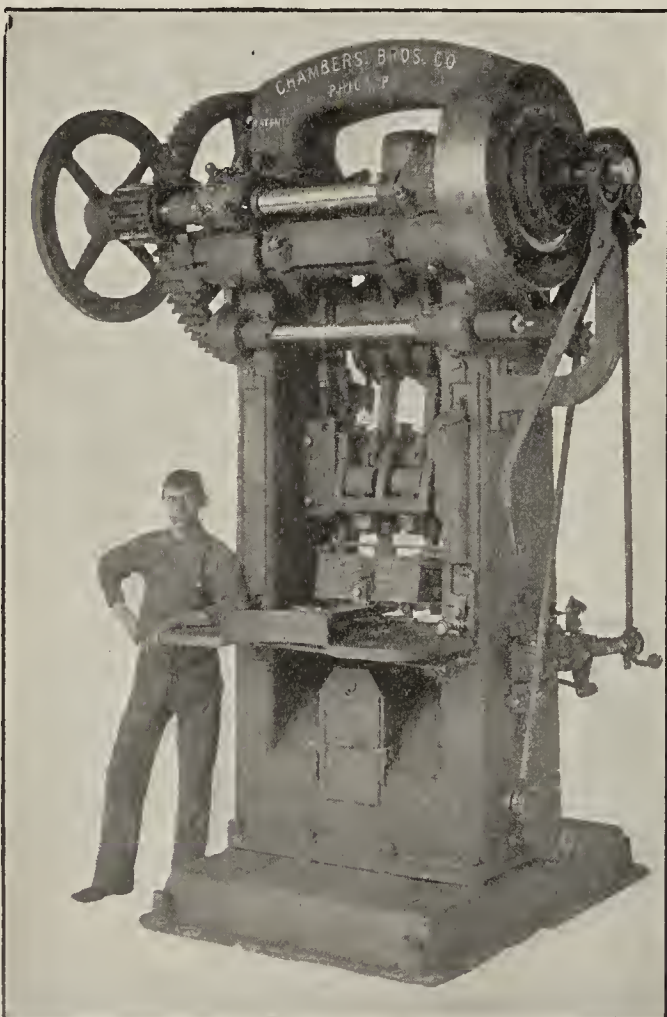
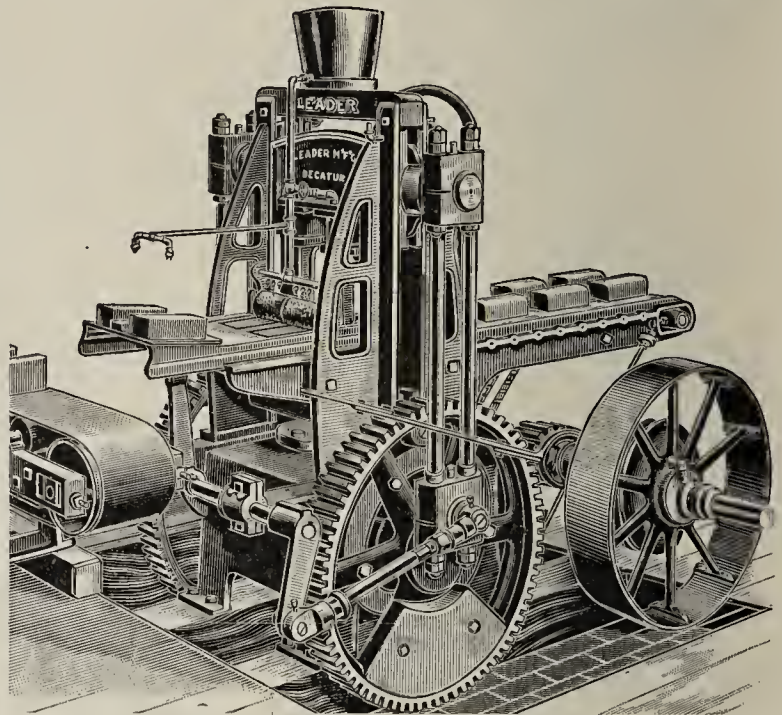
LEADER MFG. CO., Decatur, Ill.

Gentlemen:—We have been using two of your double power represses for nearly two years. Although the presses are in constant use (as we repress all of our product), we have had no trouble with them; both the quantity and quality of the work is entirely satisfactory. About three years ago we began with and used another make until we saw yours at work, when we substituted yours for the old ones, and we find we made a good investment. For strength, durability and simplicity we think THE LEADER RE-PRESS has no equal.

Yours truly, DANVILLE BRICK AND TILE CO.,
J. G. SHEA, President.

We have pleased several and can please you. Complete line of new, and bargains in second-hand machinery.

Leader Manufacturing Co.,
~~~~~Decatur, Ill.



## The Chambers Power Repress ...For Plastic Brick...

A STRONG, stiff, machine, with all the pressing machinery above the mould-box and away from the dirt. Steel-faced cams and hardened steel cam-rollers. Main shaft bearings made with long sleeves. Cross-head guides fitted with adjustable bronze gibs. The finished brick is delivered upon a plate, and is never touched by the incoming clot, which is placed in exact position and cannot be shaved. During the initial pressure any surplus clay in the clot is expelled, and all brick thus gauged to uniform thickness, following which all openings are closed and the finishing pressure applied in a practically tight box. The product is repressed, tempered clay brick, free from blemish arising from method of delivery, and of practically uniform density and thickness. The pressure applied to each brick can be regulated at will. Weight about 14,000 pounds.



Manufactured by **Chambers Bros.' Co.**  
Fifty-Second St. Philadelphia, Pa.  
Below  
Lancaster Avenue. U. S. A.





# Built Right

...AND...

# Run Right.

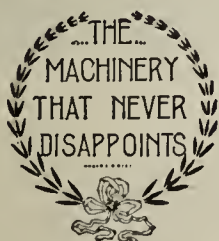


## '98

The first of the new year is not far off; January First is the day for the turning of a new leaf. The new year has more of promise to the clay worker than any season for years. In turning over a new leaf among your good resolutions, you will find none better or more profitable than to resolve to equip your plant with our superior, money-making machinery. People who have used it, say emphatically there is no superior and few equals in our line. Start the good resolution at once by dropping us a line of inquiry.

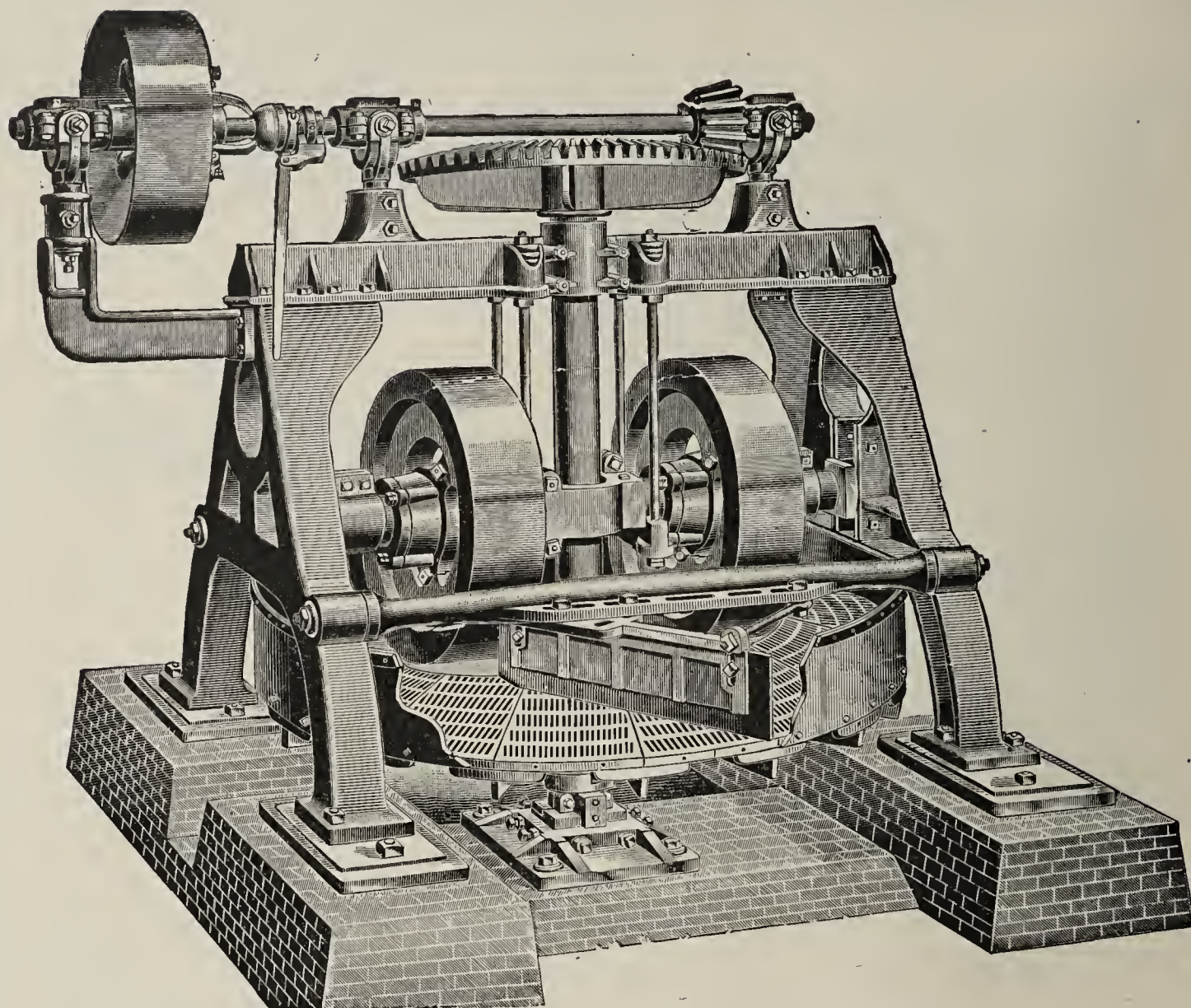
Wishing you a Merry Christmas and a Prosperous New Year, we are  
Yours for the Best Machinery,

## The American Clay- Working Machinery Co.,



BUCYRUS, OHIO,  
U. S. A.



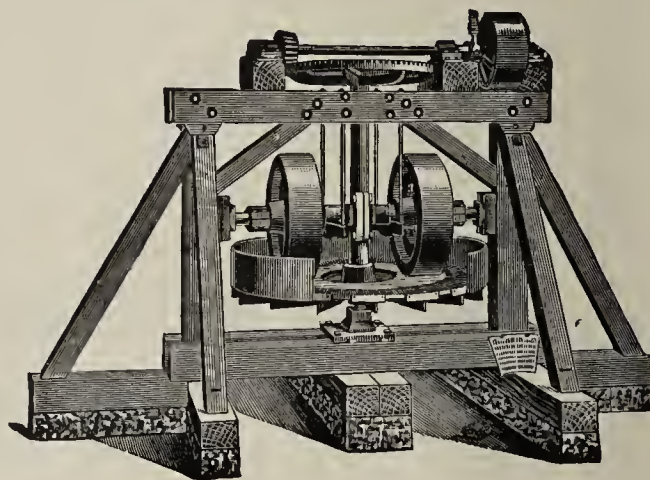
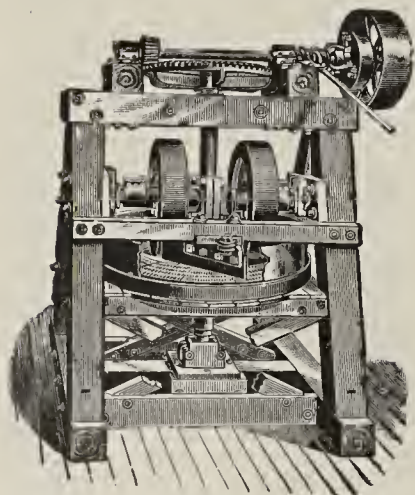


OUR SPECIALTY IS

**DRY PANS.**

IRON FRAMES,  
WOOD FRAMES.

~~~~~  
All Sizes and Price
to suit
Any Size Plant.
~~~~~



.....SEND FOR NEW ILLUSTRATED CATALOGUE.....

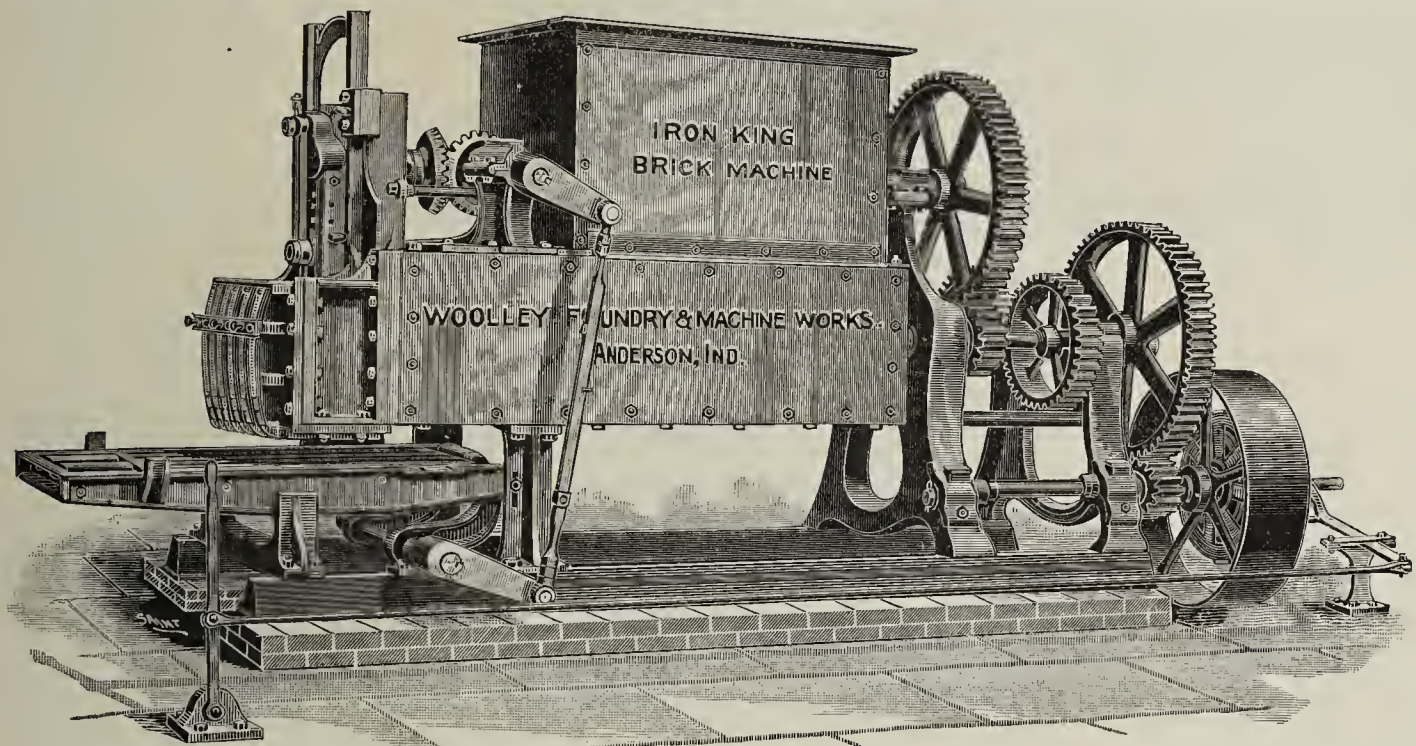
**FROST ENGINE CO.,** Galesburg, Ill.,  
U. S. A.



# SUCCESS.



IF nothing succeeds like success, Brickmakers should be very careful not to buy any but successful machinery. That is the only kind we make; any and every machine that bears our name is guaranteed to be successful and our guarantee is **good**.



A Brick Machine that Never Made a Failure.

Our “**IRON KING**” Brick Machine is made on correct mechanical lines and of material that will “stand the racket” right through the season. No need to stop for repairs where this machine is used. The same is true of all our machinery.

**WOOLLEY** DRY PANS,  
PUG MILLS,  
SLIP PUMPS  
and PRESSES

Are all made for hard service If you want successful Brickmaking Machinery, Tile or Pottery Manufacturers' Supplies, don't fail to write us.

IT WILL AFFORD US  
PLEASURE TO QUOTE  
YOU PRICES. . . .

Mention the Clay-Worker.





# Good Opinion

Of an Ex-President of the N. B. M. A., and "Brickmaker to the President of the U. S."

This letter is only one of many received of the kind. Once you have used a **POTTS HORIZONTAL STOCK BRICK MACHINE**, you would not use any other if it were given to you.

OFFICE OF  
**ADAMS BRICK CO.,**  
Builders Exchange.

**Manufacturers of Building, Sewer and Paving Brick.**  
Made from Shale or Clay.

WORKS:--Martinsville, Ind.

Indianapolis, Ind., Oct. 5th, 1897.

C. & A. Potts & Co.,

Gentlemen:--You may enter our order for one of your all iron horizontal stock brick machines; one No. 2 "A" disintegrator; one mold sander and one belt elevator. The outfit herewith ordered is to be used at the plant we are now constructing at Martinsville, thirty miles southwest of Indianapolis on the I & V branch of the Pennsylvania Railroad, the same to be furnished at your earliest convenience. While engaged in the manufacture of brick at Sheridan, Ind., we used two of your horizontal soft mud machines for several years, which gave us very satisfactory results, in the facility and ease with which we operated them, as well as the character of the product they turned out. Therefore, in awarding your firm this contract, we feel justified in expecting a first-class equipment, which will make a brick from our clay and shale equal in every respect to any produced in the country. As you well know, we have had the erection of this plant in contemplation for several months, and for the purpose of securing the best, most substantial and most easily operated soft mud machines, we have visited many of the largest and best equipped yards of the central West, and after a thorough examination of the several horizontal machines which we saw in operation, I can say without prejudice that we are confirmed in the belief that your all iron brick machines is the BEST in WORKMANSHIP, SIMPLICITY and WEIGHT of those which I saw.

Very truly yours,

ADAMS BRICK CO.

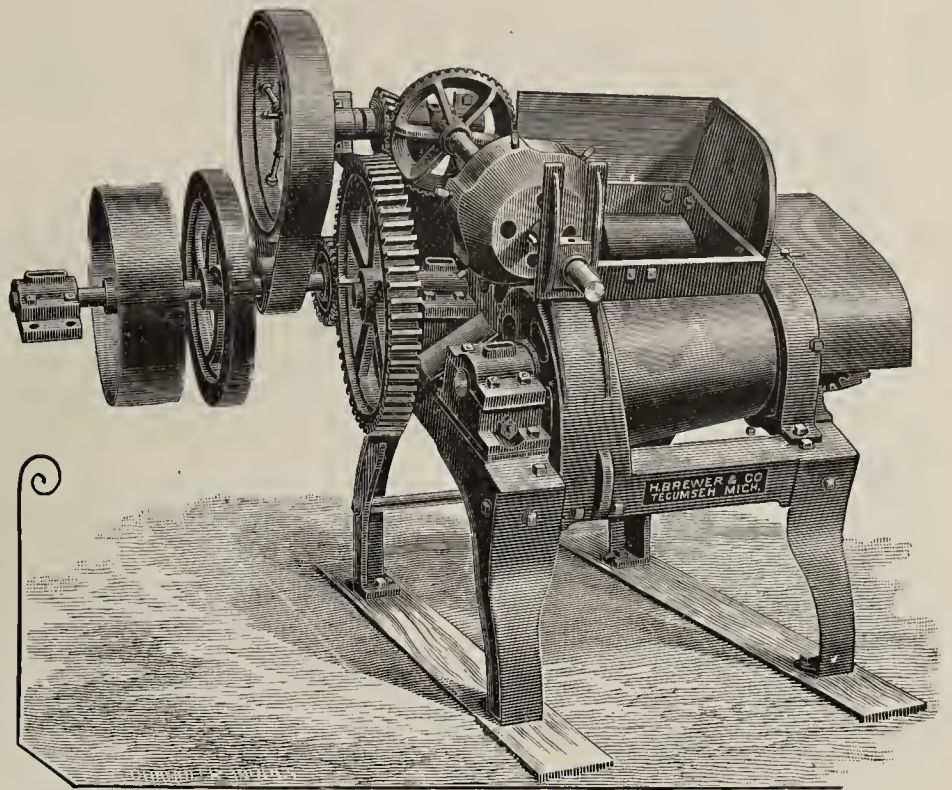
J. C. Adams, President.

You will make no mistake when purchasing a brick machine, if you place your order with C. & A. Potts & Co. Their machinery has stood the test and is now in use on the largest and best equipped plants in the United States. Write for prices and terms.

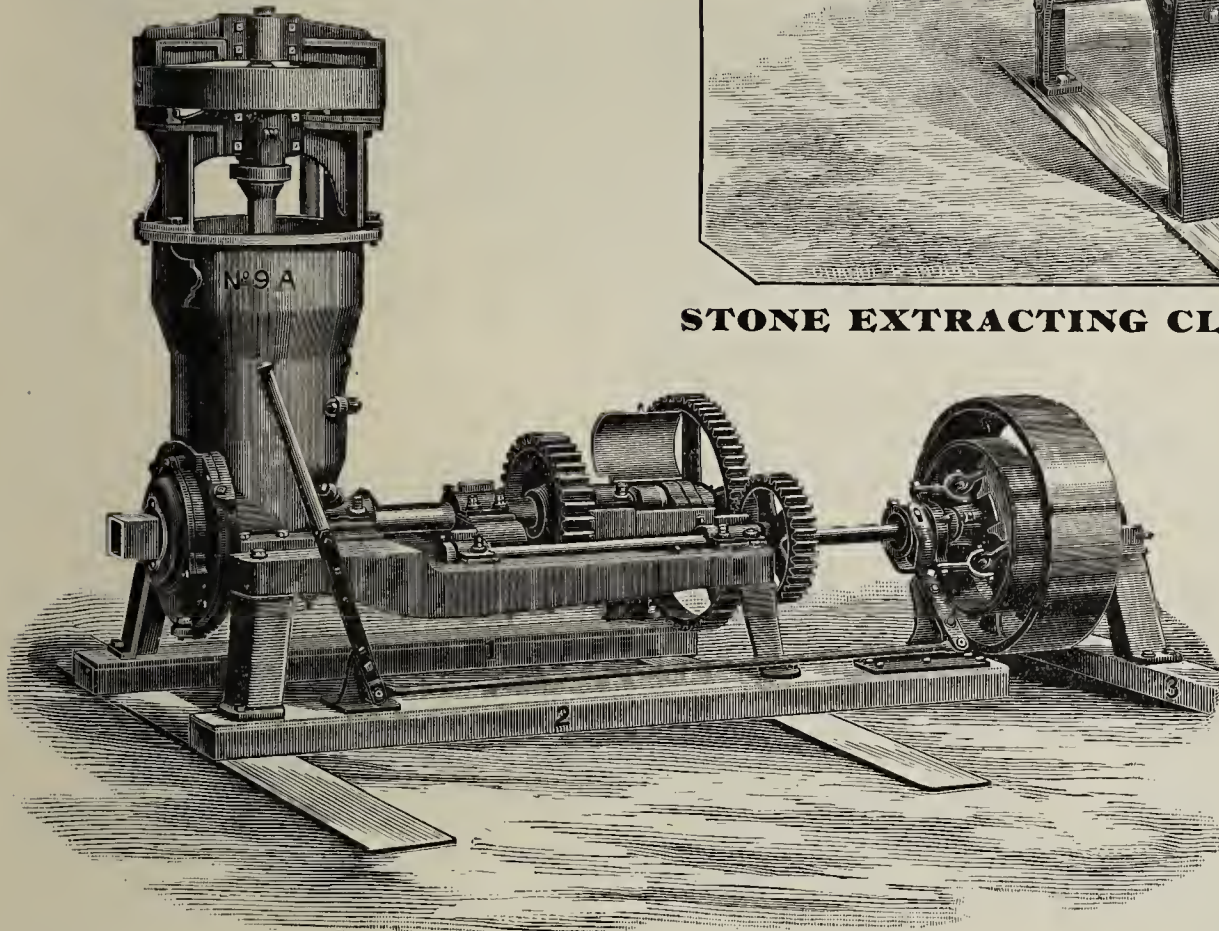
**C. & A. POTTS & CO.,**  
816-828 West Washington St., INDIANAPOLIS, IND.



# Clay . . . . Working Machinery



**STONE EXTRACTING CLAY CRUSHER.**



**No. 9 "A" BRICK MACHINE.**

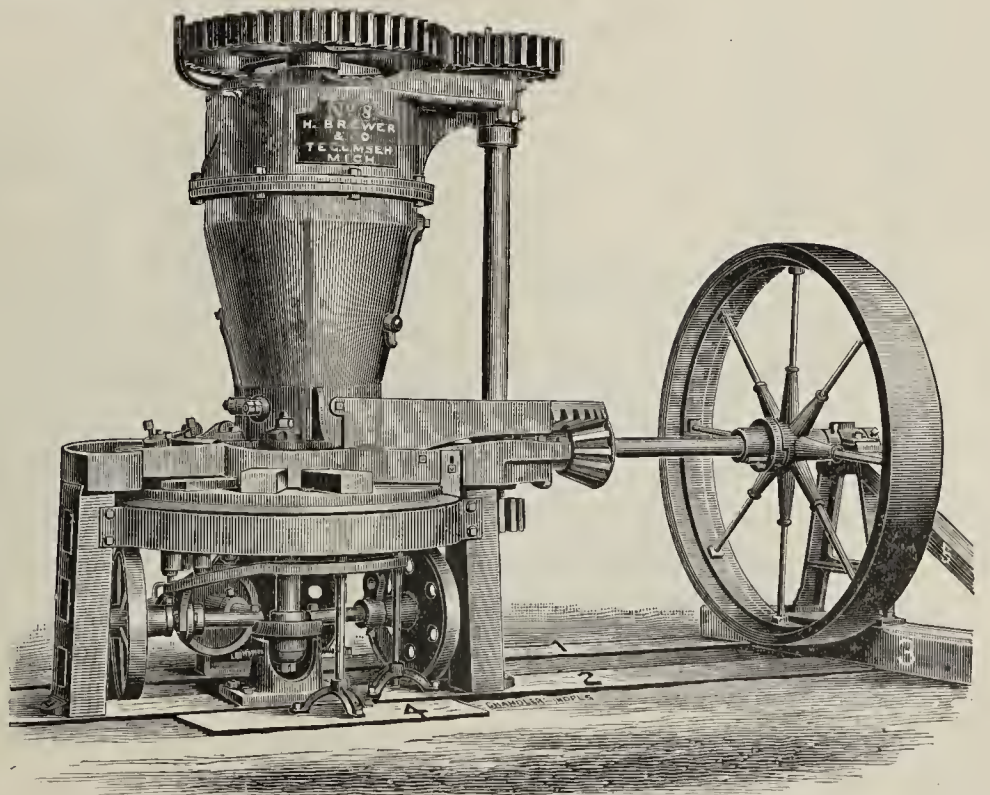
Complete  
Brick  
and  
Tile  
Outfits  
a Specialty.



*Manufactured by*

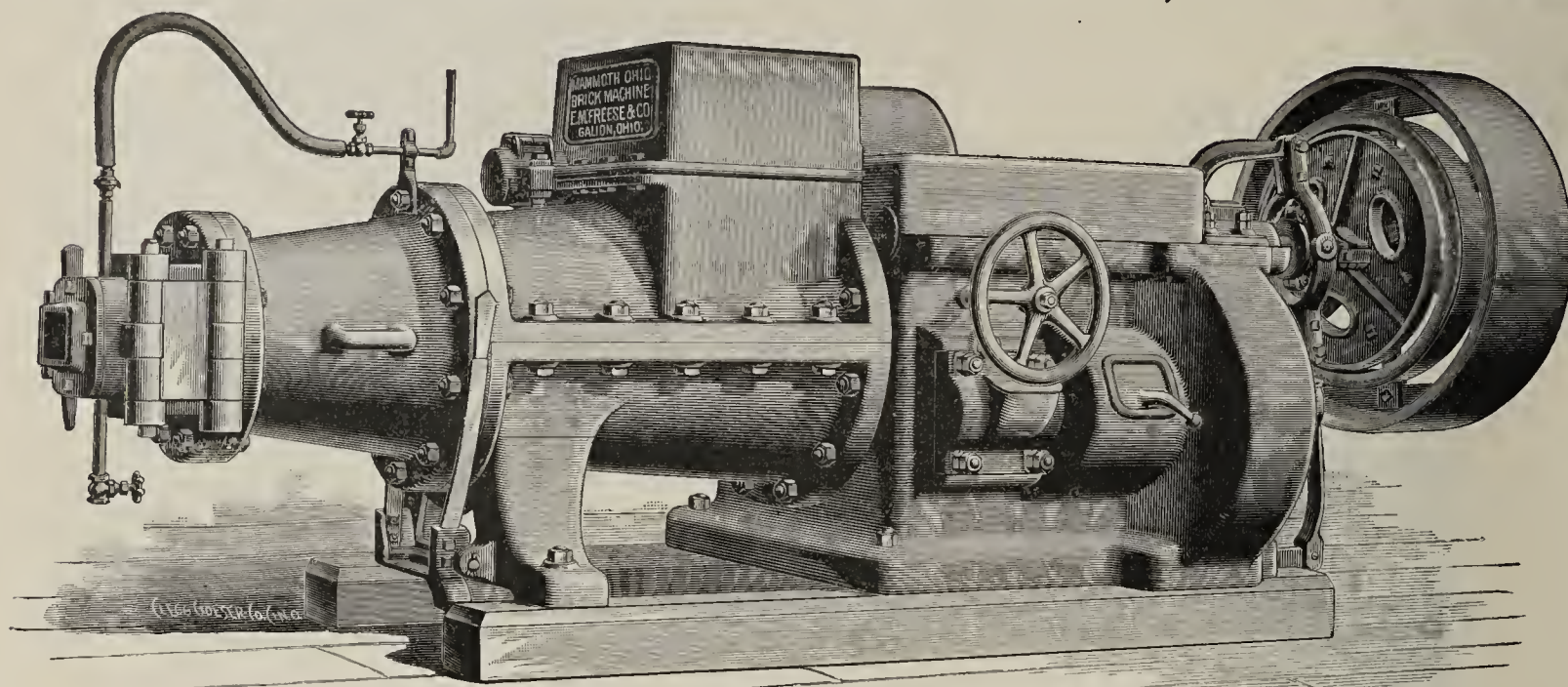
## H. Brewer & Co.,

**TECUMSEH,  
. . . . MICH.**

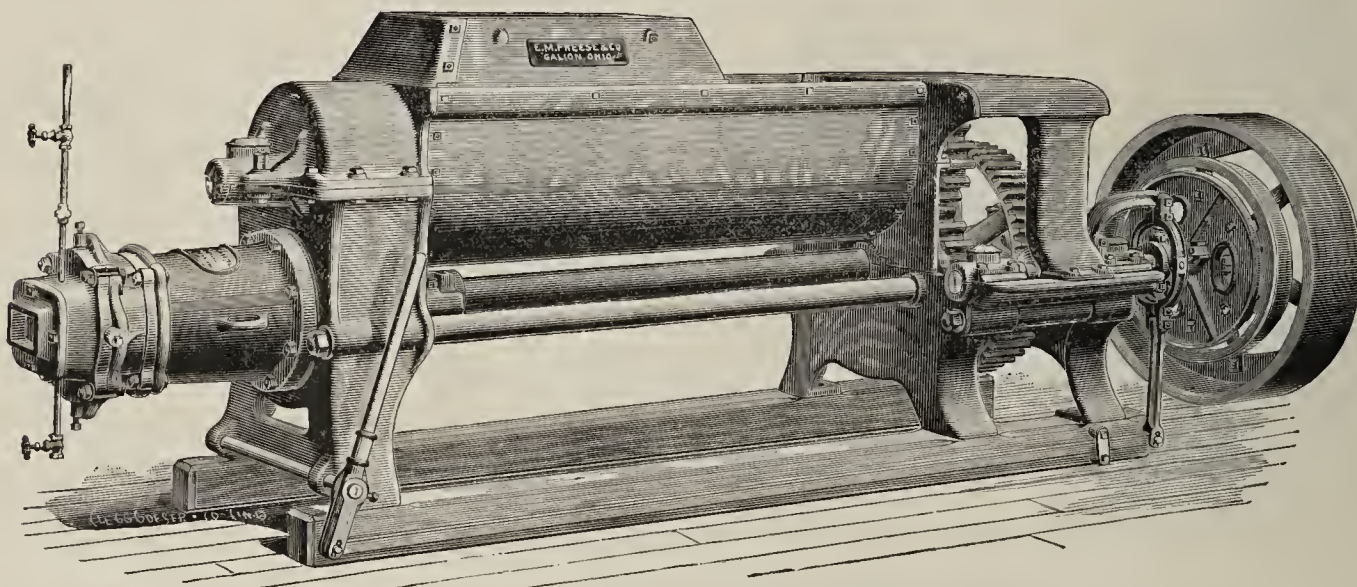




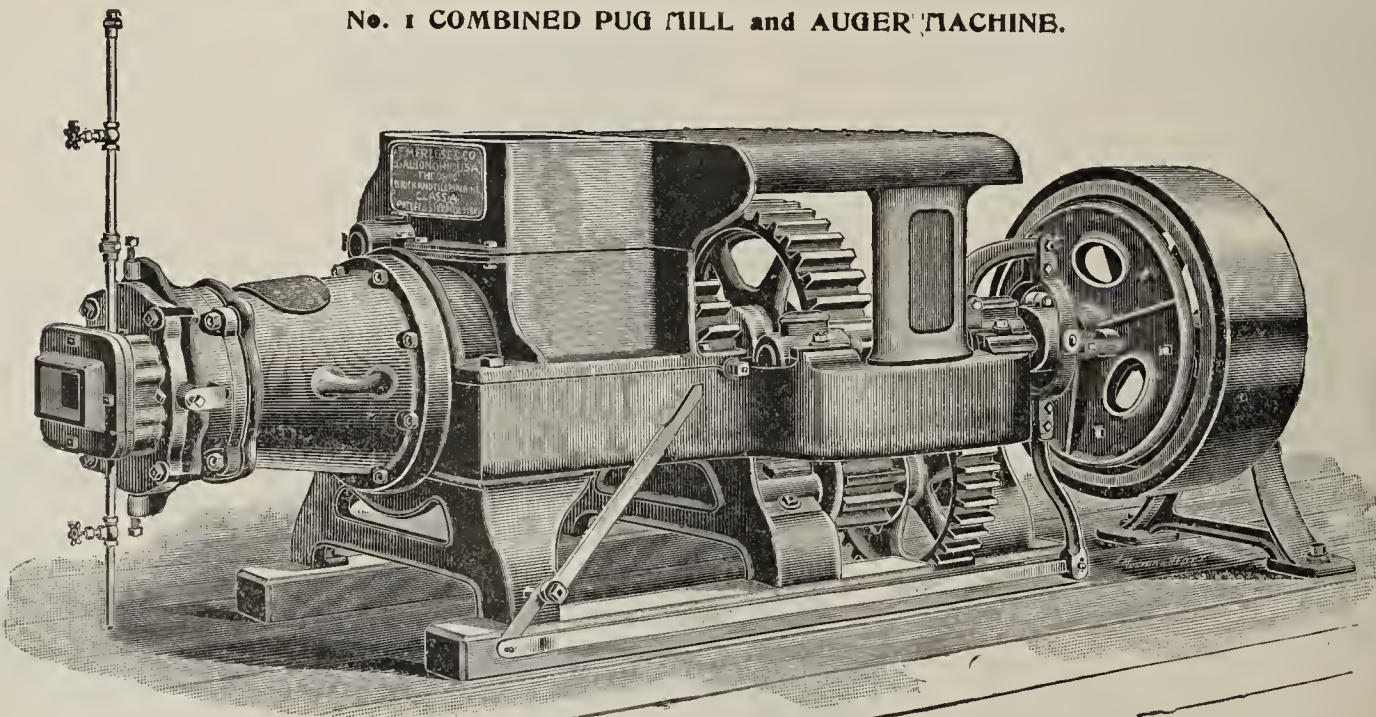
# E. M. FREESE & CO., GALION, OHIO.



MAMMOTH BRICK MACHINE.



No. 1 COMBINED PUG MILL and AUGER MACHINE.



IMPROVED "A" SPECIAL OHIO BRICK MACHINE.

Send for 136 page Catalogue.



# How Many Hands Do You Employ?

**I**T DOESN'T MATTER whether you employ one or one hundred hands we can save you money and increase your capacity. It is false economy to delay the improvement of your plant. Don't continue to make 35,000 brick a day, when you can increase your capacity to 50,000 with less trouble, less expense and less time. Suppose we increase your output 5,000 a day—that's a low estimate and isn't near what we have done or can do—in a week you are 30,000 brick ahead, which, at \$5 a thousand would be \$150 to your credit in the bank, the saving of a week. But it wouldn't stop at that; the saving would continue from week to week, and month to month. You would make better brick and your reputation would spread. You would get orders which you might not otherwise have had a chance at. Then you could speed your machinery up to 75,000 or 100,000 per day. Prosperity, long delayed, is at your door, must it knock in vain?

Write us about machinery or appliances for manufacturing clay products, we make them all and we make the best kind.



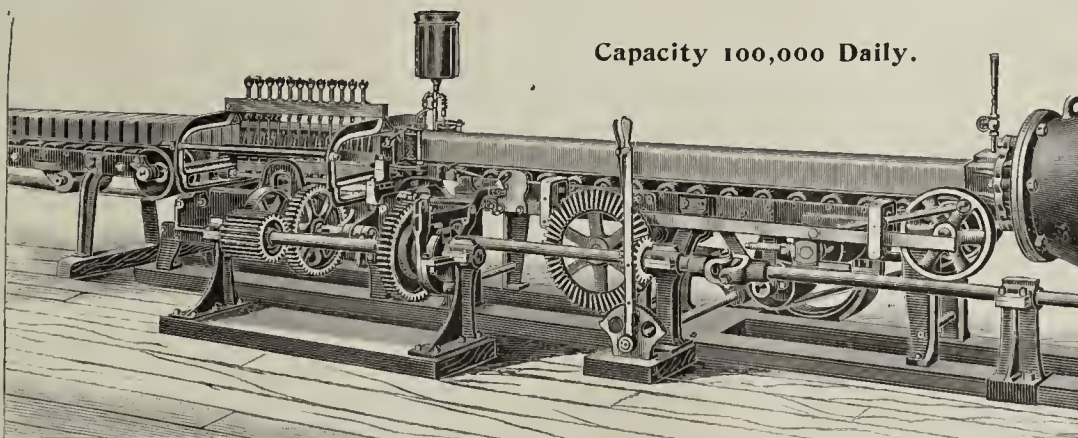
**The American  
Clay-Working Machinery Co.,**

**Bucyrus, Ohio, U. S. A.**



**NEW YORK  
OFFICE:**

**39 and 41  
Courtland  
Street,  
Room 103.**





# After Eight Years Service

Still in Good Shape, . . . . .  
No Stops Because of Breakages.

SOUTHOLD, N. Y., October 8, 1897.

THE EASTERN MACHINERY Co.,  
New Haven, Conn.

Gentlemen:—Replying to your favor of 29th ult., I would say, our “New Haven” Brick Machine is in good shape and doing good work. We have not had to stop this season through any breakage of the brick machine.

I have come to the conclusion that a horizontal brick machine mixes the mud more thoroughly and evenly than an upright machine possibly can, and therefore produces brick which are more uniform in size and quality.

Wishing you success I remain

Very truly yours,

C. L. SANFORD.

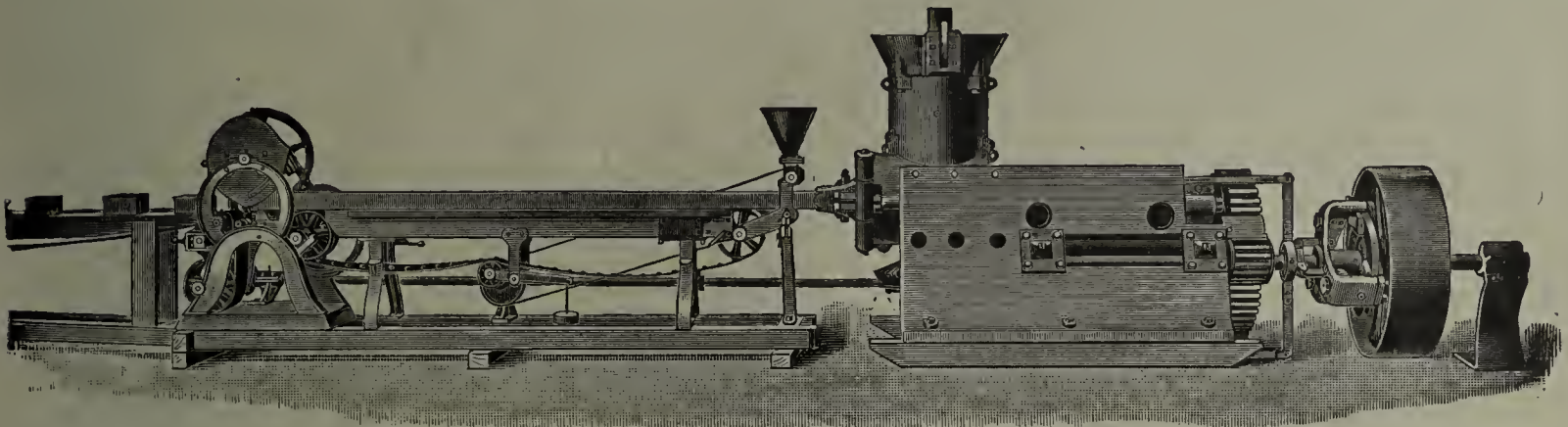
We have similar reports from all “New Haven” Machines.  
Let us tell you about them. . . . .

## The Eastern Machinery Co.,

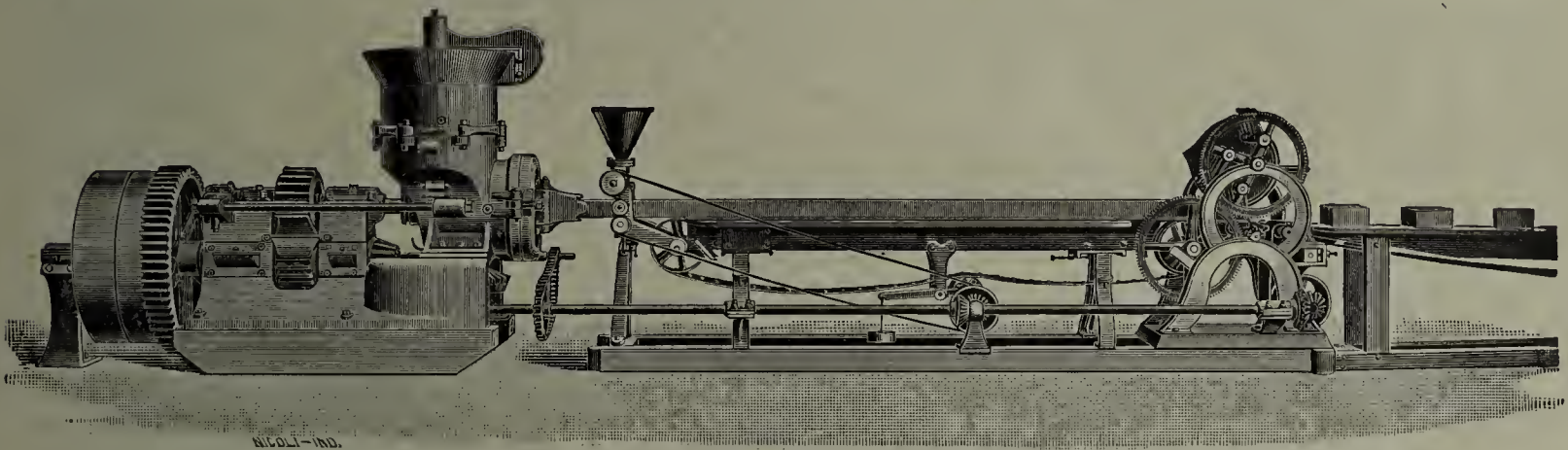
NEW HAVEN, CONN.



# WONDER MACHINERY.

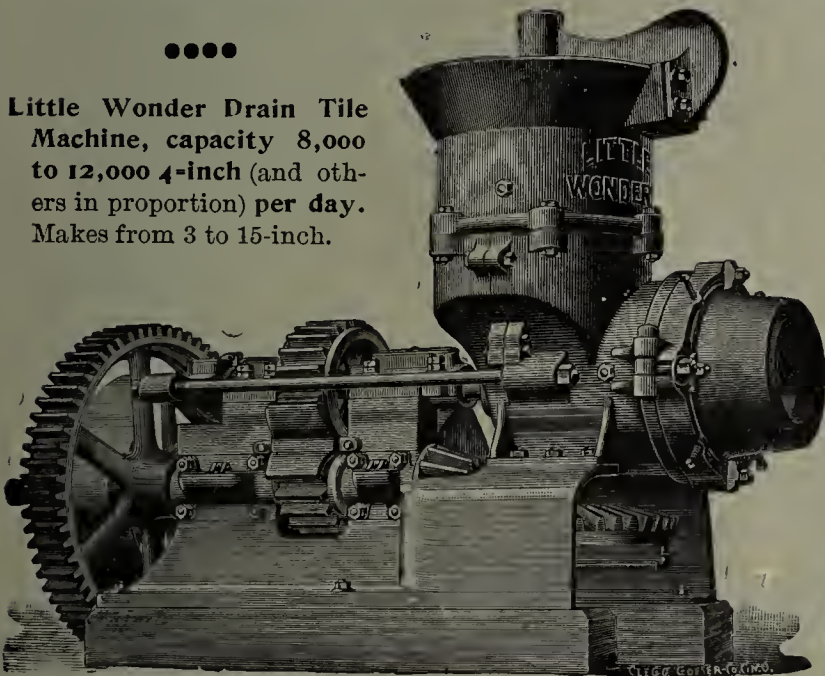


Big Wonder Brick Machine with Cunningham Automatic Brick Cutter and Sander; Capacity, 50,000 to 60,000 Brick per day.

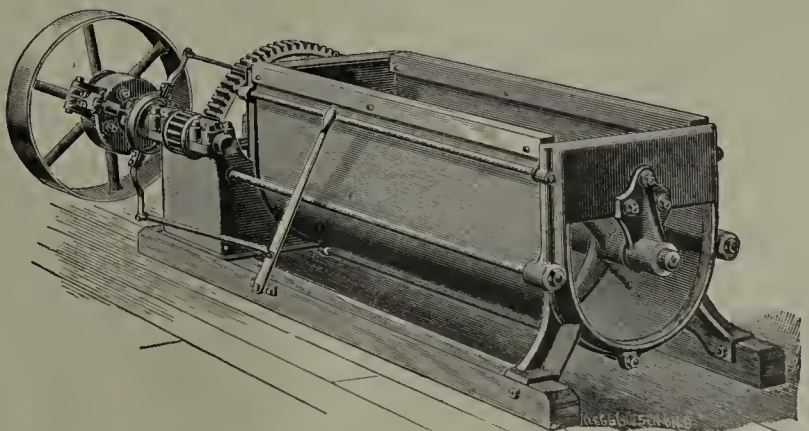


Little Wonder Brick Machine, with Cunningham Automatic Brick Cutter and Sander; capacity 25,000 Brick per day.

Little Wonder Drain Tile Machine, capacity 8,000 to 12,000 4-inch (and others in proportion) per day. Makes from 3 to 15-inch.



THE WONDER BRICK MACHINES have a Great Puging Capacity, therefore, less lamination in the brick. Guaranteed to run with less power and require less repairs, hence, they are "MONEY SAVERS" and MONEY MAKERS."



Open Top Pug Mills. Ranging from 25,000 to 100,000 Brick daily capacity.

MANUFACTURED BY

The Wallace Mfg. Co.,  
Frankfort, Ind.

CHICAGO AGENT:

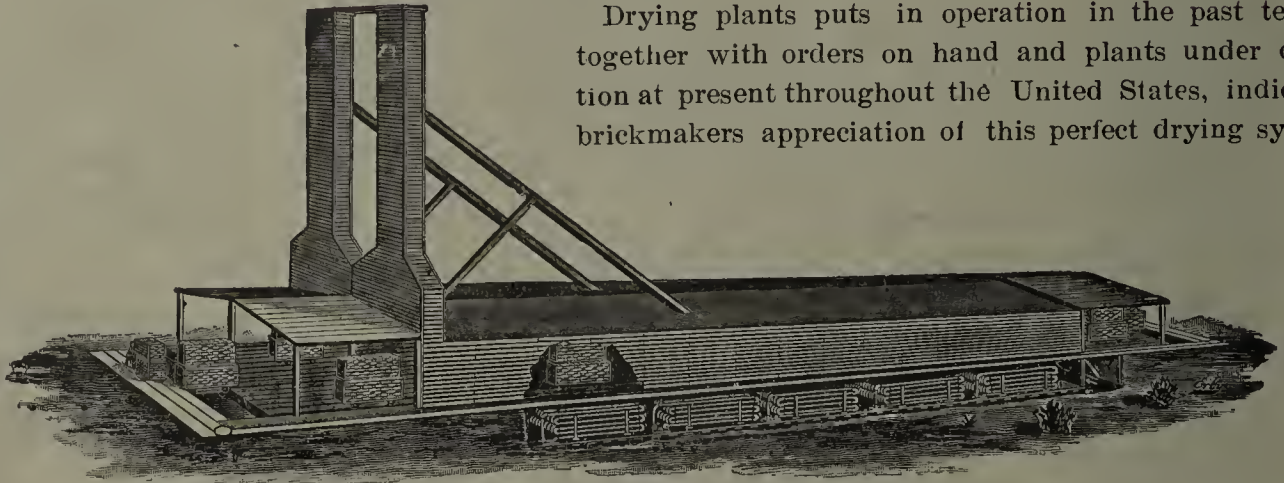
Chicago Brick Machinery Co., Chicago, Ill.

Catalogue Free.



# Iron Clad Dryer.....IN THE LEAD

Guaranteed to dry soft mud—stiff mud—dry-pressed brick and tile free from white-wash, disintegration or other injury with rapidity and economy.



Drying plants puts in operation in the past ten years, together with orders on hand and plants under construction at present throughout the United States, indicates the brickmakers appreciation of this perfect drying system.

•→•SEE WHAT THEY SAY:•←•

WM. SANKEY, THOS. SANKEY,  
WM. E. SANKEY, F. M. SANKEY,  
T. H. SANKEY, J. F. SANKEY.

CAPACITY: 40,000 BRICK PER DAY.

TELEPHONES: { OFFICE, S. S. 11-3.  
WORKS, S. S. 11-2.  
WORKS, E. E. 589

## SANKEY BROS., BRICK.

ORNAMENTAL PRESSED, SELECT STOCK, BUILDING, PAVING AND GUTTER BRICK.

SPECIAL AGENTS FOR MARTIN'S IMPROVED BRICK MACHINE.

RAILROAD SHIPPING A SPECIALTY.

OFFICE: 2101 Carson Street.

WORKS: Head of 18th Street, S. S.  
Penn and Atlantic Aves., E. E.

PITTSBURGH, PA., May 3, 1897.

WOLFF DRYER CO., Chicago, Ill.

Gentlemen:—Replying to your inquiry regarding dry house at our east end plant, will say, that it is two years since we equipped that yard. We found the earthy deposit there would make the best quality of stock brick; soft mud process, but would not stand direct heat drying; such as we were accustomed to use, therefore concluded to test this brick in your dryer, resulting in our installing your system, producing results of a most satisfactory nature, proving the excellence and correctness of your system of absorbing moisture from centre to surface by drawing a volume of warm air through the brick, carrying off the moisture and leaving our brick perfect and bone dry, saving us money in burning and producing beautiful color.

Six months experience proved to us that it would pay to install your system at our South side works, which we did one year ago, with equal satisfaction. At this yard, we have shale clay manufacturing soft mud and dry-press brick and was equipped with the best kind of dry floor, heat supplied from natural gas; we sacrificed this and built an Iron-Clad under the same roof. This loss has been our gain; the quality of brick and saving in cost of drying enables us to show a fair profit, which is very pleasing, considering prevailing low prices for brick. We dry all our dry-press brick before setting in the kiln.

Respectfully yours,

SANKEY BROTHERS.

INFORMATION, ESTIMATES, CATALOGUES CHEERFULLY FURNISHED.

## WOLFF DRYER CO.,

358 Dearborn St., Room 303.

CHICAGO, ILL.























